JUNIPER RIDGE LANDFILL

EXPANSION

OPERATIONS MANUAL

MEDEP LICENSE #S-020700-7A-A-N,

AMENDMENT #S-020700-WD-N-A, &

MEDEP LICENSE #S-020700-WD-BI-N

Revised April 2026, 2025, 2024, 2023, 2022, 2021, and 2020

Original submitted with the
JRL Expansion Application
(July 2015)

JUNIPER RIDGE LANDFILL

Operated by NEWSME Landfill Operations, LLC

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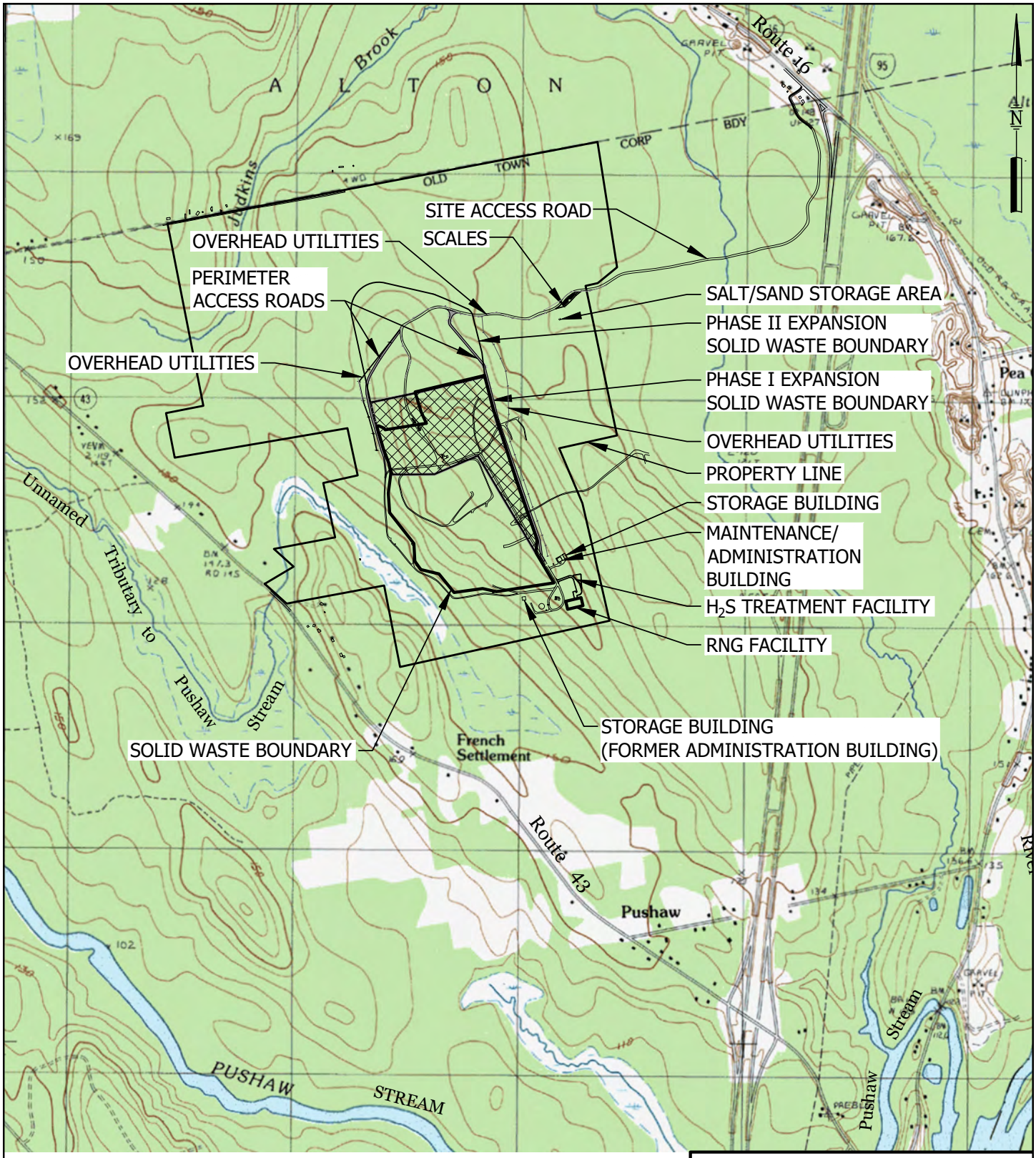
JUNIPER RIDGE LANDFILL EXPANSION
OPERATIONS MANUAL

1.0 INTRODUCTION

This document serves as the current Juniper Ridge Landfill (JRL) Expansion Operations Manual (Manual), an amended version of the JRL Expansion Application Volume IV Operations Manual, submitted as part of the JRL Expansion Application to the Maine Department of Environmental Protection (Department) on July 21, 2015, and approved by the Maine Board of Environmental Protection (Board) on June 1, 2017. Amendments to the Manual were made to reflect current operations, pursuant to 06-092-CMR 401.2.L of the Maine Solid Waste Management Rules (Rules). Both the originally permitted JRL and the approved JRL Expansion (Expansion) are located off Route 16 in Old Town, Maine (Figure 1-1) and are owned by the Maine Bureau of General Services (BGS) and operated by NEWSME Landfill Operations, LLC (NEWSME), a subsidiary of New England Waste Services of ME.

Landfill operations at the JRL are regulated pursuant to the Rules, Chapters 400, 401, and 405 administered by the Maine Department of Environmental Protection (MEDEP). Both the originally permitted JRL and the Expansion are licensed by the MEDEP. A listing of JRL MEDEP operating permits may be found in Appendix A. Copies of JRL permits are kept on file in NEWSME's Environmental Compliance Manager's (ECM) Office and are available for viewing during normal business hours.

06-092-CMR 401.4.A of the Rules requires NEWSME to update this Manual on an annual basis to reflect changes that occur during the landfill licensing and construction process and to reflect the current operational practices at the JRL facility. The last update was completed in April of 2026, which supersedes previous updates made in 2025, 2024, 2023, 2022, 2021, and 2020. In 2020 a re-issue of new certified copies, were submitted along with the 2019 Annual reports. Certified copies of the Manual now address operations of both the originally permitted JRL which included approximately 68 acres, and the Expansion which expands the landfill solid waste boundary by 54 acres. A majority of the previous operating policies and procedures will remain the same during the development of the Expansion cells. However, changes have been made to portions of the Manual which have changed as a result of the Expansion. For example, the cell development plans contained in this document are for the Expansion cells.



NOTE:

BASE MAP ADAPTED FROM 7.5 MIN USGS TOPOGRAPHIC QUADRANGLE OLD TOWN, MAINE-1988

1000 0 2000 4000 FEET

DWG: SITELOC LMN: SITELOC CTB: SME-STD REV: 2/11/2025

FIGURE 1-1
SITE LOCATION MAP
JUNIPER RIDGE LANDFILL EXPANSION
OLD TOWN, MAINE

SME
SEVEE & MAHER ENGINEERS

\\Nserver\cfs\Casella\OldTownLandfill\GeneralSiteInfo\OM\2024\ACAD\Figures\SITELOC.dwg, FIGURE, 2/11/2025 2:16:46 PM, sjm

Detailed development plans Cell 11, 12, 13,14, 15, and 16 of the Expansion's cells, are included in Appendix D. Cell 11 was constructed in 2018, Cell 12 in 2020, Cell 13 in 2021, Cell 14 in 2022, Cell 15 in 2023, and Cell 16 in 2024. Cell 17 is scheduled for construction in 2026. Unless otherwise specified, references in the Manual to JRL or the landfill should be deemed to include both the originally permitted landfill and the Expansion.

1.1 Site History

The JRL was originally owned and operated by Fort James Operating Company (Fort James) (formerly known as James River Paper Company) and subsequently by Georgia-Pacific Corporation (GP).

The landfill has been designed and constructed as a secure waste disposal facility in that the groundwater beneath and adjacent to the site is protected by a composite liner and a leachate collection system for the originally permitted JRL cells and a double liner system with a leak detection system for the Expansion cells. Leachate generated at the site is collected, stored, and transported to the ND OTM LLC (ND Paper) wastewater treatment plant located in Old Town for treatment. Additionally, JRL utilizes Anson-Madison Sanitary District as a backup disposal site, as needed.

The JRL was originally operated by Fort James/GP between December 1996 and February 2004. On February 5, 2004, the operating licenses of the JRL were transferred to the Maine State Planning Office (SPO) as part of a purchase and sales agreement between the State of Maine and Fort James/GP. On February 5, 2004, the State of Maine through the State Planning Office also finalized an operating services agreement with NEWSME for the operation of the JRL.

The facility was originally permitted for the disposal of pulp and papermaking residuals from the Fort James/GP's Old Town mill (primarily wastewater treatment plant sludge), bottom ash from Lincoln Pulp & Paper, and burn pile ash from the City of Old Town transfer station. In addition to the waste streams historically disposed of at the landfill, the landfill is now permitted to

receive non-hazardous solid waste streams generated in Maine (ref. Solid Waste Amendment Order #S-020700-WD-N-A & #S-020700-WD-BI-N).

With the acceptance of the Expansion in 2017, JRL's permitted solid waste footprint consists of approximately 122 acres. 68 acres were approved with the originally permitted JRL footprint, with an additional 54 acres approved with the Expansion. The existing landfill infrastructure also includes a 2-mile primary access road, a maintenance/administration building, several storage buildings, a dual scale house, a former leachate storage pond now used for stormwater detention, a leachate storage tank, five primary leachate pump stations, one leachate haul truck loading rack, one water haul truck loading rack, multiple detention/sedimentation ponds, a construction material laydown area, Thiopaq and Sulfa Treat gas scrubbing systems, a storage/processing pad for clean wood debris and railroad ties, a perimeter access road, a newly constructed Renewable Natural Gas (RNG) Processing Facility, and two landfill gas flares (one belonging to JRL, and the other to the owners of the RNG Processing Facility).

With the approved Expansion, the majority of the site infrastructure will remain. However, in preparation for future cell Expansion, the old scale house, the old administration building (which was re-purposed as a storage building), and water truck loading rack were all relocated from their previous locations. The new locations are shown on Figure 1-1 and Figure 5-1. The overall site development, including the Expansion cells, are shown on Figure 1-2.

LEGEND

12 CELL IDENTIFICATION

WETLAND DELINEATED

WETLAND PHOTO INTERPRETED

NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 12/31/14. VERTICAL DATUM: BRASS PLUG AT PUMP STATION. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY PLISGA & DAY LAND SURVEYORS, BANGOR, MAINE.
2. WETLAND BOUNDARIES DELINEATED BY WOODLOT ALTERNATIVES, INC. IN 2004 AND STANTEC CONSULTING SERVICES 2008, 2014 AND 2015.

RELOCATED SCALES

FENCE

OVERHEAD ELECTRIC LINE (TYP)

DETENTION POND 10

DETENTION POND 9

DETENTION POND 11

DETENTION POND 12

LANDFILL BASEGRADES (TYP)

SOLID WASTE LIMIT

DETENTION POND 1

PERMITTED WOOD WASTE HANDLING AREA

STORAGE BUILDING

MAINTENANCE/ ADMINISTRATION BUILDING

RNG FACILITY STORMWATER POND

LANDFILL GAS TREATMENT FACILITY

RNG FACILITY

JRL/RNG LFG FLARES

PERMITTED SOLID WASTE BOUNDARY

LEACHATE STORAGE TANK

STORAGE BUILDING (FORMER ADMINISTRATION BUILDING)

DETENTION POND 6

WETLANDS (TYP) SEE NOTE 2

CELL 5 PUMP STATION

PROPERTY LINE

CELL 4 PUMP STATION

DETENTION POND 1A

200 0 400 FEET

FIGURE 1-2
SITE DEVELOPMENT PLAN
JUNIPER RIDGE LANDFILL EXPANSION
OLD TOWN, MAINE

SME
SEVEE & MAHER ENGINEERS

DWG: EXPANSION FIG LMN: FIG-SITEDEV CTB: SME-STD REV: 4/23/2024

\\Nserver\cfs\Casella\OldTownLandfill\GeneralSite\fig\Operations Manual\2023\ACAD\Figures\EXPANSION-FIGS.dwg, B_FIG1-2 DR, 4/23/2024 8:40:28 AM, bwb

2.0 CERTIFIED COPIES AND ANNUAL REVIEW

NEWSME maintains a total of seven certified copies of this Operations Manual. A "Certified Copy" is defined in 06-092-CMR 400.1.X of the Rules as "a copy of the Department approved Operations Manual implemented by the Owner/Operator of a landfill facility that is assigned to be updated and tracked by a person specified by the Owner/Operator." That person for JRL is the ECM. Certified copies of the Operations Manual are distributed to the MEDEP (3 copies), the City of Old Town (1 copy), NEWSME's Operations Manager (1 copy), the BGS (1 copy), and 1 copy is maintained by NEWSME's ECM. In addition, digital copies are also provided with each physical copy, and a digital control and original copy are maintained by the ECM.

06-092-CMR 401.4.A(2) of the Rules requires that the certified copies of the Manual reflect operational changes made at the facility, and that these changes be distributed to those individuals whose job assignments require them to be aware of the changes. At a minimum, the Manual is reviewed by NEWSME on an annual basis and updated as necessary to reflect changes to the facility. Annual updates to the certified copies are provided to the parties listed above via the Annual Report to be incorporated into each Manual. These changes/additions should be placed in each Manual by responsible individuals.

NEWSME also performs an annual self-audit of landfill operations as required by 06-092-CMR 401.4.D(1)(b) of the Rules. Included in Appendix B is a compliance self-audit checklist that is used for the audit. A copy of the completed audit is included with the Annual Report submitted to the MEDEP.

3.0 OPERATOR TRAINING AND CERTIFICATION

As required by 06-092-CMR 401.4.B of the Rules, NEWSME provides a minimum of 8 hours training annually to at least two key personnel in the landfill operations, and has key personnel maintain a valid certification as a Manager of Landfill Operations from the Solid Waste Association of North America (SWANA) or equivalent certification. Trained individuals can include the Environmental Compliance Manager, the Region Engineer, the General Manager, and the Operations Manager. The topics covered for the site-specific training are presented in the outline contained in Appendix C. The training addresses issues relating to landfill operations and the regulatory requirements for the landfill facility. Documentation of training for the key personnel is kept on file at the facility for a minimum of five years. The documentation includes the name of the individual(s), his/her position, the type of training and the date training took place.

4.0 JRL ORGANIZATIONAL STRUCTURE

4.1 Organization Responsibilities

Proper operation and maintenance of the landfill facilities are the responsibility of NEWSME and its employees. Other entities indirectly involved with the landfill operation include the BGS, the MEDEP, and the City of Old Town. Specific employees of NEWSME involved with landfill operation and maintenance, along with the responsibilities of each employee and other relevant entities, are described in the following paragraphs:

- BGS. Maine Bureau of General Services (BGS) is the owner and licensee of the landfill.[1]

- NEWSME. NEWSME is the operator of the landfill and is responsible for the operation and maintenance of the landfill. NEWSME is the full-time employer of the Operations Manager, Equipment Operators, Laborers, and any other personnel deemed necessary to operate the landfill. The General Manager, Environmental Compliance Manager, and Facility Manager/Environmental Technician are also employed by NEWSME. NEWSME is a wholly-owned subsidiary of New England Waste Services, of ME, Inc.

- MEDEP. MEDEP is responsible for licensing, assistance, inspection, interpretation, and enforcement of solid waste management laws and regulations. MEDEP maintains a knowledgeable staff that provides advice on the design and operation of solid waste facilities throughout the State of Maine. In addition to assistance, MEDEP inspects the facility on a regular basis to ensure that operations are in conformance with current laws and regulations.

[1] Pursuant to P.L. Chapter 655, Sec GC-69, on July 1, 2012, the Bureau of General Services in the Department of Administrative and Financial Services became the owner and licensee of JRL.

- City of Old Town Code Enforcement Officer. The City of Old Town Code Enforcement Officer (CEO) is responsible for enforcing the City of Old Town's ordinances, and conditions in Planning Board approvals.

4.2 Personnel and Responsibilities

Specific employees of NEWSME responsible for operation of the landfill include the General Manager, Environmental Compliance Manager, Facility Manager/Environmental Technician, Site Safety Officer, Operations Manager, Lead Scale Master, Equipment Operators, Mechanics, and Laborers. Each position has the following responsibilities for operations of the facility:

General Manager. The General Manager of NEWSME has the overall responsibility for supervision and management of site operations, staffing, construction, budgets, and compliance. With respect to the landfill operation, the General Manager's responsibilities include the following:

- Maintain liaison with the MEDEP, the BGS and the City of Old Town to ensure that the landfill is being operated in accordance with state & local requirements.
- Address staffing and equipment needs of the facility and establish budgets for its operations.
- Coordinate construction activities.

Environmental Compliance Manager (ECM). The ECM is responsible for the site's compliance with state, federal and local permits and licenses, applicable federal regulations, site inspections, approving waste streams, state and federal reporting, and environmental training. The ECM also acts as a MEDEP contact for waste acceptance, inspections, permitting, and reporting.

Facility Manager/Environmental Technician (FM/ET): The FM/ET is responsible for the oversight and maintenance of several key environmental systems at the JRL facility. These systems may include but are not limited to: leachate, gas collection, gas

treatment, storm water controls, etc. Additionally, the FM/ET performs the various facility inspections, sampling, and data collection for reporting purposes.

Site Safety Officer. The Site Safety Officer is responsible for coordinating all safety related issues at the JRL site, including safety training, addressing safety issues, and updating the Site Safety Manual.

Operations Manager. The Operations Manager is responsible for coordinating landfill operations. It is the Operations Manager's responsibility to ensure that the facility is operating properly and in compliance with current laws and regulations. The Operations Manager's responsibilities include site maintenance and waste placement, street sweeping, mowing, erosion control, odor control, stormwater and leachate collection system maintenance, and site repairs.

Lead Scale Master. The Lead Scale Master is responsible for supervising state-certified scales, scale personnel, and 24-hour site security.

Equipment Operators. The Equipment Operator's duties include operating necessary equipment to transport, place, and compact wastes placed in the landfill, apply daily cover, complete road construction, install gas collection infrastructure, and perform general site construction. Heavy equipment operation, general knowledge of earthwork and road construction, and the ability to perform routine maintenance and make minor repairs to equipment are desirable skills for an equipment operator.

Mechanics. The Mechanic's duties include repair of landfill operating equipment and mechanical infrastructure, and the ability to operate necessary equipment to transport, place, and compact wastes placed in the landfill, apply daily cover, complete road construction, install gas collection infrastructure, and perform general site construction, should it be necessary.

Laborers. The Laborer's duties can vary depending on the need, but include installation, maintenance, and troubleshooting of gas collection infrastructure, landfill equipment

operation, various site construction activities, landfill monitoring under the supervision of a site environmental technician, and general landfill site upkeep and cleanliness.

In addition, NEWSME may elect to conduct certain operational functions by contract with local contractors. Such functions may include, but are not necessarily limited to, construction of landfill cells, roads, stormwater structures, and placement of temporary and final landfill cover systems. A responsible NEWSME employee (i.e., Manager or operator) will be on-site during all operating hours.

5.0 JRL DEVELOPMENT OVERVIEW

This section provides a general overview of the entire JRL development with specific cell development plans related to the Expansion found in Appendix D of this Manual.

5.1 Cell Construction

JRL's permitted solid waste footprint currently consists of approximately 122 acres. 68 acres (approximately 10 base cells) was the original MEDEP permitted solid waste footprint at JRL, with an additional 54 acres (7 additional base cells, replacing 6 due to downsizing base cell sizes) approved with the Expansion. Additional development occurs on top of the base cells up to a final elevation of 390 feet. The Expansion will consist of seven cells (i.e., Cells 11 through 17) that also will be developed up to the final elevation of 390 feet. Figure 5-1 depicts existing conditions and cell development currently at JRL. Portions of landfill cells are generally constructed by excavating to depths of approximately 5 to 15 feet, while other areas of the cells may receive backfill in order to achieve the proper base grading of the cell. As required by Condition 5 of the Department Order #S-020700-WD-BI-N dated June 1, 2017, at least 4 months prior to new cell construction and related infrastructure, the applicant must submit the detailed design package for the Department's review and approval. The submittal shall contain the information required by the Rules, including, but not limited to an engineering report, construction contract bid documents consisting of technical specifications, drawings and contract administrative documents, a quality assurance plan and erosion and sedimentation control and stormwater management plans. If the Rules applicable to any aspect of the design and construction of the landfill expansion and its ancillary structures change during the development of the proposed expansion, the applicant shall address the new requirements in subsequent pertinent submittals. Once the landfill cell construction is complete, a Construction Documentation Report is prepared and also submitted to MEDEP. Copies of the Landfill's Permit Applications, Design Reports, and Construction Documentation Reports are managed by the ECM.

Originally permitted landfill Cells 1 through 10 are constructed with underdrain systems to relieve upward groundwater pressure as appropriate. The cells have a composite liner system consisting of an 80-mil HDPE flexible membrane liner overlying a geocomposite clay liner and

EXISTING OVERHEAD UTILITY LINES FROM ROUTE 16
EXISTING WETLAND
BEDROCK OUTCROP (TYP)
APPROXIMATE LOCATION OF GRUBBINGS AND EROSION CONTROL MIX STOCKPILE, COORDINATE WITH OWNER (TYP)
PERMITTED TILL AND BORROW PIT
EXISTING OVERHEAD ELECTRIC LINE (TYP)
PROTECT EXISTING WELLS (TYP)
EXISTING CELL 14 PUMP STATION
EXISTING FORCEMAIN (TYP)
EXISTING FORCEMAIN VAULT
RIPRAP DITCH
EXISTING PRIMARY ACCESS ROAD
EXISTING OVERHEAD UTILITY LINES
DETENTION POND 11
DETENTION POND 9
DETENTION POND 10
RNG SITE STORMWATER DETENTION BASIN (SEE NOTE 5)
EXISTING SUBSURFACE WASTEWATER DISPOSAL FIELD
LFG TREATMENT FACILITY
RNG FACILITY (SEE NOTE 5)
MAINTENANCE BUILDINGS
PERMITTED WOOD WASTE HANDLING AREA
EXISTING JRL/RNG LFG FLARE LOCATION
APPROXIMATE LOCATION OF SHALLOW BEDROCK (TYP)
EXISTING CELL 13 PUMP STATION
EXISTING CELL 12 PUMP STATION
CELL 11
EXISTING CATCH BASIN AND CULVERT (TYP)
EXISTING LEACHATE STORAGE TANK PUMP STATION
EXISTING LEACHATE STORAGE TANK
CELL 14
CELL 13
CELL 12
CELL 10
CELL 9
CELL 7
CELL 8
SMH-17
EXISTING 24" LFG HEADER
EXISTING LFG KNOCKOUT STRUCTURE (TYP)
EXISTING WETLAND
8"LC-STAGE 1 FINAL COVER
DETENTION POND 6
CELL 3B
CELL 4
CELL 6
CELL 8 PUMP STATION
PROPERTY LINE
UTILITY MANHOLE (TYP)
EXISTING (2) 24" HDPE CULVERTS
6" DIA LEACHATE COLLECTION PIPE
CELL 3A
CELL 5
LIMIT OF EXISTING CELLS LINER SYSTEM (TYP)
CELL 16
CELL 15
CELL 2
STAGE 2 FINAL COVER
EXISTING 8"x12" LEACHATE FORCEMAIN
LANDFILL ACCESS RAMP
CELL 4 PUMP STATION
CELL 1
EXISTING UNDERGROUND ELECTRIC (TYP)
CELL 16 TEMPORARY MAINTENANCE ROAD
CELL 16/17 TEMPORARY BERM
CELL 16 PUMP STATION
LEACHATE POND
CELL 5 PUMP STATION
EXISTING LEACHATE FORCE MAIN
EXISTING CLEAN WATER LOADING RACK
DETENTION POND 1

100 0 200 400 FEET

NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC, NORRIDGEWOCK, MAINE. PHOTO DATE 5/21/2024. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC., OF CUMBERLAND, MAINE.
2. WETLAND BOUNDARIES DELINEATED BY WOODLOT ALTERNATIVES, INC. IN 2004, STANTEC CONSULTING SERVICES 2008, 2014, 2015, AND BRI ENVIRONMENTAL IN 2024.
3. DRAWINGS ARE FOR SITE OPERATIONS USE ONLY. DRAWINGS SHALL NOT BE USED FOR CONSTRUCTION.
4. LOCATION OF ALL UTILITIES, POWER & COMMUNICATIONS, WATER, SEWER ETC NOT SHOWN ON THIS PLAN.
5. PLAN UPDATED ON FEBRUARY 2025, BASED ON INFORMATION SUPPLIED BY CASELLA WASTE SYSTEMS, INC. AND ANTICIPATED WASTE GRADES WITHIN CELL 16.

DWG: EXCON-SITEDEV LMN: EXCON-SITEDEV CTB: SME-STD REV: 4/29/2025

FIGURE 5-1
EXISTING CONDITIONS/ SITE DEVELOPMENT PLAN JUNIPER RIDGE LANDFILL OLD TOWN, MAINE

SME
SEVEE & MAHER ENGINEERS
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE
4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021
Phone 207.829.5016 • Fax 207.829.5692 • smemaine.com

\\Server\Vol\Castle\OldTown\Landfill\Permit\Site\MXD\2025\April\Figure5\2025\EXCON-SITEDEV.mxd FIG 5-1 4/29/2025 2:27:19 PM kjm

and 2 feet of low permeability material to achieve a combined hydraulic conductivity of 2.9×10^{-9} cm/sec. The cells also contain a leachate collection system consisting of a 12-inch layer of granular material with an average hydraulic conductivity of 1×10^{-2} cm/sec, a geocomposite drainage net, and a piping network consisting of 6- and 8-inch diameter collection laterals, spaced at approximately 100 to 200 feet on center, that connect to 8-inch and 12-inch diameter collection header pipes.

Landfill Expansion Cells 11 through 17 will also be constructed as secure solid waste landfill cells but with two liners, a primary and a secondary, a leak detection system, leachate and gas collection and transport systems, and intermediate and final cover systems. Under the entire base of the Expansion an imported soil layer, consisting of one foot of compacted clay, will be installed to provide a uniform, low hydraulic conductive soil layer under the secondary liner. A granular underdrain collection system will be installed under 12.7 acres of the Expansion where the landfill base is located below the site's phreatic surface (water table).

Leachate generated within the JRL cells is handled by leachate sumps which are designed and constructed to handle the leachate flow from one or a series of cells. Pump stations are designed and constructed at each sump to accommodate the predicted volume of leachate from the collection area. Each pump station transfers the leachate to a 921,000-gallon aboveground storage tank for temporary storage prior to trucking the leachate off-site for treatment.

A more detailed description of the design and construction of the facility's leachate collection & storage systems may be found in the Construction Documentation Reports for the individual cells, which may be found on file with the ECM.

5.2 Landfill Cell Intermediate Cover

As each base landfill cell reaches its interim operational grade, operations are moved into a new cell, then intermediate closure instituted. Intermediate closure generally consists of installing vertical landfill gas (LFG) collection wells, shaping all surface areas to appropriate grades, then installing the intermediate cover systems. Intermediate cover systems usually consist of a soft waste (ash or wood fines) or sand layer, then 18 inches of till or a 40-mil geomembrane cover.

If till is utilized, the final surface is seeded and mulched to establish vegetative growth for sedimentation and erosion control purposes. Stormwater controls are designed and constructed to handle clean stormwater runoff from the intermediate cover. The base cells' second elevation filling, and the Expansion cells follow this same intermediate cover practice.

5.3 Final Cover System

The proposed final cover system for the landfill will use similar engineered components (i.e., textured geomembrane), and earthen materials (i.e., granular drainage sand, clays/till barrier soil, and vegetative cover soil) that will be used in the landfill construction. Placement of the proposed final cover system will comply with the similar material installation specifications and follow the same quality control/quality assurance protocol as used for the cell construction. The final cover system proposed for the landfill is as follows: (from the top down)

- 18 inches of a vegetative cover soil;
- Drainage geocomposite;
- 40-mil LLDPE textured geomembrane;
- Geosynthetic Clay Liner (GCL);
- 12 inches of compacted till; and
- 6 inches of sand or waste processing fines (base grade bedding layer)

Prior to placing any final cover material, detailed design drawings and technical specifications will be prepared and submitted to MEDEP for review and approval. The borrow source materials used for closure will be obtained from permitted sources.

5.4 Stormwater/Erosion Control Systems

Since the original permit application (August 1991), there have been a number of stormwater, erosion and sedimentation control plans developed and implemented at the JRL in accordance with the facility's operating permits and with MEDEP Best Management Practices for Stormwater and Erosion Control. A copy of the current Stormwater Management and Erosion Control Plan (JRL Stormwater Pollution Prevention Plan) is contained in Appendix F of this Manual.

6.0 JRL DEVELOPMENT PLANS

This section describes the general development of originally permitted JRL landfill cells and Expansion cells. Detailed cell development plans, and landfill gas infrastructure plans for Cells 11, 12, 13, 14, 15, and 16 of Expansion cells, are also contained in Appendix D. The detailed cell development plans for the remaining Expansion cells will be developed as part of the detailed design of the individual landfill cells and submitted to MEDEP prior to construction of the cells. Cell 17 is scheduled for construction in 2026. Development plans will be added once approved.

6.1 Originally Permitted Landfill Cell Development

Each of the originally permitted landfill base cells (cells 1 through 10) were generally filled to an approximate elevation of 325 feet-MSL before operations move into the next cell. Operations commence on the second elevation once enough base cells are constructed to provide adequate operational area to final elevation. Operations begin in each new landfill cell by placing a soft layer (approximately 5 feet in depth) of approved waste material. If operations are not going to move into a newly constructed cell prior to the winter months, a frost layer consisting of two feet of bark (or other approved material) is placed over the cell to protect the liner systems until the soft layer can be placed. As the soft layer is placed in the cell, an access road is constructed with tipping pads to accommodate waste deliveries. As elevations in the cell increase, varying access road configurations are utilized to allow safe access into the active portions of the cell for depositing wastes.

The landfill cells are built sequentially and filled in lifts to allow for proper commingling and compaction of the wastes. Section 7.0 of this Manual provides more specific details pertaining to the waste placement operations. As each cell is filled, a series of lateral gas collection systems are installed at specific elevations in order to control fugitive landfill gas (LFG) emissions and potentially resulting odors. Vertical landfill gas wells are usually installed on certain side slopes that have reached their final grades and on top of each cell after interim or final grade. In order to assure proper leachate drainage within the cell, a series of collection structures and drainage piping is installed while the cell is being filled with wastes. This

generally consists of a series of vertical chimneys (tire chips) within the interior of the waste mass and extensions of the leachate collection system piping to collect contaminated stormwater at higher elevations around the inside perimeter of the cell. More detailed discussions on LFG and leachate collection systems may be found in Section 7.0 of this Manual.

The development and operations of the originally permitted JRL cells were done in a sequential manner as shown in Cell Development Plans contained in previous Operations Manuals. The plans were designed to meet the standards in Chapter 401.2.D(6) of the Rules. As various phases of the landfill were developed, intermediate and/or final cover is applied as interim or final grades were reached.

The last phase of the originally permitted landfill waste filling includes filling over the eastern and northern outer waste side slopes of the originally permitted landfill cells to achieve the final waste grades as shown on Figure 6-1. It is NEWSME's intent to fill this capacity in conjunction with filling of the Expansion cells described in Section 6.2.

NOTES

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, AND ACCESS ROADS, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED NOVEMBER 15, 2019.
2. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC (SME) OF CUMBERLAND, MAINE USING PROPELLER AEROPOINTS, DATED NOVEMBER 15, 2019:
   HORIZONTAL DATUM - NAD83 MAINE, WEST, US FT.
   VERTICAL DATUM - NAVD 88, US FT.
3. REMAINDER OF BASE MAP PREPARED BY AERIAL SURVEY & PHOTO, NORRIDGEWOCK, MAINE. PHOTO DATE 6/24/2019. HORIZONTAL DATUM MAINE STATE COORDINATE SYSTEM EAST ZONE, NAD 83. GROUND CONTROL BY PLISGA & DAY, BANGOR, MAINE. STANDARD PRACTICE DICTATES THAT PLANS COMPILED IN THIS MANNER SHOULD BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. WETLAND BOUNDARIES DELINEATED BY STANTEC OF TOPSHAM, MAINE.
5. BORINGS & TEST PIT LOCATIONS FIELD SURVEYED BY SEVEE & MAHER ENGINEERS, INC. OF CUMBERLAND, MAINE.
6. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.
7. ONLY LEACHATE COLLECTION SYSTEM COMPONENTS WITHIN THE EXISTING LANDFILL LIMITS ARE SHOWN ON THIS DRAWING.

SITE BENCHMARK INFORMATION

DESCRIPTION	NORTHING	EASTING	ELEVATION
PLUG 1 PERMANENT BENCHMARK BRASS PLUG ON PUMP STATION	478242.05	925376.35	167.93
PLUG 2 BRASS PLUG AT ADMINISTRATION BLDG	479497.17	926131.46	215.12

LEGEND

WETLAND

150 0 300 FEET

FIGURE 6-1
ORIGINAL PERMITTED LANDFILL
FINAL WASTE GRADES
JUNIPER RIDGE LANDFILL EXPANSION
OLD TOWN, MAINE

SME
SEVEE & MAHER
ENGINEERS

DWG: FINAL WASTE GRADES LMN: FWG CTB: SME-STD REV: 4/9/2020

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6.2 Expansion Cell Development

NEWSME will construct and operate the Expansion in a sequential manner, consisting of constructing and operating a series of seven landfill cells. Each landfill cell was originally sized to have approximately two years of capacity so new cell construction is anticipated to occur every two years. Due to recent changes to Maine's waste landscape and unforeseen struggles by other solid waste processors and incinerators throughout the state, JRL at times has filled up newly constructed cells much faster than expected. This is because JRL remains a backup facility for many other solid waste facilities in Maine, which at times have struggled to process waste or have bypassed waste due to scheduled/unscheduled maintenance.

The cell development concept also incorporates a phased final cover construction over the originally permitted and Expansion JRL landfill cells. The cover construction will generally occur in those years when cell construction is not occurring. The actual timing for both cells and cover construction will depend on the yearly capacity consumption reviews and the projection of when new cell disposal capacity will be needed. Operations begin in each new landfill cell by placing a soft layer (approximately 5 feet in depth) of approved waste material. If operations are not going to move into a newly constructed cell prior to the winter months, a frost layer consisting of two feet of bark (or other approved material) is placed over the cell to protect the liner systems until the soft layer can be placed. As the soft layer is placed in the cell, an access road is constructed with tipping pads to accommodate waste deliveries. As elevations in the cell increase, varying access road configurations are utilized to allow safe access into the active portions of the cell for depositing wastes.

NEWSME constructed Expansion Cell 11 in 2018, Cell 12 in 2020, and Cell 13 in 2021, Cell 14 in 2022, and Cell 15 in 2023, and Cell 16 in 2024. Appendix D includes the cell development plans for Cell 11, Cell 12, Cell 13, Cell 14, Cell 15, and Cell 16. Detailed cell development plans for the remainder of the Expansion cells will be developed and submitted to MEDEP prior to their construction. Typical operational development details for the Expansion cells are included in Appendix E. The final waste grades for the entire facility, including the Expansion cells, are shown on Figure 6-2.

NOTES

1. GRADES SHOWN IN CELL REPRESENT BASE CELL GRADES PRIOR TO WASTE FILLING.
2. FINAL GRADES REPRESENT TOP OF WASTE.
3. SEE ATTACHED TABLE FOR SUMMARY OF STORMWATER CULVERTS, CATCH BASINS AND DITCHES.

LEGEND

- AREAS OF FINAL COVER
- PERMANENT PUMP STATION
- FM — LEACHATE TRANSPORT FORCEMAIN

RELOCATED SCALES
FENCE
OVERHEAD ELECTRIC LINE
EXISTING MAIN ACCESS ROAD
CATCH BASIN AND CULVERT (TYP)
24' WIDE PAVED ACCESS ROAD
CELL 13 PUMPSTATION
DETENTION POND 11
DETENTION POND 10
PERMITTED TILL BORROW PIT
DETENTION POND 9
EXPANDED DETENTION POND 9
PERMITTED WOOD WASTE HANDLING AREA
STORAGE BUILDING
MAINTENANCE/ ADMINISTRATION BUILDING
LANDFILL GAS TREATMENT FACILITY
LFG FLARE
LEACHATE STORAGE TANK PUMP STATION
LEACHATE STORAGE TANK
STORAGE BUILDING (FORMER ADMINISTRATION BUILDING)
24" LFG HEADER
DETENTION POND 6
CELL 8 PUMPSTATION
RIPRAP DOWNSPOUT (TYP)
MAINTENANCE ROAD
20' WIDE PAVED ACCESS ROAD (TYP)
DETENTION POND 12
CELL 16 PUMP STATION
DETENTION POND 1
CELL 4 PUMP STATION
DETENTION POND 1A
CELL 5 PUMP STATION
EXISTING LANDFILL FINAL GRADES (TYP)
PROPERTY LINE

200 0 400 FEET

FIGURE 6-2
FINAL WASTE GRADES
JUNIPER RIDGE LANDFILL EXPANSION
OLD TOWN, MAINE

SME
SEVEE & MAHER ENGINEERS

DWG: CELL-DEV LMN: FWG CTB: SME-STD REV: 4/7/2020

7.0 OPERATING PROCEDURES

This section describes standard operating procedures for the JRL facility in accordance with Rules Chapter 401.4(C).

7.1 Acceptable Solid Wastes and Waste Characterization

JRL is licensed to accept in-state non-hazardous waste streams as identified in its operating permits and licenses. Acceptable wastes are commingled within the active cells of the landfill. The ongoing landfill operations at the JRL have demonstrated that the wastes received for disposal are compatible with the existing landfill's liner system. The waste streams are also compatible with each other as demonstrated by the historical commingling of these waste streams. The JRL waste stream currently consists mainly of the following types of non-hazardous waste materials:

- Construction & Demolition Debris (CDD)
- Front-End Process Residuals (FEPR)
- Municipal Solid Waste Incinerator Ash and Multi-Fuel Boiler Ash
- CDD Processing Fines
- Oversized Bulky Wastes
- Municipal Wastewater Treatment Plant Sludge
- Industrial Wastewater Treatment Plant Sludge
- Contaminated Soils
- Oil Spill Debris
- Municipal Solid Waste[2]
- Miscellaneous Special Wastes

[2] Only MSW that has been bypassed from MSW Incinerators or Coastal Resources of Maine will be accepted.

Table 7-1 is a summary of wastes accepted at the JRL. Miscellaneous non-hazardous waste streams at the JRL include, but are not limited to, the following:

TABLE 7-1

SUMMARY OF WASTES ACCEPTED AT JUNIPER RIDGE LANDFILL

Air & Water Filtration Media	Leather Scrap Wastes
Approved Land Utilization Wastes	Manufacturing Wastes
Asbestos (Non-friable)	Marijuana, Hemp & Invasive Plant Species
Biomass Boiler Ash	Municipal Solid Waste (Bypassed from Maine Incinerators/CRM)
Biomedical Incinerator Ash	Municipal Solid Waste Ash
Burned RR Ties & Associated Ash	Non-Hazardous Chemical Related Products
Catch Basin Grit	Off-Spec Foods and Off-Spec Products
Clean Wood Open Burn Ash	Oversized Bulky Wastes
Construction & Demolition Debris	Pigeon Waste
Contaminated Soil	Pulp & Paper Mill Sludge
Dead Animals Carcasses (on a case-by-case basis)	Sandblast Grit
Dredged Spoils from Waterways	Sulfur Scrubbing Residue
Dried Paint Residue & Related Debris	Treated Biomedical Waste
Filter Press Cake & Collagen Scrapings	Urban Fill-type Soils
Filter Medias – Ambient and Non-Ambient Sources	Virgin Petroleum Contaminated Soil & Debris
Fossil Fuel Boiler Ash	Waste Oil Contaminated Soil & Debris (Oily Debris)
Gasoline Contaminated Soil & Debris, Surface Spill	Wastewater Treatment Plant Sludge
Gasoline Contaminated Soil & Debris (UST)	Water Treatment Plant Sludge
Grit Screening Waste	
Laundry Sludge	

In addition to the above blanket waste streams, JRL can accept individually permitted wastes approved at the facility, typically from one-time events. These permits can be found on file with the ECM.

The procedures for characterizing, (i.e., testing) and accepting waste streams at the JRL are identified in the facility Solid Waste Characterization Plan included as Appendix G of this Manual. The plan includes acceptance criteria for both individual permits and blanket permit approvals of wastes. Records of waste acceptance data will be kept on file and made available for viewing by MEDEP during normal business hours. Additionally, waste activity reports are submitted to the MEDEP, BGS, and the City of Old Town on a monthly basis that provide

pertinent data regarding all waste deliveries to the facility for the previous month. The monthly report data includes the following information:

- Date of delivery
- Approval (manifest) number
- Waste description
- Quantity delivered in tons
- Transporter name
- Generator name
- Waste origin (Maine County)

7.2 Facility Access/Hours of Operations

Access to the facility is achieved through a gated primary access road that enters the site from Route 16 in Alton, Maine, ensuring that access is controlled. The paved site access road is approximately 2 miles in length between Route 16 and the entrance into the permitted boundary of the landfill. NEWSME has located a scale and attendant facility at the entrance to the landfill that is currently occupied 24 hours per day, and seven days per week.

The gate at the entrance to the landfill is closed and locked during extended periods when wastes are not being delivered to the facility. The access road is maintained by landfill personnel and remains accessible for traffic year-round. Only authorized employees of NEWSME and certain contractors have unrestricted access to the landfill facility. All others are required to receive clearance through NEWSME Administration or the Scale House Attendant. Required signs are posted at the entrance to the facility near the scale house. While operating hours at the landfill may vary from season to season, the normal hours of operation at the facility are:

- Monday through Friday……6:00 AM - 5:00 PM
- Saturday ……7:00 AM – 12:00 PM
- Sunday.....Closed

Some waste streams (i.e., PERC ash) may require 24 hour per day disposal service. Delivery of these wastes, and minimum landfill operations to place these wastes, may occur outside of the standard hours of operations.

NEWSME maintains the site's internal access roads to prevent the accumulation of dust, mud, and waste on public roads. Maintenance activities include sweeping, applying water and/or calcium chloride to the internal gravel roadways to prevent dust generation and maintaining gravel roadway surfaces to prevent mud accumulation on public roads.

With the exception of trucks carrying CDD and MSW (originally permitted landfill only) or MSW Bypass, only waste hauling vehicles with pre-approved materials will be allowed access to the landfill. Waste hauling vehicles will be monitored by the scale house and landfill operators upon entry to the landfill and during off-loading in order to assure that no unacceptable wastes are present, and materials are as identified, described, and certified.

7.3 Open Burning

Open burning of waste or any other material is strictly prohibited at the JRL Facility. Use of open flames for construction related activity is by permit only, obtained through NEWSME's Site Safety Officer.

7.4 Hot Loads

In the event that a hot load is delivered to the JRL, the waste will be managed in accordance with 06-092-CMR 401.4.C(4) of the Maine Solid Waste Rules. A separate gravel or ash pad area will be sited within the confines of the operating cell in order to properly manage hot loads. The material will be offloaded onto the pad and handled appropriately to allow cooling. Burning material will be extinguished immediately by applying a water spray as necessary or covering with soil-based material to smother the flames. Once the material has cooled, it will be transferred to the active disposal area of the cell to be commingled with the other wastes or used as daily cover material.

7.5 Setbacks and Buffer Strips

The originally permitted JRL and the Expansion have been sited to minimize adverse effects on the existing natural environment and to not adversely affect existing uses, scenic characteristics, or natural resources of the neighboring locality.

NEWSME will maintain the existing natural buffer strips between the facility's solid waste boundaries and public roads, property boundaries, and residences, as approved in the original License. Activities such as additional tree clearing or disturbance of vegetation will not occur without first obtaining approval from the MEDEP. All setbacks to the solid waste boundary meet or are superior to the required MEDEP criteria, as follows:

	Original Setback	**Expansion Setback**	**MEDEP Minimum Setback**
Public Roads	2,000 feet	2,400 feet	300 feet
Private Residences	1,500 feet	2,100 feet	1,000 feet
Private Water Supply	1,500 feet	2,100 feet	1,000 feet
Surface Water	300 feet	950 feet	100 feet
Airport	+/- 13,000 feet	+/- 13,000 feet	5,000-10,000 feet
Property Boundary	500 feet	420 feet	300 feet

7.6 Cell Development Plans

Cell Development Plans for Cells 11, 12, 13, 14, 15, and 16 of the Expansion are provided in Appendix D. These plans show the sequence for development of the facility including placement of cover materials. Detailed cell development plans for the remainder of the Expansion cells will be developed and submitted to MEDEP prior to their construction. Approved plans will then be included in the Operations Manual, based upon the approved landfill design. The plans will cover two years of landfill operations and include specific information on waste lift thickness and sequencing of waste placement in the individual cells.

7.7 Compaction (Waste Placement)

Waste entering the landfill will be unloaded either at a designated unloading area within the landfill or directly into the active face as directed by the landfill operator. Traveling over the base of the landfill by trucks shall be done only in areas where more than 5 feet of waste has been placed. Waste shall be placed in the landfill in a manner that enables the operator to commingle the waste. Like waste loads shall be evenly distributed throughout the landfilling area. Wastes shall be placed and spread using a solid waste compactor and bulldozer, in layers 1 to 2 feet thick, when feasible, to optimize waste density and compaction effort.

After the waste is placed, it will be compacted using a solid waste compactor. A minimum of three successive passes shall be made over the entire waste area to be compacted. Additional passes may be required to acquire the proper compaction. As waste is placed and compacted, the side slopes are created using appropriate stable waste. Outer side slopes shall be graded 3H: 1V using ash or other approved material. Inner waste side slopes can be graded 2H: 1V with ash or CDD processing fines or other approved material. Lifts of waste shall be placed in this manner in each cell.

Several operational details are common to all waste placement within the landfill, as follows:

- First, all outer waste side slopes shall be graded to achieve a final grade of 3 feet horizontal to 1-foot vertical (3H: 1V). The outer side slopes are defined as the slope emanating from the top of the perimeter drainage stone at the perimeter dikes.

- Second, sludges or other low-strength wastes shall not be placed closer than 50 feet from the exterior side slopes unless they are mixed with higher strength wastes such as construction and demolition debris, ash, etc. At a minimum, these wastes shall be placed no closer than 25 feet from the exterior side slopes of the facility, when mixed with the higher strength wastes to a consistency that landfill compaction equipment can travel over the mixed waste after it has been placed.

- Third, the daily working open waste placement area shall be limited to 1 acre or less, if possible. The area containing daily cover materials shall be limited to 10 acres or less, if possible.

- Fourth, prior to waste placement over the bottom of the cell, a 5-foot-thick layer of bypass MSW, FEPR, MSW incinerator ash, or other approved “soft” waste shall be spread over the leachate collection sand to stabilize it. The leachate sump areas shall receive 4 to 6 feet of tire chips or other free draining “soft” waste prior to other waste placement.

- Fifth, construction and demolition debris and OBW shall not be disposed of closer than 5 feet from the liner. Construction and demolition debris shall not be disposed of closer than one foot, and OBW shall not be disposed of closer than two feet and five feet, from the outer waste top and side slopes, respectively.

- Sixth, the waste shall be graded in the active fill area to promote positive surface water drainage to the exterior of the cell, where it can be collected and transported to the leachate collection sump. Waste setbacks, at a minimum of 2 feet, shall be maintained at the outer edge of the waste to contain surface water runoff, to allow it to infiltrate into the waste and/or flow into the drainage columns.

- Seventh, the waste placed below landfill access roads built on the exterior waste slopes shall be high shear strength waste, such as construction and demolition debris. The waste has adequate strength if it can be piled, while maintaining side slopes of 1 Horizontal to 1 Vertical. High strength wastes would not include materials such as sludge or other high moisture content materials.

- Eighth, as outside slopes are brought to final waste grade, they shall be temporarily covered with a minimum 18-inch intermediate soil cover or a minimum (30-mil) temporary synthetic cover as soon as practical to control leachate generation and odor, to the extent permitted by seasonal conditions.

At the completion of each cell, the outer side slopes shall be covered with intermediate cover. Other areas to be temporarily closed shall be graded and covered with intermediate cover, so that clean water is shed from the landfill area. If an intermediate soil cover is utilized, it shall be seeded and mulched as soon as practical in accordance with MEDEP's Best Management Practices for Erosion and Sedimentation Control (BMPs). Typical operational development details (i.e., cell access road entrance, waste setbacks, operation berms, etc.) are attached in Appendix E.

Any portions of the landfill reaching final grade, and the area not being proposed for future expansion or development, shall be formally closed in accordance with 06-092-CMR 401.5.B of the Maine Solid Waste Rules upon approval of the closure design plan by MEDEP.

7.8 Cover

Three types of cover will be utilized on the landfill: daily, intermediate, and final cover. Only cover materials previously approved by the MEDEP will be utilized. Prior to installation of any cover material, the waste will be inspected for proper compaction, grade, and ability to shed water. The operator will examine the waste surface to be covered. Areas found to be soft or unstable will be corrected by re-compaction and/or reinforcement with more stable waste. The operator may be required to cut and/or fill to acquire the grades necessary to shed water off the landfill once the cover is installed. Prior to placement of intermediate or final cover**,** the waste grades will be set to direct runoff to storm water controls, such as storm water diversion berms, diversion ditches, riprap downspouts, and riprap ditches. The prepared waste grades will be leveled. The waste surface shall be examined for protruding objects that may inadvertently puncture the membrane cover.

7.8.1 Daily Cover. Cover will be placed daily over all areas receiving front-end process residue (FEPR), MSW Bypass, Municipal Wastewater Sludge and other wastes with odor generating potential. Daily cover will primarily consist of 9 inches of ash, CDD processing fines, wood chips, short-paper-fiber/sludge, contaminated soil, soil-related materials, or soil equivalent foam applied to manufacturer recommended thickness, as approved by the Department. The purpose of the daily cover will be to control odors, windblown litter, and to restrict the attraction of birds.

7.8.2 Intermediate Cover. Intermediate cover will be placed on areas that have reached interim grades where no additional wastes will be placed for a period of six months. The cover will consist of a MEDEP approved synthetic membrane material (minimum 30-mil) or 18 inches of soil-based material having a minimum of 35 percent fines and no rocks greater than 4 inches. If soil is used, it will be placed, compacted, seeded, and mulched in accordance with the MEDEP's BMPs. This cover is meant to allow the diversion of clean surface water runoff from the areas of the landfill that have reached operational final grade. Areas that will receive intermediate cover at the end of each cell construction are shown on the Cell Development Plans in Appendix D.

7.8.3 Final Cover. Final cover will be applied and comply with the design standards contained in 06-092-CMR 401.5.E of the Regulations. Prior to the placement of final cover, detailed design plans will be submitted to the MEDEP for approval as required in the Maine Solid Waste Rules.

7.9 Stormwater Management and Erosion Control

Stormwater management and erosion control practices are implemented at JRL in accordance with the MEDEP Best Management Practices as part of the routine operations at the site. The management of stormwater and erosion control is also addressed at the JRL with each design report and set of construction documents prepared for individual cell development at the site.

Stormwater drainage, detention, and collection structures are inspected on a weekly basis as part of the routine inspection of the facility. The inspections are performed by the Operations Manager, the Facility Manager/Environmental Technician, and/or the Environmental Manager. Any damage to stormwater structures identified during these inspections is remedied as soon as practical. Drainage restrictions that develop over time are abated on an ongoing basis to maximize the efficiency of stormwater structures and conveyance systems.

Erosion control measures undertaken at the facility during the placement of intermediate cover material are provided through a combination of temporary and permanent features such as seeding and mulching and the use of hay bales, stone check dams, riprap, and erosion control

matting. A copy of the Expansion's Stormwater Management and Erosion & Sedimentation Control Plans are contained in Appendix F of this Manual.

7.10 Leachate Management

Leachate generated on-site will be contained, collected and stored on-site until it can be transported off-site for proper treatment. Leachate is collected within the landfill cells by a series of collection and transport pipes that are provided with cleanouts along the perimeter of the cell. Leachate is then directed to an internal sump and pumped directly to the on-site 921,000-gallon aboveground storage tank. The storage tank will be the primary source of leachate storage.

The leachate storage tank is an 81-foot diameter by 25-foot high, 921,000-gallon aboveground steel storage tank with a glass interior coating. Beneath the base of the tank is a geocomposite clay liner (GCL), a granular drainage layer, and a concrete tank foundation with leak detection pipes. The pipes provide a location to monitor potential leaks from within the storage tank. The tank is equipped with a galvanic anode cathodic protection system that is designed to protect the wetted portion of the tank. The tank is also equipped with level controls that will automatically cut off power to the pumps if the tank becomes full and will then restart the pumps when the tank capacity becomes available. Both audible and visual alarms will sound when pumps are cutoff. An overflow structure is also provided as a backup to the automatic control systems. The aboveground leachate storage tank is contained within a secondary containment dike that is also lined with a geosynthetic clay liner. The secondary containment dike is sized to provide 110 percent of the tank's capacity. The leachate tank is inspected on a regular basis as described in Section 8.0. An Operations and Maintenance Manual is attached in Appendix H for the leachate storage tank.

Recent operations have demonstrated that the leachate holding tank has adequate capacity to handle site leachate generation now and through the entire Expansion development. Therefore, the original leachate storage pond is now used to manage stormwater at the site.
The leachate collection and transport system are also designed such that if failure of particular components of the system occurs, a contingency plan can be implemented to contain and store

leachate until the appropriate repairs can be made. A summary of potential failure modes and responses are summarized below.

Failure Mode	Response Plan
Plugging of leachate collection or transport piping, resulting in leachate head build-up in leachate collection layer.	Pipes would be cleaned by either water jetting or acid cleaning.
Malfunction of leachate pumps in internal sumps resulting in ponding of water within the sumps.	Pump can be removed from sumps and replaced with new pump.
Power failure such that pump cannot be operated.	A site backup generator is utilized to supply power to pump stations.
High leachate flows sustained for a long period of time such that the on-site leachate storage capacity is exceeded.	Increase the number of leachate trucks hauling leachate from the site. Alternatively, the leachate can be recirculated into the landfill.

Systems will be monitored according to the schedule found in Section 8.0 (Inspections). Leachate will be loaded into tank trucks and transported to the ND OTM LLC (ND Paper) wastewater treatment plant located in Old Town (or to Anson-Madison Sanitary District as a backup disposal site) for proper treatment.

7.11 Landfill Gas Management

NEWSME has installed an active gas management system at JRL. The site's gas management system includes a candle stick flare and an active gas collection (both horizontal and vertical) piping system. As each cell reaches its final grade, and intermediate or final cover is applied, a gas control system is installed to properly manage gas generation from within the cell. A copy of the Landfill Gas Infrastructure Plan and Operations & Maintenance Manual may be found in Appendix J. Appendix D contains the plans for the installation of the landfill gas infrastructure for Cell 11, 12, 13, 14, 15, and 16. Cell 17 plans will be added once approved in 2026.

Monitoring gases in ambient air at the JRL site is performed for two reasons: (1) for employees' safety when working in or around confined spaces, including leachate manholes and pump stations; and (2) to evaluate the potential for migration of landfill gases away from the landfill site. The NEWSME Site Safety Officer is responsible for coordinating any activities associated with confined spaces. The potential for landfill gas to migrate away from the landfill is evaluated

through sampling of the site monitoring wells, and at selected gas monitoring locations around the site property boundaries.

06-092-CMR 401.4.C(11) of the Rules requires that methane concentration around the landfill be monitored on a quarterly basis. The Rules also require that immediately upon detection of explosive gas levels exceeding 25 percent of the lower explosive limit for the gases in the landfill structures or 100 percent of the lower explosive limit for the gases at the property boundary, the operator shall take necessary steps to protect human health and notify the MEDEP. The Rules also require the operator to record the methane level, the time the MEDEP was notified, and the protective steps taken at the time of detection. In addition, within 60 days of detection, the operator shall implement a remediation plan to control the release of gases. The plan must be submitted to the MEDEP.

7.11.1 Location. Monitoring of gas associated with the JRL's confined-space-entry program will be done as outlined in the Landfill Safety Manual. Generally, sampling will be done within the confined space prior to entering the area. The monitoring of landfill gases to evaluate their potential migration from the site is also done in the site monitoring wells and at stationary H_2S monitoring locations inside and outside of the site property boundaries (ref. Odor Control Plan, Appendix K).

7.11.2 Frequency. For entry into confined spaces, the monitoring shall be done as outlined in the JRL Site Safety Manual. In the monitoring wells, the sampling frequency shall be three times per year, with the three sampling events occurring during the groundwater sample collection. During sample collection, the wellhead shall be monitored for explosive gas and volatile organic compounds using a meter such as a Landtec GEM meter or Elkins Env200.

7.12 Inspections

In order to assure proper operations at the landfill, NEWSME will perform routine inspections and monitoring at the site. Various components of the facility will be inspected as part of the routine operations, while others will be inspected and documented at a specific frequency. Facility inspections and maintenance is discussed in greater detail in Section 8.0.

7.13 Dust Control

Dust control measures will be implemented at the facility by utilizing water spray trucks to wet secondary roads during dry weather months, and a road sweeper to minimize dirt buildup on paved roadways. Additional measures such as applying calcium chloride may be required on an as needed basis. Dust control measures will be applied as weather permits. The primary access road to the facility has been paved in order to reduce dust generation near local residences.

7.14 Equipment

Equipment will be maintained in proper working order with preventative maintenance completed regularly. Equipment is cleaned on a regular basis to prevent clogging of engine compartments or radiators with dirt or solid waste, which could cause overheating of equipment or fires. Equipment shall be regularly inspected to ensure that safety and noise control devices work properly. Back-up equipment is readily available through local equipment suppliers if it is required. Typical equipment used in the landfill operations is listed in Table 7-2.

TABLE 7-2

TYPICAL LANDFILL EQUIPMENT INVENTORY

- Two compactors – such as Caterpillar 826, and 836
- One excavator such as John Deere 270
- Two dozers such as John Deere 850
- One on-site haul truck such as John Deer 400D
- One front-end loader such as Caterpillar 966G

7.15 Fire Protection

Fire protection and prevention measures applicable to the facility are as follows:

1. NEWSME will be responsible for the development of a fire-protection program and will provide necessary firefighting equipment.
2. Access to all available firefighting equipment will be maintained.
3. Firefighting equipment will be conspicuously located.
4. Firefighting equipment will be periodically inspected and maintained in operating condition. Defective equipment will be immediately replaced.

Landfill personnel shall be made aware of potential fire danger at the landfill site and shall be prepared to act quickly to contain a fire.

To Prevent Fire:

1. An operable, portable, chemical fire extinguisher will be placed in an easily accessible location on site vehicles.
2. An operable fire extinguisher will be readily accessible at site buildings.
3. A hot-load area will be provided for depositing smoldering materials.
4. A stockpile of soil-based material will be available for use in covering smoldering materials and hot ashes.
5. Storage of combustible material (e.g., paints or fuels) will be located securely away from equipment operations.
6. Smoking shall not be allowed in any active portions of the landfill and shall only be allowed in safe designated smoking areas.
7. A telephone or radio will be kept in an easily accessible place with the telephone numbers of the local fire, police, and ambulance prominently displayed.
8. Protective gear will be available to site personnel.
9. Application of a daily cover material will serve as a firebreak.

In the event of a fire, site personnel shall act immediately to contain the fire and take the following steps:

1. Contact the Old Town Fire and Police Departments immediately.
2. Clear the site of users.
3. If the burning material can be pulled away from the working area, do so.
4. Remove combustible materials in the immediate area to a safe distance from the burning materials. Remember that the point of smoke emergence from a subsurface fire is not necessarily near the source of the fire. Smoke will follow the route of greatest permeability.
5. Cover the burning materials with ash, soil, or other acceptable material. The use of large quantities of water to smother and cool a landfill fire is not always successful, but may be used as a first step to prevent the spreading of flames.

7.16 Hazardous and Special Waste Handling and Exclusion Plan

JRL is not permitted to accept hazardous or toxic substances and can only dispose of MEDEP approved non-hazardous in-state solid or special wastes. Because JRL receives wastes such as MSW bypass and CDD from non-regulated residential sources, there is always the possibility that an unacceptable material may be found in the waste stream. Due to this possibility, NEWSME has instituted a waste inspection plan in order to assure that unacceptable materials are kept out of the incoming waste streams to the fullest extent possible. The waste inspection plan may be found in Appendix L.

7.16.1 Identification of Hazardous and Non-permitted Special Waste. Only haulers with wastes that have been pre-approved for disposal at the landfill are allowed access to the site. The scale house operator verifies that each load of waste material has been approved for disposal at the site. Deliveries entering the JRL that do not require pre-approval (i.e., MSW bypass, CDD) are monitored closely by NEWSME staff from arrival to offloading. As with every load, the landfill operators scan the deliveries as each load is being offloaded in order to assure that hazardous materials are not present. The waste is generally spread in 1- to 2-foot lifts such that

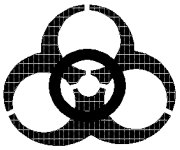
non-permitted materials will be more easily noticed. If a suspected non-permitted special or hazardous waste is observed during this process, the operator will stop operations and safely inspect the suspicious material to verify its acceptability. The driver of the vehicle that delivered the material will not be allowed to leave the landfill until it has been determined that the material is acceptable. The operator will try to safely identify labeling; determine if the waste is a solid, liquid, or gas; and estimate the quantity and condition of the material. If in the attendant's judgment the material in question could be hazardous, the Operations Manager will be notified, and the area will be secured and evacuated. Three of the more obvious hazardous materials that may pose a risk to personnel, if they should come into contact are as follows:

Non-Treated Biomedical Waste

Blood or body-fluid-containing material and needles or any sharp material (i.e., broken glass or any material that can cause puncture).

> Danger: Contact with a biohazard could result in contacting the HIV or HBV virus. Any red trash bag that comes from doctors' offices that has bio-hazardous material inside will have a biohazard symbol on the outside of the bag. Employees are advised that if they come across a red bag with this symbol on the side, they shall NOT pick it up.

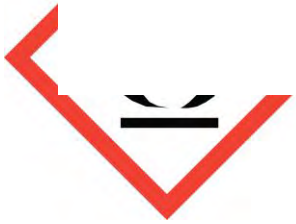
The symbol looks like this:



Flammable Substances

Flammables can come from many different sc ntainers of gasoline. Employees are advised to be awar type of symbols on the label.

> Danger: Fires and burns.



Corrosive Materials

Corrosive materials can be very dangerous. They can cause serious burns, if you should come into direct contact. Battery acid in containers, leaking or not, is dangerous. Some cleaning fluids can be corrosive.

Danger: Serious burns.

Hazardous Materials Mixed with Construction & Demolition Debris

If personnel come in contact with any hazardous material, they will need to isolate it. If it is still in the container or on the truck, it will be the responsibility of the generator or the hauler to take the material with them when they leave the landfill.

If the material has been unloaded and the employees have not been exposed, they shall isolate the material by rope or hazard tape. They will then contact the ECM and FM/ET, so that they can further identify the material, if necessary. If necessary, an appropriate hazardous materials contractor will be called in to manage and dispose of the material.

If the employees have been exposed to the material, they will be sent to NEWSME's preferred health care provider. The material will be identified as soon as possible, and the information will be sent to the health care provider. NEWSME will then identify the source of the material and take action to correct the problem, including turning over the matter to the authorities. Costs for cleanup will be the responsibility of the generator.

7.16.2 Handling of Hazardous or Non-permitted Special Waste. At JRL, non-permitted materials that are visually identifiable as posing no immediate threat to employees will be segregated and removed to containers supplied by the facility. Unidentified potentially hazardous materials will be left where discovered and the Operations Manager, ECM, and/or FM/ET will be contacted to coordinate the proper handling and disposal of the material. If it has been determined by the ECM that a hazardous waste is, or has the potential to impact human health or the environment through leakage, they will, in addition, immediately notify MEDEP's Emergency Spill Unit (1-800-482-0777), the National Response Center (1-800-424-8802), the Old Town Fire Department (207-827-3400), and the Maine State Police (1-800-452-4664).

7.16.3 Storage, Transportation, and Disposal of Hazardous or Non-permitted Special Waste. Storage of non-permitted wastes at the landfill is not allowed by NEWSME. Visually identifiable non-hazardous waste will be removed and immediately directed to appropriate solid waste containers. The ECM will be responsible for coordinating disposal of the material. Only personnel from companies contracted with NEWSME (e.g., Clean Harbors, EPI) who are trained in the proper handling and management of hazardous waste will be permitted to perform

cleanup or decontamination of hazardous waste on-site. They will provide the necessary protective clothing, breathing apparatus, containment and removal equipment, and other supplies appropriate to the handling of the hazardous waste involved.

Interim on-site storage of hazardous waste will not be utilized. Containers for the containment and removal of hazardous waste will have warning labels as required. The removal contractor will be responsible for removing contaminated clothing and disposables from the JRL site along with the hazardous waste. Arrangements for transport and ultimate disposal of potentially hazardous materials will be undertaken immediately by the ECM. Only transporters certified in the transportation of hazardous materials and licensed disposal sites will be employed.

7.16.4 Emergency Notification Procedures. Emergency notifications from the landfill will be made to the Operations Manager via radio communication, cellular phone, telephone maintained in the landfill's equipment garage, or any other appropriate means. Subsequently, the ECM and General Manager will be notified by the Operations Manager. The following telephone numbers are available at JRL for responsible personnel to use in emergency situations:

- MEDEP Bureau of Remediation and Waste Management: 941-4570
- MEDEP Emergency Spill Number: 1-800-482-0777
- National Response Center: 1-800-424-8802
- Old Town Fire Department: 827-3400 or 911
- Old Town Police Department: 827-3400 or 911
- Ambulance: 827-3400 or 911
- Maine State Police: 1-800-452-4664
- Maine Poison Center: 1-800-442-6305
- Eastern Maine Medical Center: 973-7000

7.16.5 Written Reports. Within 15 days of any incident involving a hazardous material, a written report will be filed with the MEDEP Bureau of Remediation and Solid Waste Management, and will include the following information:

- date and time of incident,
- location,
- description of unacceptable material,
- amount of unacceptable material,
- cause of incident,
- corrective actions taken,
- clean-up methods used,
- disposition of recovered material,
- list of agencies notified, and
- time agencies responded on-site.

Please reference Appendix M, Facility Notification Procedures, for complete emergency notification details.

7.17 Litter Control Plan

NEWSME places daily cover on all active portions of the landfill at the end of each workday to control windblown litter. A series of litter control fences are also installed around each active operating area of the facility to manage and control litter. NEWSME also contracts with a temporary labor agency that provides routine litter patrols that pickup and clean around the facility on an as needed basis.

7.18 Environmental Monitoring Plan

The Expansion Environmental Monitoring Plan (EMP) for the JRL facility is found in Appendix I of this Manual. This plan describes the proposed monitoring locations, analytical parameters and sampling and reporting procedures associated with the Expansion.

7.19 Geotechnical Monitoring Plan

The current Geotechnical Monitoring Plan for the JRL may be found in Appendix N of this Manual.

7.20 Operation Records

Operational records will be maintained for the facility and will primarily consist of the following:

- Waste types and volumes received
- Equipment operation and maintenance
- Leachate management
- Inspection reports
- Equipment and personnel
- Unusual operating events

In addition, copies of annual reports submitted to the Department shall be kept on file and/or made available electronically, as requested.

7.21 Operation of Waste Storage and Processing Areas

Only MEDEP approved waste storage and/or processing areas are allowed outside of the landfill's solid waste boundary. JRL has a MEDEP approved clean wood waste storage pad located adjacent to the current solid waste boundary. Clean wood waste, clean construction debris, brush, stumps, and railroad ties are received at the location, then the wood waste is chipped or shredded for use at the landfill or for wood fuel.

7.22 Vector Control

Vectors are controlled at JRL by assuring that all waste materials within the active portions of the landfill are appropriately covered each workday. Additionally, NEWSME maintains a contract with Modern Pest Control to supply vector control services on an ongoing basis. Birds

are controlled by regularly deploying lethal depredation methods, as well as non-lethal methods to scare the birds off the site.

7.23 Additional Requirements for Disposal of Asbestos

JRL only accepts non-friable asbestos, primarily consisting of roofing, siding, and soil contaminated with non-friable material. The non-friable asbestos received at the JRL facility is handled in accordance with MEDEP Asbestos Management Rules, then deposited in the landfill and covered to prevent airborne contaminants during compaction.

7.24 Winter Weather Operations

During winter operations, special planning and scheduling considerations by the Operations Manager and equipment operator will be required. Snow removal, shorter days, placement of temporary cover, removal of temporary diversion berms, and equipment preparation and starting are the major considerations that shall be planned.

Prior to and during landfill operating hours, the access road, perimeter road, and interior roads shall be plowed and sanded. Special consideration shall be given to sharp curves and narrow perimeter roads to prevent users from sliding into the perimeter ditches.

Installation of intermediate cover material during the winter months shall be avoided, unless damaged areas require immediate attention or nuisance odors dictate response actions. If the installation of intermediate cover is required in the winter months, it will be necessary to remove accumulated snow from the waste surface prior to application of the cover. Safety of the workers deploying the cover material will require special attention. The nature of the synthetic material and frozen and slippery surfaces will dictate installation procedures.

Operations of the leachate collection and transport system are of particular importance during the winter months. Facility staff shall pay close attention to the performance of the system. Prior to the onset of cold weather, the operator shall ensure that an adequate frost protection layer is placed over the leachate collection systems (in a new cell not being operated) in order

to provide an insulating layer to keep the system from freezing. Also, surface water drainage and leachate structures shall be kept clear of snow and ice such that they remain free flowing, particularly during spring thaw conditions.

7.25 Odor Control

NEWSME has developed an Odor Control Plan to manage and mitigate nuisance odors at JRL. The current version of the JRL Odor Control Plan may be found in Appendix K.

7.26 Liner Action Plan

The Expansion cells have a dedicated leak detection system which is used to monitor the performance of the primary liner system. A Liner Action Plan (LAP) which describes the procedures to monitor the leak detection system and appropriate, trigger response activities in the event a leak of potentially significant environmental consequences is included in Appendix P.

8.0 FACILITY INSPECTION AND MAINTENANCE

Proper operations of the landfill require that routine inspection and monitoring be performed on-site to ensure that facility components are operating properly. This section describes the schedule and procedures that the operator shall follow to keep the landfill functioning as designed. These recommended schedules for inspection and monitoring are considered a minimum. If unusual events or observations occur, the operator shall check systems that may be affected prior to resuming normal operations. Inspection forms for the JRL facility are included in Appendix O. The following descriptions explain the components of the facility that shall be checked.

8.1 Inspection Frequency

Table 8-1 summarizes the items to be checked and the inspection frequency for the various landfill facilities and components. In addition, NEWSME personnel shall observe site conditions and report immediately unusual conditions to the Operations Manager as part of routine operations. Included in Appendix O are inspection checklists for the various site facilities. The completed checklists shall be maintained on file at the facility. The remainder of this section describes what shall be checked for the individual locations at the facility.

TABLE 8-1

FREQUENCY OF ROUTINE LANDFILL SYSTEM INSPECTIONS

	Weekly	Monthly	Quarterly	Annual[1]
Leachate Collection Piping and Inlet Structures			X	
Leak Detection System		X		
Surface Water Inlets & Outlets	X			
Pump Stations	X			
Force Main Pressure Gauges, Air Release, Valves and Sewer Manholes			X	X
Gas Management Piping		X		
Leachate Force Main Shut Off Valves				X
Surface Drainage Ditches & Downspouts	X			
Access Roads – Mud	X			
Access Roads - Pavement/Rutting	X			
Landfill Covers				
Daily Cover	X			
Intermediate Cover	X	X		
Final Cover			X	
Erosion Control Structures	X			
Leachate Storage Tank and Loading Facilities	X			
Stormwater Detention Basin	X			

Note:
1. Annual inspection to be performed at location which require confined space entry procedures

8.2 Leachate Collection and Leak Detection

Inspection of the leachate collection, and leak detection piping system shall include regular observation of the ditches within the landfill cell for signs of ponding leachate, and review of the pumping volumes at both the leak detection and leachate pump stations for indications of unusual changes in volume that are not the result of weather conditions. If restrictions of leachate flow are indicated by either of these inspection methods, clean-out covers along the leachate lines shall be removed and the inspector will listen for the sounds of flowing fluids. This may give an indication of the location of any blockages. When a blockage is located, the affected lines shall be cleaned utilizing conventional sewer cleaning equipment. If increase flows are noted in the leak detection system, the cleanouts for the leak detection system should be used to check for potential sources of the increased leak detection flows. This can be done by using a camera inserted in the leak detection pipes through the cleanouts to observe leachate flows. Other sources of flow to the leak detection system should also be investigated. This includes but is not limited to damage to the liner system along the perimeter of the landfill.

8.3 Former Leachate Pond Leak Detection

Inspection of the former leachate pond's leak detection and underdrain system shall include observations of the system outlets for flow and monitoring water quality of the discharge on a monthly basis for field parameters, as described in the site's current EMP.

While the former leachate pond is no longer being utilized for the storage of leachate, it will be used for stormwater management.

8.4 Pump Stations and Force Mains

Pump station inspections shall include: observation of the control panel to assure that pumps and the flow meter are operating correctly, operating valves to assure they are functioning, and observation of the flow into the station, the condition of the equipment and supports (i.e., corrosion or loose connections), and the operation of the flow meter. During the inspection, power to the pumps will be shut off and all gate-type valves within and entering the station will be opened and closed (or closed and opened) to keep the closure mechanisms from freezing due to corrosion. The operation will be done in a manner that will not result in a discharge of leachate to the environment.

Force main inspection shall consist of a check of the pressure gauges (where applicable) at each manhole in the force mains, and confirmation that the air release valves are working. A high reading in the pressure gauges may be indicative of a leak in the force main. Any leakage detected shall be reported immediately to the ECM. If a high gauge reading is noted, the pressure between the pipes shall be released and a check made to see if the pressure is the result of a leak. If not, the gauge shall be replaced and rechecked daily until the problem is identified and solved, or until the high pressures are no longer noted. If the high pressure is the result of a leak, the affected pipeline shall be repaired.

8.5 Leachate Storage Tank and Loading Rack

The leachate storage tank and associated systems shall be inspected for possible leaks, corrosion of tank parts, icing of inlets and outlets, uneven settlement of tank foundation, and erosion or damage to the secondary containment system. Apparent structural failure of the tank and/or the foundation shall be reported immediately to the General Manager. Leaks detected shall be reported to the ECM. The leachate storage tank is equipped with leak detection piping at the base of the tank. These leak detection pipes shall be checked for sign of leakage. If any fluid is observed in the piping system, it shall be reported immediately to the ECM. The specific conductance of the fluid shall also be measured. An Operations and Maintenance Manual for the leachate storage tank is attached in Appendix H.

8.6 Annual Inspection of Leachate and Leak Detection Collection Piping and Leachate Transport Piping

NEWSME will complete an annual inspection of the leachate and leak detection collection and leachate transport lines. The inspection will include a systematic review of the flow data from the facility, and visual inspection of the inlets and outlets of the piping systems and manual opening and closing of the leachate control valves. If these inspections suggest a blockage is occurring in these lines, the lines will be cleaned using conventional sewer cleaning equipment. Notwithstanding, NEWSME will implement a periodic cleaning of the leachate collection and transport piping systems on-site. Leachate lines will be cleaned at a minimum once every five years during operation. If necessary, more frequent cleaning will occur.

8.7 Active Gas Management System

Gas piping system components consist of laterals and gas extraction wells, horizontal gas collection, gas conveyance piping, knockout structures, and a blower and flare station. Inspection and maintenance of this system shall be done in accordance with the active gas monitoring and maintenance manual included as Appendix J. For landfill gas treatment, please refer to the Thiopaq Operations and Maintenance Manual included as Appendix Q and the JRL RNG Gas Treatment System Monitoring and SSM Plan as Appendix R.

8.8 Surface Drainage System and Erosion Control

The surface drainage systems around the perimeter of the landfill shall be inspected for sediment or vegetation buildup and undermining of the ditches, which could adversely affect the flow of water in the ditch.

The upslope stormwater diversion ditches and berms shall be checked regularly to ensure that they are conveying water away from operational areas of the landfill. The entire length of these facilities shall be checked for signs of ponding water or breaches in the temporary covers. Repairs shall be made to the area as soon as possible.

8.9 Stormwater Detention Basins

The storm water detention basins require weekly inspections. Inlets into the basin shall be free of litter, silt, and other debris that may block the inlets. Silt that builds up in the base of the basin shall be removed on as needed to maintain State of Maine Stormwater BMPs. Silt shall not be allowed to build up and smother vegetation. The detention basin outlet control structure shall be kept free of litter, silt, and other debris that may block the openings.

8.10 Access Roads

Access roads will require inspections for breakup of the paved road surface or rutting of gravel access ways. Repairs to the access roads will be made as necessary. Periodic sweeping will prevent mud from being tracked onto site access roads.

8.11 Daily Cover

The daily cover shall be inspected at the beginning of each operational day for its effectiveness in controlling odors and windblown debris. If the cover material is not effectively controlling these conditions, changes shall be made to the type or amount of daily cover being used.

8.12 Intermediate Cover

Intermediate cover shall be inspected regularly. Inspections of any synthetic materials shall include observations of rips or holes and anchoring of material. Holes shall be repaired with a patch or seam stitching. The repairs shall be done by an individual with prior experience or training in the handling of this material. If the intermediate cover is soil, it shall be checked for presence of erosion or vegetation kill.

8.13 Landfill Expansion Cells – Leak Detection System

The Expansion cells will have leak detection systems. These systems will allow the performance of the primary liner to be monitored. This section describes the layout of the Expansion's proposed leak detection system, and leak detection monitoring program. The base cells of the JRL Expansion have been designed with a leak detection system located between the primary and secondary liners. This system is the main means for monitoring the performance of the primary liner system. The leak detection system consists of components similar to the leachate collection system. Over the base of the cells, the leak detection system consists of a geocomposite drainage net and one foot of sand; collection pipes are located in the sand. On the sideslope areas, the leak detection system consists of a geocomposite drainage net. The discharge and collection of the leak detection system fluid for the Expansion cells will occur in the individual cells' pump stations. Monitoring of leak detection flows, leak action rates, response actions and reporting requirements for the Expansion cells' leak detection system are defined in the LAP included in Appendix P.

9.0 RECORDKEEPING AND TRAINING

As part of landfill operations, records shall be kept of various site activities (Table 9-1). The purposes of the record keeping are to allow future strategic site planning and to comply with the MEDEP reporting requirements.

TABLE 9-1

OPERATION RECORDS SCHEDULE

	Daily	Weekly	Monthly	Annual
Waste volumes	X		(tabulated)	(tabulated)
Waste disposal area			X	
Equipment inspection	X			
Leachate flow			X	(tabulated)
Gas flows			X	
In-place volume survey				(as needed)
Unusual operating events				(tabulated as required)
Operator training			X	
Leak detection System			X[1]	

Note:
1. See LAP included in Appendix P.

9.1 Construction

Construction activities related to major improvements to the landfill associated with operation of the cells shall be documented by preparing as-built drawings and a final construction report, which contains all quality assurance/QC testing, and documentation of the construction site activities.

Construction activities include a new landfill area, final covers, pump stations, force mains, or other components of the landfill. Copies of construction reports will be kept on file by the ECM.

9.2 Operations

Records of the landfill operation shall be maintained as described in the following subsections and according to the schedule shown in Table 9-1. These records shall be kept up to date and available for review by MEDEP. Typical reporting forms used at the landfill may be found in Appendix O.

9.2.1 Waste Volumes. A record of the quantity of wastes and cover material placed at the landfill will be maintained based on the volume or weight of materials brought to the landfill. These records will be tabulated on a monthly basis by waste category and origin and included in the annual report for the facility. The in-place and remaining available volume of the landfill will be estimated by a topographic survey of the facility, typically each quarter. This survey will provide a check on the amount of material landfilled, as well as provide an estimate of the amount of consolidation that has occurred and document the portion of the landfill used. This information will be used to project the remaining life in the cells.

9.2.2 Equipment Operation and Maintenance. Verbal reports describing equipment problems that may affect the operation or environmental integrity of the landfill, either by the nature of the problem or by delays caused as a result of the problem, will be reviewed with the General Manager during routine operation meetings.

9.2.3 Leachate Management. Leachate flows shall be reviewed as a check on the operation of the facility. An annual summation of the amount of leachate pumped from the leachate systems will be included in the annual report. Problems with the leachate collection system that may result in a discharge of leachate to the environment will be promptly reported to the General Manager and ECM, who will report discharges to MEDEP.

9.2.4 Inspection Reports. The ECM and FM/ET are responsible for completing inspections of the site and its various components. Copies of the inspection reports will be maintained by the ECM.

9.2.5 Unusual Operating Events. A record of any unusual operating events such as fires; significant deviations from the operating plan; spills of waste, fuel, or hydraulic fluid; or reports of any accidents at the landfill facility will be made by the Operations Manager, and a copy sent to the ECM and General Manager. If any of these events cause an adverse environmental impact, the ECM or General Manager will promptly notify MEDEP. Significant deviations from the operating plan will be included in the annual report to MEDEP.

9.2.6 Leak Detection Monitoring. The leak response and reporting requirements for the Expansion cells are described in the LAP. The LAP for the JRL may be found in Appendix P of this Manual.

9.3 Annual Report

An annual report will be prepared and submitted to MEDEP, and will include the following information:

- a summary of the type, quantity, and origin of waste required,
- estimates of the capacity of the landfill used during the past year and the remaining capacity,
- a description and estimate of the amount of cover material used in the past year,
- a description of changes in the Operations Manual during the past year,
- proposed changes to the Operations Manual or other aspects of the landfill's operations,
- a summary of leachate quality and quantity, including a comparison with the previous year's data,
- a summary of the leak detection system monitoring,
- a summary of any changes made or proposed to either the Environmental Monitoring Plan or the Geotechnical Monitoring Plan,
- a summary of landfill gas monitoring, including a comparison with the previous year's data,
- a summary of the periodic facility systems inspections,
- a summary of geotechnical monitoring for the year,

- an internal evaluation of the landfill's operations to verify that the facility is operating in compliance with the Operations Manual and other applicable requirements,
- a summary of spills, fires, accidents, and unusual events that occurred at the landfill in the past year,
- updated Cell Development Plans for subsequent two-year periods, as needed, highlighting any changes to the approved plan,
- copies of reports prepared in accordance with the JRL's Hazardous and Special Waste Exclusion Plan,
- results from the inspections and testing required by the facility's permit, including a report stating the date and findings associated with the annual inspection and cleaning, if necessary, of the leachate collection, detection, and transport systems, and
- a description of system failures and documentation of repair measures.

The appropriate annual report fee shall be submitted, as determined by the MEDEP.

9.4 Operations Manual Control Copy

To record changes to operating procedures at the JRL, a copy of the Operations Manual, updated with any changes in landfill operations, will be kept at the ECM's office. The ECM will also be responsible for assuring that all facility personnel are made aware of MEDEP approved changes to the Operations Manual.

10.0 ACCIDENT PREVENTION AND SAFETY

NEWSME maintains a Landfill Safety Manual that can be found in the Operations Manager's Office. Personnel associated with operation of the landfill shall be familiar with the Manual. Questions related to site safety and accident prevention shall be directed to the NEWSME Site Safety Officer.

11.0 EMERGENCY PROCEDURES

Emergency procedures can be found in Appendix M, Facility Notification Procedures. These procedures also can be adapted to other similar possible emergencies.

12.0 COMPLAINT MANAGEMENT AND RESPONSE PLAN

The Odor Complaint Management and Response Plan can be found in Appendix K of this manual. NEWSME has a dedicated incoming phone line for complaints from the public related to any aspect of the JRL operations. The complaint number is 207-394-4376. The scale house operator answers this number during working hours 7 days per week. During non-working hours, the complaint line is transferred to a dedicated cellular phone in the possession of the on-call response individual. The following information will be gathered from any users of the complaint number:

- Name, address, and telephone number
- The type of complaint (odor, noise, lighting, dust, etc.)
- What time of day did they first experience the source of their complaint
- Whether or not the source of the complaint was experienced at their residence

After this information is received, the NEWSME staff taking the call will immediately relay the information to the appropriate complaint response personnel (during working hours). During after hours, the designated response individual will be responsible for handling the complaint. An available member of the complaint response group will respond to complaints during working hours, as deemed necessary. If a return call has been requested, the on-call landfill staff will first telephone the person initiating the complaint. If a meeting has been requested, the landfill staff will ask permission to go to the residence to evaluate site-specific information.

Whether or not the landfill personnel meet directly with the individual initiating the complaint, the landfill personnel upon receiving the call from the scale house operator will immediately gather and record the following information at the JRL site and vicinity as relevant to the complaint:

For odor complaints:

- Time of arrival at the location of the complaint (if applicable).
- Recorded wind direction and speed at the landfill.
- H2S level registered at the complaint address, if site visit is performed.

- Observation of unusual conditions present at the landfill prior to or during the time of the complaint.

For all complaints:

- Scale house records regarding truck activity if complaint is noise.
- Observed lighting conditions if complaint is lighting.
- Actions taken to remedy cause of the complaint.
- Resolution of the complaint.
- Time and comments made in reporting back to caller.
- Comments made by caller during final exchange.

If a complaint about dust, litter, and debris is received at JRL, the General Manager will, within 24 hours of receiving the complaint, be responsible for reviewing the operations to determine the source of the dust emissions. Once the source is determined, the General Manager will direct the action required to rectify the problem. If the source of the dust is from a paved surface, the surface will be swept. If the source is from a mineral surface, water will be applied to the surface. The General Manager will assess the dust emission source and determine if routine preventive measures are required to prevent future emissions.

If a complaint about light levels at the site is received by NEWSME, the General Manager will be responsible for determining the source of the light overspill. Corrective action such as turning off unneeded lights, reducing the light wattage, or adding additional cutoffs will be directed by the General Manager if deemed necessary.

If a complaint about pests around the site is received, within 48 hours of receiving the complaint the General Manager will address the issue (e.g., contact a licensed exterminator to rectify the immediate problem) if deemed necessary. The General Manager will also review the operating procedures to determine if operational changes are required to prevent future problems.

If a complaint about noise is received by NEWSME, the General Manager will be responsible to investigate the complaint and determine the source of the noise. Once the source is

determined, the General Manager will review the operating procedures to assure that the equipment is in good mechanical condition and is being operated properly.

NEWSME is required to operate its facilities in accordance with noise regulations in MEDEP's Solid Waste Rules. These regulations limit the hourly equivalent operating sound limit to 60 dBA during daytime hours from 7:00 a.m. to 7:00 p.m. and 50 dBA during nighttime hours from 7:00 p.m. to 7:00 a.m. at protected locations (i.e., properties occupied by residences).

If the General Manager determines that the facilities are being operated in accordance with the conditions of its approvals, and a second noise complaint is presented to NEWSME from the same complainant, the General Manager will, within 7 days of receiving the complaint, engage a noise consultant to measure ambient sound level at the location of the complainant's residence. If the sound level is within the regulatory limits, no further action is required by NEWSME. If it is found that the facilities are not operating under approved regulatory limits, NEWSME will, within 7 days of receiving the complaint, retain a noise consultant to evaluate the operations and determine what corrective steps are required to bring the facilities into compliance with the noise regulations. The corrective action shall be undertaken as soon as practical but in no case greater than 90 days from receipt of the noise consultant's report, sound levels will be retested within 7 days of completing the corrective action to verify the effectiveness of the corrective action.

REFERENCES

NEWSME Landfill Operations LLC, (April 2025). Juniper Ridge Landfill Expansion Operations Manual

NEWSME Landfill Operations LLC, (April 2024). Juniper Ridge Landfill Expansion Operations Manual

NEWSME Landfill Operations LLC, (April 2023). Juniper Ridge Landfill Expansion Operations Manual

NEWSME Landfill Operations LLC, (April 2022). Juniper Ridge Landfill Expansion Operations Manual

NEWSME Landfill Operations LLC, (April 2021). Juniper Ridge Landfill Expansion Operations Manual

NEWSME Landfill Operations LLC, (April 2020). Juniper Ridge Landfill Expansion Operations Manual.

NEWSME Landfill Operations LLC, (December 2019). Juniper Ridge Landfill Operations Manual.

NEWSME Landfill Operations, LLC, (July 2015). Juniper Ridge Landfill Expansion Application Volume IV Operations Manual.

APPENDIX A
MEDEP OPERATING PERMITS

Included are the following:

- **Updated list of all active licenses and permits**
- **Original James River Paper License #S-020700-7A-A-N (1993)**
- **Vertical Increase & Additional Waste Streams of Original 68 Acre Permitted Landfill Footprint Amendment #S-020700-WD-N-A (2004)**
- **Landfill Expansion License #S-020700-WD-BI-N (2017)**

Juniper Ridge Landfill active licenses and permits

JUNIPER RIDGE LANDFILL
MEDEP AIR LICENSES

TAB #	PERMIT NUMBER	ISSUE DATE	FACILITY / ENTITY	TYPE	DESCRIPTION
A-1	A-921-70-A-I	12/20/2005	WEST OLD TOWN LANDFILL	PART 70 AIR EMISSION LICENSE	TITLE V AIR LICENSE, LANDFILL, FLARE #1, FLARE #2
A-2	A-921-70-A-I - FLARE #3	12/6/2007	JUNIPER RIDGE LANDFILL	INSIGNIFICANT ACTIVITY	TEMPORARY OPERATION OF FLARE #3
A-3	A-921-70-A-I - FLARES #2 & 3	3/19/2008	JUNIPER RIDGE LANDFILL	INSIGNIFICANT ACTIVITY	OPERATION OF FLARES #2 & #3 TOGETHER
A-4	A-921-70-A-I - FLARE #4	11/17/2008	JUNIPER RIDGE LANDFILL	INSIGNIFICANT ACTIVITY	OPERATION OF FLARE #4
A-5	A-921-77-2-A	11/26/2012	STATE OF MAINE & NEWSME	NEW SOURCE REVIEW - MAJOR MODIFICATION	NSR #1 - CHAPTER 115 FLARE #4 (FLARE #2 & #3 BACKUP)
A-6	A-921-77-3-M	2/13/2014	STATE OF MAINE & NEWSME	NEW SOURCE REVIEW - MINOR REVISION	NSR #2 - TRS CONTROL EQUIPMENT INSTALLATION (SULFATREAT, THIOPAQ)
A-7	A-921-75-D-X	2/13/2014	STATE OF MAINE & NEWSME	SALES & USE TAX EXEMPTION	TAX EXEMPTION CERTIFICATION (SULFATREAT & THIOPAQ)
A-8	A-921-77-4-M	5/9/2014	STATE OF MAINE & NEWSME	NEW SOURCE REVIEW - MINOR REVISION	NSR #3 - MONITORING & SAMPLING
A-9	A-921-70-B-R	10/7/2014	STATE OF MAINE & NEWSME	PART 70 AIR EMISSION LICENSE RENEWAL W/AMENDMENT	RENEWAL OF PART 70 LICENSE
A-10	A-921-70-H-A	1/6/2021	STATE OF MAINE & NEWSME	PART 70 AIR EMISSION LICENSE AMENDMENT	AMENDMENT TO CLARIFY THE APPLICABILITY/COMPLIANCE OF FED. REGS
A-11	A-921-70-F-R	5/24/2021	STATE OF MAINE & NEWSME	PART 70 AIR EMISSION LICENSE RENEWAL	RENEWAL OF PART 70 LICENSE Expires 05/24/26
A-12	A-921-77-6-A	12/8/2023	STATE OF MAINE & NEWSME	NEW SOURCE REVIEW	NSR #6 - FINDING AND FACT ORDER INTERMITTENT TO CONTINUOUS PILOT ON FLARE #4
A-13	A-921-70-I-A	1/26/2024	STATE OF MAINE & NEWSME	PART 70 AIR EMISSION LICENSE AMENDMENT #1	INTERMITTENT TO CONTINUOUS PILOT ON FLARE #4, UPDATES ON VISIBLE EMISSIONS REGULATIONS

JUNIPER RIDGE LANDFILL

VECTOR CONTROL PERMITS

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
V-1	MB670894	RENEWED ANNUALLY	CASELLA WASTE SYSTEMS	FEDERAL FISH AND WILDLIFE PERMIT	DEPREDATION PERMIT (Expires 12-31-26)
V-2	U00606	RENEWED EVERY THREE YEARS	JUNIPER RIDGE LANDFILL	MAINE DEPARTMENT OF PUBLIC SAFETY	EXPLOSIVES PERMIT - BIRD BANGERS AND POPPERS (Expired not renewed)

LEACHATE DISPOSAL PERMITS

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
L-1	37-2679-07	(02/08/2018)	NEWSME, LLC.	INDUSTRIAL WASTEWATER DISCHARGE PERMIT	CITY OF BREWER WASTEWATER DISCHARGE PERMIT (Expired 02/07/23 (not renewed)
L-2	NA	EXECUTED ON 10-27-23/SIGNED 10-30-23. (NEW TESTING REQ. STARTED Q1-2020)	NEWSME/ND PAPER	LEACHATE DISPOSAL	ND PAPER LEACHATE DISPOSAL AGREEMENT Expires 10/27/26

STORMWATER PERMITS

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
S-1	MER05B477	1/3/2006, NOI UPDATE 7/15/11 & 3/1/17	NEWSME LANDFILL OPERATIONS, LLC	MULTI-SECTOR GENERAL PERMIT	INDUSTRIAL STORMWATER PERMIT Permit shield - Awaiting MEDEP for issuance of new Multi-sector Permits

AGRONOMIC UTILIZATION LICENSES

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
AU-1	S-022376-SG-B-A	10/21/2015	NEW ENGLAND WASTE SERVICES	AMENDMENT (TO PTL LICENSE)	JRL THIOPAQ AGRONOMIC SULFUR UTILIZATION

CITY OF OLD TOWN

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
OT-1		11/14/2017	NEWSME LANDFILL OPERATIONS, LLC	CHAPTER 24 LICENSE	SOLID WASTE FACILITY PERMIT (EXPANSION)
OT-2		10/11/22 Planning Board Approval	ARCHAEA ENERGY/NEWSME LANDFILL OPERATIONS, LLC	CHAPTER 24 LICENSE	RENEWABLE NATURAL GAS FACILITY APPROVAL

ARMY CORPS OF ENGINEERS

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
ACE-1	NAE-1991-1909-MI	11/14/2017	NEWSME LANDFILL OPERATIONS, LLC	ARMY CORPS WETLANDS PERMIT	ARMY CORPS WETLANDS EXPANSION PERMIT

JUNIPER RIDGE LANDFILL

MEDEP SOLID WASTE LICENSES - ALL

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
1	S-020700-7A-A-N	7/28/1993	JAMES RIVER PAPER	NEW LICENSE - FINDINGS OF FACT AND ORDER	WEST OLD TOWN SECURE LANDFILL FACILITY - **ORIGINAL LICENSE**
2	S-020700-WD-B-C	3/10/1994	JAMES RIVER PAPER	CONDITION COMPLIANCE	SPECIAL CONDITIONS #19 AND #20
3	S-020700-WD-E-C	4/23/1996	JAMES RIVER PAPER	CONDITION COMPLIANCE	CELL 1 CONSTRUCTION
4	S-020700-WD-F-C	5/6/1996	JAMES RIVER PAPER	CONDITION COMPLIANCE	SPECIAL CONDITION #13, LINER INSTALLATION QUALIFIED INSTALLERS
5	S-020700-WD-H-M	7/21/1999	FORT JAMES OPERATING COMPANY	MINOR REVISION	SECOND SEDIMENTATION POND
6	S-020700-WZ-I-N	10/1/1999	FORT JAMES CORPORATION	NEW LICENSE	PILOT PROJECT - BULKING SLUDGE STABILITY
7	S-020700-WD-J-M	6/7/2000	FORT JAMES OPERATING COMPANY	CONDITION COMPLIANCE & MINOR REVISION	CONSTRUCTION OF CELL 2
8	S-020700-WD-K-M	5/30/2001	FORT JAMES OPERATING COMPANY	CONDITION COMPLIANCE & MINOR REVISION	CELL 2 OPERATION
9	S-020700-WU-L-N	1/22/2002	GEORGA-PACIFIC CORPORATION	NEW LICENSE	CITY OF OLD TOWN TRANSFER STATION BURN PILE / HOT LOAD ASH
10	S-020700-WR-M-T / L-019015-TH-C-T	10/21/2003	STATE PLANNING OFFICE	LICENSE TRANSFER	TRANSFER OF LICENSES, COND. COMPL., APPS., CERTS.
11	S-020700-WD-N-A	4/9/2004	STATE PLANNING OFFICE	AMENDMENT	VERTICAL INCREASE & ADDITIONAL WASTE STREAMS - **LICENSE AMENDMENT**
12	S-020700-WD-O-M	3/12/2004	STATE PLANNING OFFICE	MINOR REVISION	ADDITIONAL ASH SOURCES
13	S-020700-WD-P-M	6/13/2005	STATE PLANNING OFFICE	CONDITION COMPLIANCE & MINOR REVISION	CELL 3A CONSTRUCTION
14	S-020700-WD-R-M	5/1/2006	STATE PLANNING OFFICE	MINOR REVISION	STORMWATER MANAGEMENT IMPROVEMENTS

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
15	S-020700-WD-S-M	7/27/2006	STATE PLANNING OFFICE	CONDITION COMPLIANCE & MINOR REVISION	CELL 3B CONSTRUCTION
16	S-020700-WT-V-N	9/14/2006	STATE PLANNING OFFICE	NEW LICENSE	SOUTH PARIS TANNERY SLUDGE & SOIL
17	S-020700-WT-Y-N	2/20/2007	STATE PLANNING OFFICE	NEW LICENSE	BRUNSWICK NAVAL AIR STATION NON-HAZARDOUS DEBRIS & SOILS
18	S-020700-WT-Z-M	3/14/2006	STATE PLANNING OFFICE	MINOR REVISION	SOUTH PARIS TANNERY SLUDGE & SOIL REVISION
19	S-020700-WD-LC-M	3/10/2008	STATE PLANNING OFFICE	MINOR REVISION	EXPAND LANDFILL GAS MANAGEMENT SYSTEM
20	S-020700-WT-AA-N	9/10/2007	NEWSME LANDFILL OPERATIONS, LLC.	NEW LICENSE, PLUS CORRECTED COPY	CUTLER NAVAL AIR STATION PETROLEUM CONTAMINATED SOILS
21	S-020700-WT-AC-M	2/5/2008	NEWSME LANDFILL OPERATIONS, LLC.	MINOR REVISION, PLUS CORRECTED COPY	BRUNSWICK NAVAL AIR STATION NON-HAZARDOUS DEBRIS & SOILS
22	S-020700-WD-AB-M	6/30/2008	STATE PLANNING OFFICE	CONDITION COMPLIANCE & MINOR REVISION	CELL 4 CONSTRUCTION
23	S-020700-WH-AF-E	4/22/2009	STATE PLANNING OFFICE	NEW LICENSE	SOLID WASTE TRANSFER STATION
24	S-020700-WD-T-C	6/15/2009	STATE PLANNING OFFICE	CONDITION COMPLIANCE	CONDITION #21 COMPLIANCE - NOISE STUDIES
25	S-020700-WD-AH-M	6/19/2009	STATE PLANNING OFFICE	CONDITION COMPLIANCE & MINOR REVISION	CELL 5 CONSTRUCTION
26	S-020700-WT-AI-N	9/17/2009	STATE PLANNING OFFICE	NEW LICENSE	BANGOR NON-HAZARDOUS SOIL & DEBRIS (DREDGED SPOILS)
27	S-020700-WT-AL-N	11/4/2009	STATE PLANNING OFFICE	NEW LICENSE	BREWER LEAD IMPACTED SOIL
28	S-020700-WU-AN-N	3/1/2010	STATE PLANNING OFFICE	NEW LICENSE	PINE TREE WASTE OILY DEBRIS
29	S-020700-WT-AQ-N	4/15/2010	STATE PLANNING OFFICE	NEW LICENSE	BRUNSWICK NAVAL AIR STATION LEAD PAINT SOIL
30	S-020700-WU-AP-N	5/21/2010	STATE PLANNING OFFICE	NEW LICENSE	NEW ENGLAND WASTE SERVICES SULFUR WASTES

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
31	S-020700-WU-AJ-N	6/30/2010	STATE PLANNING OFFICE	NEW LICENSE	TREATED BIOMEDICAL WASTE
32	S-020700-WT-AR-N	7/21/2010	STATE PLANNING OFFICE	NEW LICENSE	HOWLAND TANNERY SLUDGE
33	S-20700-WD-AO-M	8/13/2010	STATE PLANNING OFFICE	CONDITION COMPLIANCE & MINOR REVISION	CELL 6 CONSTRUCTION
34	S-020700-WD-W-M	9/10/2010	STATE PLANNING OFFICE	MINOR REVISION	MSW BYPASS LIMIT (MSW BYPASS FOR SOFT LAYER)
35	S-020700-WH-AV-M	10/28/2011	STATE PLANNING OFFICE	MINOR REVISION	SOLID WASTE TRANSFER STATION-RAILROAD TIES
36	S-020700-WD-AT-M	6/24/2011	STATE PLANNING OFFICE	CONDITION COMPLIANCE & MINOR REVISION	CELL 7 CONSTRUCTION
37	S-020700-WT-AX-N	10/28/2011	STATE PLANNING OFFICE	NEW LICENSE	CUTLER NAVAL AIR STATION CONTAMINATED SOILS
38	S-020700-WT-AW-N	11/7/2011	STATE PLANNING OFFICE	NEW LICENSE	BASF CONTAMINATED SOILS
39	S-020700-WD-U-C	11/28/2011	STATE PLANNING OFFICE	CONDITION COMPLIANCE	CONDITION #4 - CELL 3B OPERATIONS
40	S-020700-WD-AS-M	11/28/2011	STATE PLANNING OFFICE	MINOR REVISION	MODIFICATIONS TO ACTIVE GAS EXTRACTION SYSTEM
41	S-020700-WD-Q-C	11/28/2011	STATE PLANNING OFFICE	CONDITION COMPLIANCE	CONDITION #10 - OPERATIONS MANUAL APPROVAL
42	S-020700-WD-AY-M	9/4/2012	STATE PLANNING OFFICE	CONDITION COMPLIANCE & MINOR REVISION	CELL 8 CONSTUCTION
43	S-020700-W5-AU-N	1/31/2012	STATE PLANNING OFFICE	PARTIAL APPROVAL - PUB. BEN. DETERMINATION	PUBLIC BENEFIT DETERMINATION - PARTIAL APPROVAL
44	S-020700-WD-AE-M	10/9/2012	STATE PLANNING OFFICE	MINOR REVISION	INTERMEDIATE COVER CHANGE
45	S-020700-WD-AG-M	10/9/2012	STATE PLANNING OFFICE	CONDITION COMPLIANCE & MINOR REVISION	CONDITION #7 – LEACHATE POND UNDERDRAIN DISCHARGE
46	S-020700-WD-BC-A	12/20/2013	BUREAU OF GENERAL SERVICES	AMENDMENT	ACCEPTANCE OF MUNICIPAL SOLID WASTE (MSW)

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
47	S-020700-WD-BF-C	2/27/2014	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	MSW AMENDMENT CONDITION #6 & #7
48	S-020700-WD-BH-C	10/7/2014	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	CONDITIONS #21, #22, #23 NOISE AND VISUAL
49	S-020700-WD-BE-M	3/3/2015	BUREAU OF GENERAL SERVICES	MINOR REVISION	LANDFILL GAS TREATMENT FACILITY
50	S-020700-WD-BD-C	3/25/2015	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	CELL 9 CONSTRUCTION
51	S-020700-WT-AD-N	9/8/2016	BUREAU OF GENERAL SERVICES	NEW LICENSE	BELFAST MGP CONTAMINATED SOILS
52	S-020700-WT-AE-N	10/7/2016	BUREAU OF GENERAL SERVICES	NEW LICENSE	LOUIS MACK SITE LEAD CONTAMINATED SOILS
53	S-020700-WD-BJ-C	4/25/2017	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	CELL 10 CONSTRUCTION
54	S-020700-WD-BI-N / L-19015-TG-D-N	6/1/2017	BUREAU OF GENERAL SERVICES	NEW LICENSE	**LANDFILL EXPANSION** (9.35 MCY) BOARD ORDER
55	S-020700-WT-BK-N	7/27/2017	BUREAU OF GENERAL SERVICES	NEW LICENSE	SANFORD CIRCUIT BOARD PROCESSING WASTE
56	S-020700-WD-BL-A	3/31/2018	BUREAU OF GENERAL SERVICES	AMENDMENT	ACCEPTANCE OF NON BYPASS MSW (DATE REVISION UNTIL MARCH 31, 2019)
57	S-020700-WT-BN-N	7/6/2018	BUREAU OF GENERAL SERVICES	NEW LICENSE	PIONEER PLASTIC CONTAMINATED SOILS
58	S-020700-WT-BO-N	9/11/2018	BUREAU OF GENERAL SERVICES	NEW LICENSE	WATERVILLE ARMORY TREATED BUILDING DEBRIS
59	S-020700-WT-BR-N	9/21/2018	BUREAU OF GENERAL SERVICES	NEW LICENSE	HANCOCK ELLSWORTH TANNERY TRENCH SOLIDS, HIDES, MISC DEBRIS
60	S-020700-WD-BM-Z	10/10/2018	BUREAU OF GENERAL SERVICES	FINDINGS OF FACT AND ORDER ON APPEALS	ACCEPTANCE OF NON BYPASS MSW (DATE REVISION UNTIL MARCH 31, 2020)
61	S-020700-WT-BS-N	10/23/2018	BUREAU OF GENERAL SERVICES	NEW LICENSE	UNUM BUILDING - PORTLAND PCB CONTAMINATED SOIL
62	S-020700-WT-BT-N	1/28/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	US NAVY - CUTLER LEAD PAINT CHIPS/GRAVEL/MISC.

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
63	S-020700-WT-BU-N	4/1/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	EMERA MAINE - BANGOR PCB IMPACTED CONCRETE
64	S-020700-WD-BP-M	4/11/2019	BUREAU OF GENERAL SERVICES	MINOR REVISION	CRM BYPASS & RESIDUE DISPOSAL IN THE LANDFILL EXPANSION
65	S-020700-WT-BV-N	6/3/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	HUHTAMAKI POLYETHYLENE & CELLULOSE TRIMMINGS
66	S-020700-WT-CA-N	11/27/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	SOUTHWEST HARBOR TREATED LEAD CONTAMINATED SOIL
67	S-020700-WS-BY-N	12/12/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	DUPONT NUTRITION - ROCKLAND FIRE BRICK
68	S-020700-WT-BX-N	12/18/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	GENERAL ELECTRIC - BANGOR SPENT FILTER SAND
69	S-020700-WD-BW-M	12/20/2019	BUREAU OF GENERAL SERVICES	MINOR REVISION	OBW INCREASE IN EXPANSION (FROM 65,000 TO 85,000 FOR YEAR 2020)
70	S-020700-WT-CC-N	2/10/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	GAC CHEMICAL CORP. - SEARSPORT GRAVEL, SOIL, RR BALL. STONE W/SIKA
71	S-020700-WT-CE-N	3/16/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	ROWE SCHOOL. - YARMOUTH SOIL IMPACTED W/ PULP SLUDGE & ASH
72	S-020700-WD-BZ-C	3/30/2020	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	ACCEPTANCE OF NON BYPASS MSW (6 MONTH EXTENSION UNTIL 09/30/20)
73	S-020700-WD-CB-C	4/30/2020	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	CELL 12 CONSTRUCTION CONDITION #5 (LICENSE #S-020700-WD-BI-N)
74	S-020700-WT-CF-N	5/6/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	ST. JOHN'S CHURCH - SOUTH PORTLAND PCB/LEAD PAINT BUILDING DEBRIS
75	S-020700-WT-CH-N	7/10/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	SOUTHWEST HARBOR LEAD STABILIZED SOIL
76	S-020700-WT-CJ-N	10/2/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	MT. ARARAT HIGH SCHOOL - TOPSHAM PCB CONTAMINATED PLYWOOD
77	S-020700-WT-CI-N	10/2/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	FIBER MATERIALS - BIDDEFORD GRAPHITE & CARBON DUST
78	S-020700-WT-CK-N	12/3/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	CMP UTIL. POLE STORAGE AREA - BRIDGTON CONTAMINATED SOIL

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
79	S-020700-WU-CD-N	12/16/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	VARIOUS SPECIAL WASTES & REVISIONS TO ON-GOING SPECIAL WASTE LICENSES
80	S-020700-WD-CL-C	5/25/2021	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	CELL 13 CONSTRUCTION CONDITION #5 (LICENSE #S-020700-WD-BI-N)
81	S-020700-WD-CM-M	11/29/2021	BUREAU OF GENERAL SERVICES	MINOR REVISION	OBW TONNAGE LIMIT CALCULATION CHANGE IN THE LANDFILL EXPANSION Expires 12/31/25
82	S-020700-WD-CP-C	4/15/2022	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	CELL 14 CONSTRUCTION CONDITION #5 (LICENSE #S-020700-WD-BI-N)
83	S-020700-WD-BI-N	9/26/2022	BUREAU OF GENERAL SERVICES	SCHEDULE OF COMPLIANCE	SCHDULE FOR LANDFILL FINAL COVER CONSTRUCTION
84	S-020700-WD-CO-M	11/28/2022	BUREAU OF GENERAL SERVICES	MINOR REVISION	CONSTRUCTION OF RENEWABLE NATURAL GAS FACILITY AT JRL
85	S-020700-WD-CR-C	4/27/2023	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	CELL 15 CONSTRUCTION CONDITION #5 (LICENSE #S-020700-WD-BI-N)
86	S-020700-WD-CQ-C	6/12/2023	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	STAGE 1 FINAL COVER DESIGN REPORT CONDITION #19 (LICENSE #S-020700-WD-BI-N)
87	S-020700-WD-CT-C	6/18/2024	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	STAGE 2 FINAL COVER DESIGN REPORT CONDITION #19 (LICENSE #S-020700-WD-BI-N)
88	S-020700-WD-CU-C	6/26/2024	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	CELL 16 CONSTRUCTION CONDITION #5 (LICENSE #S-020700-WD-BI-N)
89	S-020700-W5-CV-N	10/2/2024	BUREAU OF GENERAL SERVICES	PUBLIC BENEFIT DETERMINATION	PUBLIC BENEFIT DETERMINATION - LANDFILL EXPANSION
90	S-020700-WD-CW-C	6/26/2025	BUREAU OF GENERAL SERVICES	CONDITION COMPLIANCE	STAGE 3 FINAL COVER DESIGN REPORT CONDITION #19(LICENSE #S-020700-WD-BI-N)
91	S-020700-W5-CV-N	3/23/2026	BUREAU OF GENERAL SERVICES	REVISED PUBLIC BENEFIT DETERMINATION	PUBLIC BENEFIT DETERMINATION - LANDFILL EXPANSION

JUNIPER RIDGE LANDFILL

MEDEP SOLID WASTE LICENSES (SPECIAL WASTE)

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	ONE-TIME OR ON-GOING	DESCRIPTION
9	S-020700-WU-L-N	1/22/2002	GEORGA-PACIFIC CORPORATION	NEW LICENSE	ON-GOING	CITY OF OLD TOWN BURN PILE / HOT LOAD ASH
12	S-020700-WD-O-M	3/12/2004	STATE PLANNING OFFICE	MINOR REVISION	ON-GOING	ADDITIONAL ASH SOURCES
16	S-020700-WT-V-N	9/14/2006	STATE PLANNING OFFICE	NEW LICENSE	ONE-TIME	SOUTH PARIS TANNERY SLUDGE & SOIL
17	S-020700-WT-Y-N	2/20/2007	STATE PLANNING OFFICE	NEW LICENSE	ONE-TIME	BRUNSWICK NAVAL AIR STATION NON-HAZARDOUS DEBRIS & SOILS
18	S-020700-WT-Z-M	3/14/2006	STATE PLANNING OFFICE	MINOR REVISION	ONE-TIME	SOUTH PARIS TANNERY SLUDGE & SOIL REVISION
20	S-020700-WT-AA-N	9/10/2007	NEWSME LANDFILL OPERATIONS, LLC.	NEW LICENSE, PLUS CORRECTED COPY	ONE-TIME	CUTLER NAVAL AIR STATION PETROLEUM CONTAMINATED SOILS
21	S-020700-WT-AC-M	2/5/2008	NEWSME LANDFILL OPERATIONS, LLC.	MINOR REVISION, PLUS CORRECTED COPY	ONE-TIME	BRUNSWICK NAVAL AIR STATION NON-HAZARDOUS DEBRIS & SOILS
26	S-020700-WT-AI-N	9/17/2009	STATE PLANNING OFFICE	NEW LICENSE	ONE-TIME	BANGOR NON-HAZAARDOUS SOIL & DEBRIS (DREDGED SPOILS)
27	S-020700-WT-AL-N	11/4/2009	STATE PLANNING OFFICE	NEW LICENSE	ONE-TIME	BREWER LEAD IMPACTED SOIL
28	S-020700-WU-AN-N	3/1/2010	STATE PLANNING OFFICE	NEW LICENSE	ON-GOING	PINE TREE WASTE OILY DEBRIS
29	S-020700-WT-AQ-N	4/15/2010	STATE PLANNING OFFICE	NEW LICENSE	ONE-TIME	BRUNSWICK NAVAL AIR STATION LEAD PAINT SOIL
30	S-020700-WU-AP-N	5/21/2010	STATE PLANNING OFFICE	NEW LICENSE	ON-GOING	NEW ENGLAND WASTE SERVICES SULFUR WASTES
31	S-020700-WU-AJ-N	6/30/2010	STATE PLANNING OFFICE	NEW LICENSE	ON-GOING	TREATED BIOMEDICAL WASTE

32	S-020700-WT-AR-N	7/21/2010	STATE PLANNING OFFICE	NEW LICENSE	ONE-TIME	HOWLAND TANNERY SLUDGE
37	S-020700-WT-AX-N	10/28/2011	STATE PLANNING OFFICE	NEW LICENSE	ONE-TIME	CUTLER NAVAL AIR STATION CONTAMINATED SOILS
38	S-020700-WT-AW-N	11/7/2011	STATE PLANNING OFFICE	NEW LICENSE	ONE-TIME	BASF CONTAMINATED SOILS
51	S-020700-WT-AD-N	9/8/2016	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	BELFAST MGP CONTAMINATED SOILS
52	S-020700-WT-AE-N	10/7/2016	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	LOUIS MACK SITE LEAD CONTAMINATED SOILS
55	S-020700-WT-BK-N	7/27/2017	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	SANFORD CIRCUIT BOARD PROCESSING WASTE
57	S-020700-WT-BN-N	7/6/2018	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	PIONEER PLASTIC CONTAMINATED SOILS
58	S-020700-WT-BO-N	9/11/2018	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	WATERVILLE ARMORY TREATED BUILDING DEBRIS
59	S-020700-WT-BR-N	9/21/2018	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	HANCOCK ELLSWORTH TANNERY TRENCH SOLIDS, HIDES, MISC DEBRIS
61	S-020700-WT-BS-N	10/23/2018	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	UNUM BUILDING - PORTLAND PCB CONTAMINATED SOIL
62	S-020700-WT-BT-N	1/28/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	US NAVY - CUTLER LEAD PAINT CHIPS/GRAVEL/MISC.
63	S-020700-WT-BU-N	4/1/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	EMERA MAINE - BANGOR PCB IMPACTED CONCRETE
65	S-020700-WT-BV-N	6/3/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	HUHTAMAKI POLYETHYLENE & CELLULOSE TRIMMINGS
66	S-020700-WT-CA-N	11/27/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	SOUTHWEST HARBOR TREATED LEAD CONTAMINATED SOIL
67	S-020700-WS-BY-N	12/12/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	DUPONT NUTRITION - ROCKLAND FIRE BRICK
68	S-020700-WT-BX-N	12/18/2019	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	GENERAL ELECTRIC -BANGOR SPENT FILTER SAND
70	S-020700-WT-CC-N	2/10/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	GAC CHEMICAL CORP. - SEARSPORT GRAVEL, SOIL, RR BALL. STONE W/SIKA

71	S-020700-WT-CE-N	3/16/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	ROWE SCHOOL. - YARMOUTH SOIL IMPACTED W/ PULP SLUDGE & ASH
74	S-020700-WT-CF-N	5/6/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	ST. JOHN'S CHURCH - SOUTH PORTLAND PCB/LEAD PAINT BUILDING DEBRIS
75	S-020700-WT-CH-N	7/10/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	SOUTHWEST HARBOR LEAD STABILIZED SOIL
76	S-020700-WT-CJ-N	10/2/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	MT. ARARAT HIGH SCHOOL - TOPSHAM PCB CONTAMINATED PLYWOOD
77	S-020700-WT-CI-N	10/2/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	FIBER MATERIALS - BIDDEFORD GRAPHITE & CARBON DUST
78	S-020700-WT-CK-N	12/3/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	ONE-TIME	CMP UTIL. POLE STORAGE AREA - BRIDGTON CONTAMINATED SOIL
79	S-020700-WU-CD-N	12/16/2020	BUREAU OF GENERAL SERVICES	NEW LICENSE	ON-GOING	VARIOUS SPECIAL WASTES & REVISIONS TO ON-GOING SPECIAL WASTE LICENSES

JUNIPER RIDGE LANDFILL

PINE TREE LANDFILL CARRIED BLANKET WASTE LICENSES

TAB #	PERMIT NUMBER	ISSUE DATE	ENTITY	TYPE	DESCRIPTION
BW-1	S-010396-WU-DI-N	3/10/1993	SERF	NEW LICENSE	PIONITE DUST
BW-2	#S-01987-WD-BK-M	12/14/1994	SERF	MINOR REVISION	PETROLEUM CONTAMINATED SOIL & DEBRIS
BW-3	#S-01987-WD-BM-M	5/6/1994	SERF	MINOR REVISION	LEATHER TANNING SCRAPS
BW-4	#S-01987-WD-BN-M	7/15/1994	SERF	MINOR REVISION	LEATHER TANNING FILTER PRESS CAKE AND COLLAGEN SCRAPINGS
BW-5	#S-01987-WD-BO-M	1/4/1995	SERF	MINOR REVISION	ASH & SLUDGE WASTES
BW-6	#S-01987-WD-BP-M	6/16/1995	SERF	MINOR REVISION	COMMERCIAL & INDUSTRIAL LAUNDRY SLUDGE
BW-7	#S-01987-WD-BQ-M	3/29/1996	SERF	MINOR REVISION	SERF CDD PROCESSING RESIDUALS
BW-8	#S-01987-WD-BT-M	12/4/1996	SERF	MINOR REVISION	HIGH VANADIUM ASH
BW-9	#S-01987-WD-BU-M	5/12/1997	SERF	MINOR REVISION	PIGEON WASTES
BW-10	#S-01987-WD-BV-M	6/26/1997	SERF	MINOR REVISION	AMBIENT AIR & WATER FILTRATION MEDIA
BW-11	#S-01987-WD-EB-M	1/7/2004	SERF	MINOR REVISION	ASH & SLUDGE WASTES REVISION TO WD-BO-M
BW-12	#S-01987-WD-GY-M	12/12/1997	SERF	MINOR REVISION	NON-HAZARDOUS CHEMICAL PRODUCTS
BW-13	#S-01987-WD-HA-M	4/29/1998	SERF	MINOR REVISION	OVERSIZED BULKY WASTES

BW-14	#S-01987-WD-IA-M	9/23/1998	SERF	MINOR REVISION	FRONT END PROCESS RESIDUE & OVERSIZED BULKY WASTE
BW-15	#S-01987-WD-KB-M	5/3/2005	PINE TREE LANDFILL	MINOR REVISION	SPRAY BOOTH PAINT FILTERS AND DRIED PAINT RESIDUE
BW-16	#S-01987-WD-WA-M	12/19/2003	PINE TREE LANDFILL	MINOR REVISION	URBAN FILL SOIL & DEBRIS
BW-17	#S-01987-WD-YA-M	2/20/2003	NEW ENGLAND WASTE SERVICES OF ME, INC.	MINOR REVISION	VIRGIN PETROLEUM CONTAMINATED SOIL & DEBRIS
BW-18	#S-01987-WD-ZA-M	8/29/2003	NEW ENGLAND WASTE SERVICES OF ME, INC.	MINOR REVISION	RR TIE ASH, WTP SLUDGE, DREDGED SPOILS

Original James River Paper License #S-020700-7A-A-N (1993)

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

BOARD ORDER

IN THE MATTER OF

JAMES RIVER PAPER COMPANY, INC. Old Town, Penobscot County, Maine WEST OLD TOWN SECURE LANDFILL FACILITY #S-20700-7A-A-N (APPROVAL WITH CONDITIONS)	) SITE LOCATION OF DEVELOPMENT, SOLID WASTE, AND NATURAL RESOURCE PROTECTION ORDER, AND WATER QUALITY CERTIFICATION FINDINGS OF FACT AND ORDER

Pursuant to the provisions of 38 M.R.S.A., Section 1301 et seq. (the "Waste Management Act"), 38 M.R.S.A., Section 481 et seq. (the "Site Law"), 38 M.R.S.A., Section 480-A et seq. (the "Natural Resource Protection Act"), and 33 U.S.C., Section 1341 (Section 401 of the Federal Water Pollution Control Act), and the regulations adopted pursuant to these laws, the Board of Environmental Protection ("Board") has considered the application of JAMES RIVER PAPER COMPANY, INC. ("James River") with its supportive data, staff summary, agency review comments, public hearing transcripts, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. APPLICATION SUMMARY

A. Application: James River has applied to construct and operate a 68-acre secure landfill, and the necessary ancillary structures, for the disposal of the pulp and papermaking residuals generated at James River's mill in Old Town, Maine (the "mill").

B. History: James River presently disposes of its pulp and papermaking residuals at its landfill in Milford, Maine. The Milford landfill was licensed by the Board on June 14, 1978 (Department License #07-4285-19430); it is a 26-acre attenuation landfill. Historical information from the original application and more recent hydrogeological investigations of the area adjacent to the Milford landfill indicate the property does not meet the siting requirements of the Maine Solid Waste Management Regulations ("Rules") for the construction of a secure landfill expansion; therefore, James River is precluded from obtaining a license from the Department to horizontally expand the Milford landfill. James River operates the Milford landfill under an Agreement and Schedule of Compliance ("SOC") between James River, the Board and the State of Maine Attorney General, dated March 26, 1992. The SOC requires, in part, that disposal of wastes at the Milford landfill cease before April 1, 1995, when the elevation of

the landfill reaches 258 feet or, if this application for a new secure landfill is approved, within 30 days of the date it is operational, whichever event first occurs.

On August 8, 1990, James River submitted a Preliminary Information Report, prepared in accordance with the Rules, Chapter 401.1(E)(2), for a new secure landfill to be constructed and operated in west Old Town, Maine. Department of Environmental Protection ("Department") staff reviewed the report and on September 19, 1990 issued to James River a Determination of Environmental Feasibility ("Determination") for the proposed project. In the Determination the Department concurred with James River that the site warranted further investigation for site suitability and facility design.

On August 6, 1991, James River submitted a completed application (DEP #S-20700-7A-A-N) for the west Old Town landfill project initially described in the Preliminary Information Report. On October 10, 1991, the application was found to be complete for processing. The application has been reviewed by staff of the Department's Bureau of Hazardous Materials and Solid Waste Control and Bureau of Land Quality Control. Departmental and Agency review comments were received from the Bureau of Water Quality Control, the Maine Department of Transportation, the Maine Department of Inland Fisheries and Wildlife and the Maine Historic Preservation Commission. The application consists of the original submittal by James River, all subsequent comments received on the application, supplemental information filed by James River and its consultants, and the public hearing record.

C. Summary of Proposal: James River proposes to construct and operate a 68-acre secure landfill, and the necessary ancillary structures, on a 740-acre parcel of land it owns in west Old Town, located between Routes 16 and 43. The proposed project will entail filling approximately 8.84 acres of freshwater wetland, of which 1.31 acres are State jurisdictional wetlands as defined under the Maine Wetland Protection Rules. During the preparation of the application, James River strived to balance utilization of the most geologically favorable areas of the site for solid waste disposal with minimization of impacts to wetlands and other protected natural resources.

The proposed facility will consist of a secure landfill, an operations and maintenance facility, a leachate storage pond, a leachate pump station, access roads, and sedimentation/detention ponds. The proposed design for the landfill maximizes the disposal capacity of the site and fully utilizes the low hydraulic conductivity glacial till soils and upward-moving ground water to maintain the environmental integrity of the site. The proposed landfill is designed to provide a total in-place capacity of approximately 3 million cubic yards for the disposal of pulp and papermaking residuals (pulp and papermill wastewater sludge, grit and lime waste, wood waste, and small quantities of miscellaneous solid wastes from the mill) over a 15 to 20 year life. The final height of the landfill will be approximately 60 feet above the existing grade.

James River requests variances from 9 provisions of the Rules: the language of the escrow trust account; construction in a protected natural resource; the design of the landfill liner system; the final cover design for the landfill; the design of the leachate storage pond liner system; and operational requirements concerning daily cover, intermediate cover, final cover and the use of a tire wash facility.

2. PUBLIC PARTICIPATION

A. Intervenors: Pursuant to 5 M.R.S.A., Section 9054 and Chapter 20 of the Department's Administrative Regulations, the following parties requested intervenor status in James River's application proceedings:

1. City of Old Town ("City"): On September 4, 1991, the City requested municipal intervenor status pursuant to 38 M.R.S.A., Section 1310-S. The City utilized a $50,000 intervenor assistance grant, dated November 25, 1991 and administered by the Department pursuant to 38 M.R.S.A., Section 1310-S, to contract for an independent review of the application and to participate in the public hearing process. The City formed a Committee to oversee its review of the application; the Committee consisted of the City Manager, 2 residents of west Old Town, 2 members of the City Council, and 2 representatives of James River.

JAMES RIVER PAPER COMPANY, INC. Old Town, Penobscot County, Maine WEST OLD TOWN SECURE LANDFILL FACILITY #S-20700-7A-A-N (APPROVAL WITH CONDITIONS)	))))))	SITE LOCATION OF DEVELOPMENT, SOLID WASTE, AND NATURAL RESOURCE PROTECTION ORDER, AND WATER QUALITY CERTIFICATION FINDINGS OF FACT AND ORDER

The Committee recommended the City hire Robert G. Gerber, Inc. ("RGGI") to review the application. RGGI conducted a peer review of the project and, where necessary, subcontracted with additional consultants having other areas of expertise. Reports on the review process were submitted to the City on May 26, 1992, October 29, 1992, and December 15, 1992. RGGI submitted a final summary report to the City on January 26, 1993. RGGI concluded that James River had chosen an appropriate site for this landfill, and that it was in general agreement with the intent of Sevee and Maher, Inc.'s ("SME"), James River's primary consultant, design for the landfill. The summary also referred to a list of 8 items it suggested be included in the permitting and construction process. The City Council voted on March 1, 1993 to adopt a Resolution supporting James River's west Old Town landfill application subject to 9 stipulations listed in the Resolution. A copy of the Resolution was included in the City's pre-filed public hearing testimony.

The primary issues of concern to the City, as identified in the Resolution, are as follows: verification of visual and noise impacts after operation of the landfill commences; the installation of piezometers in Cell 1 of the landfill to measure the leachate head; the monitoring of surface water quality; the provision of a Letter of Credit to ensure proper closure of the landfill facility; the performance of annual inspections of the landfill's stability by an independent geotechnical consultant; the placement of "weak wastes" as defined in the application at least 15 feet from the landfill's side slopes; that James River's proposed screw press at the Old Town mill be operational prior to commencement of operation of the west Old Town landfill; and that only wastes generated at James River's Old Town mill be disposed of in the landfill.

The City was formally granted its status as the automatic municipal intervenor by the Board at its January 27, 1993 meeting.

2. Peter P. Dufour: On December 28, 1992, Mr. Dufour requested intervenor status. Mr. Dufour lives on a large parcel of land near the proposed project and he served on the City's Committee, described above, as one

of the residents of the west Old Town area. The primary issues of concern to him are as follows: the potential visual impact of the facility; the facility's impact on the area's wetlands; the noise and odors generated by the facility; and the justifications supplied by James River for the proposed size and location of the facility. Mr. Dufour was granted intervenor status by the Board at its January 27, 1993 meeting. As described during the pre-hearing conference, held March 11, 1993, Mr. Dufour's position during the proceeding was "neither for nor against" the project.

3. Citizens Against Residential Dumping ("CARD"): On January 25, 1993, CARD filed a Motion to Intervene. The Motion identifies CARD as a local citizens group comprised predominantly of abutters and neighbors of the proposed facility who would be allegedly directly impacted by construction of the facility. The issues of concern to CARD are as follows: the impacts from increased traffic, noise, odors and lighting; the potential for degradation of the area's ground and surface water quality; loss of the ability to hunt, trap and fish on the property; the lack of a quantitative assessment of the metals which would be present in the landfill when it reaches capacity and the potential for each of the metals to bioaccumulate; the appropriateness of the methodologies used to assess wildlife present on the property; the presence of unidentified springs and intermittent streams, and their location in relation to the proposed solid waste boundary; James River's record of environmental compliance; the lack of a single area map of the facility; inadequate setbacks from classified bodies of water, protected natural resources, and property boundaries; whether the facility overlies and/or abuts a sand and gravel deposit; the potential for sludge to fall from truck tires and wash into the wetlands crossed by the access road; the lack of upgradient monitoring wells; and the potential threat that the landfill will leak. CARD was granted intervenor status as an opponent to the project by the Board at its January 27, 1993 meeting.

B. Public Hearing: As required by 38 M.R.S.A., Section 1310-S(2), after public notice, a public hearing on the application was held at Eastern Maine Technical College in Bangor, Maine on April 6 and 7, 1993. The hearing was held

pursuant to 5 M.R.S.A., Section 9054 and Chapter 20 of the Department's Administrative Regulations.

A pre-hearing conference was held on March 11, 1993 in Augusta, Maine to establish guidelines for the hearing; the Conference was recorded and a transcript is part of the record.

The applicant and all intervenors testifying during the April 6 and 7 day sessions of the public hearing submitted pre-filed testimony on or before March 22, 1993.

The April 6, 1993 evening session was reserved for testimony from the general public. Several persons spoke either in support of or opposition to the project. Written testimony was also presented to the Board Chair during this session and is part of the record.

The public hearing was recorded and transcribed in 3 separate volumes. The volumes will be identified as follows: "T1" will refer to the April 6 day session. "T2" will refer to the April 6 evening session. "T3" will refer to the April 7 session. At the close of the hearing, the Board Chair kept the record open for the following submittals: a written review by Dr. Alan Lewis, CARD's expert witness, of James River's Forest Management Plan, due April 23, 1993; written rebuttal and/or redirect testimony by all parties (James River, the City, Mr. Dufour and CARD), due May 14, 1993; written responses by James River to staff's March 9, 1993 engineering review comments, due May 14, 1993; and written Post-Hearing Briefs by all parties, due May 25, 1993. All of these documents are part of the record.

C. Written Comments on the Application: Comments from opponents and supporters of the project were received throughout the processing of the application. Issues of concern raised in letters from opponents of the project, most of whom were CARD members, were those listed above as CARD's primary concerns. Issues of concern raised in letters from proponents of the project, most of whom have a business relationship with James River, were primarily related to the economic benefits of James River's presence in the area, and James River's professional integrity. All of these letters are part of the record.

JAMES RIVER PAPER COMPANY, INC. Old Town, Penobscot County, Maine WEST OLD TOWN SECURE LANDFILL FACILITY #S-20700-7A-A-N (APPROVAL WITH CONDITIONS)	))))))	SITE LOCATION OF DEVELOPMENT, SOLID WASTE, AND NATURAL RESOURCE PROTECTION ORDER, AND WATER QUALITY CERTIFICATION FINDINGS OF FACT AND ORDER

3. FINANCIAL CAPACITY

James River Paper Company, Inc. is a wholly owned subsidiary of James River Corporation. James River's application included the 1990 corporate annual report and the Form 10-K Transition Report for the period ending December 30, 1990. According to Form 10-K, James River Corporation estimated its 1991 capital spending on environmental facilities, including solid waste disposal facilties, would total $110 million. James River supplied a summary of the anticipated total costs associated with closure and post-closure care of the facility. In response to comments from staff during review of the application, the projected costs associated with closure and post-closure care have been increased. The total estimated cost of the development is now approximately $29,184,000.

As the owner of a generator-owned landfill, James River has used the financial test in lieu of liability insurance coverage contained in 40 CFR 264.147(f) of July, 1986 to comply with the provisions of Chapter 400.4(I) of the Rules.

The Board finds that James River has demonstrated that it has the financial capacity to undertake the proposed project consistent with the State's environmental standards and laws.

4. TECHNICAL ABILITY

James River has an environmental staff of 4 full-time professionals; they are responsible for maintaining compliance with all of the environmental permits associated with the mill operations. James River has owned and operated its licensed solid waste disposal facility in Milford, Maine since 1983. The Milford facility is currently being operated in substantial compliance with the Rules and its SOC.

James River retained SME to prepare the application and design the facility; SME has extensive experience preparing solid waste facility applications, designing secure landfills, and serving as geotechnical and engineering consultants to companies with landfills licensed by the Department.

James River also retained other consultants to assist in the preparation of the application and implementation of the project. James River retained Woodlot Alternatives, Inc. ("WAI") to asist with wetland and other natural resource protection issues. WAI's president, John Lortie, is a

certified biologist and botanist with extensive experience with wetland delineation and functional assessments, as well as wetland compensation and mitigation plans.

James River also retained Eric Wood of Acentech, Inc. to assist with noise issues and Dennis Jud of Environmental Analysis and Design and W. Kirk Doggett to assist with visual issues.

The Board finds that James River has demonstrated that the combination of the James River personnel and the consultants hired for the project have the technical ability to develop the project in a manner consistent with State standards and laws.

5. TITLE, RIGHT OR INTEREST

The Board finds that James River has provided evidence of its title to the property by submitting a copy of its warranty deed to the 740-acre parcel of land on which the landfill facility will be located. The deed includes a 50-foot wide, 5,700 feet long, right-of-way across land owned by the University of Maine; the right-of-way provides access to the parcel from Route 16.

6. TRAFFIC MOVEMENT

James River included in its application a traffic report for the proposed facility. Access to the facility will be via Route 16, a 2-way State road; it has 2 12-foot bituminous concrete travel lanes, each with a 6-foot wide gravel shoulder. The entry to the facility is approximately 600 feet west of Interstate 95. The report states that, on average, the peak traffic rate is anticipated to be 6 vehicles per hour. During the spring, periods of high runoff due to snowmelt and/or rainfall, and during emergency situations at the mill's wastewater treatment plant, the peak traffic rate is anticipated to be 12 vehicles per hour because of increased hauling of waste and/or leachate.

The primary access road into the facility will be upgraded to a 24-foot wide (2 12-foot wide travel lanes) gravel road, approximately 10,950 feet long including the right-of-way. Because of the proximity to neighboring properties near Route 16, the first 500 foot section of the road will be paved. Construction of the road will occur within the first 2 months

of the project's construction. A secondary access road will circle the landfill. Its maximum length will be approximately 6,700 feet. This road will be 12 feet wide and have a gravel surface.

Access to the facility will be restricted by means of 2 gates: one gate exists now and is located near the intersection of the primary access road and Route 16; the second gate will be contiguous with the landfill's perimeter security fence and will be located near the landfill's operations facility. A 1000 square foot parking area will be constructed near the operations facility for use by operators and visitors. Short-term parking for sludge and leachate haul vehicles is provided by a gravel parking area adjacent to the loading rack station. Long-term parking of sludge or leachate haul vehicles will not occur on-site.

The roadways, entrances and parking facilities for the proposed facility have been designed in accordance with the applicable zoning standards for Old Town, Maine. All will remain the property of and be maintained by James River.

The maximum gross vehicle weight limit allowed by State regulations over the specified travel route is 80,000 pounds. There is no seasonal weight restriction on the travel route. Based on current material transport practices, the gross vehicular weight for sludge trucks is approximately 78,000 pounds and approximately 71,000 pounds for leachate trucks. Similar vehicle sizes are intended to be utilized at the west Old Town facility.

The Maine Department of Transportation ("MDOT") reviewed the traffic study; MDOT staff concluded that there will be no adverse traffic impacts, either on or off the site, from operation of the proposed development.

The Board finds that James River has demonstrated that roads and intersections in the vicinity of the proposed development will have the ability to safely and conveniently handle the traffic attributable to the proposed development at the time it becomes fully operational, that traffic patterns in the development area are safe and designed to provide adequate parking, smooth traffic flow, adequate turning and maneuvering space, adequate room for the discharge and loading of materials and passengers, and adequate space for snow storage and removal operations, and that the weight limits specified

in the application for vehicles transporting wastes to or from the facility are acceptable for the roads proposed to be utilized by the vehicles.

7. AIR QUALITY

There will be no sources of air emissions from the project other than occasional fugitive dust from the unpaved access roads. James River has committed to apply water and/or calcium chloride to the road surfaces outside the landfill during the dry summer months on an as-needed basis. No open burning will be allowed at the west Old Town facility. The Board finds that James River has demonstrated that there will be no adverse effect on air quality from the development provided fugitive dust is controlled.

8. CLIMATE

The Board finds that there will be no water vapor emissions associated with the project because there are no sources of water vapor emissions associated with the facility.

9. NATURAL DRAINAGE WAYS

Surface water in the vicinity of the proposed landfill drains in a southwesterly direction to a wetland which forms the headwaters of an unnamed tributary to Pushaw Stream, approximately 3.5 miles away. The land slopes at the site range from 4 to 10 percent. The proposed project is not located within a lake watershed. Surface water drainage from the landfill site presently consists primarily of overland flow with some channeling occurring on topograghically lower areas along man-made woods roads.

When the landfill is developed, clean surface water drainage from around the landfill and off the final cover will drain to a stormwater detention pond and through existing drainage paths to the wetland west of the site. The development of the facility as proposed will not cause any alteration of the natural drainageways of the wetland area, the unnamed tributary, or abutting properties located downgradient of the site.

As described more fully in Finding of Fact 10, intermittent and/or perennial streams associated with Wetland #9 will be crossed by the existing primary access road. The road was

initially constructed prior to 1955. James River proposes to widen the road from its present 20-foot width to a 24-feet wide gravel road. This widening, and all stream crossings must be carried out in accordance with the applicable permit-by-rule criteria of the Natural Resources Protection Regulations, Chapter 305.

The Board finds that existing contours and drainage ways will generally remain unchanged with the development of the proposed project, provided James River complies with the Chapter 305 criteria for stream crossings. No effect on abutting properties due to changes in natural drainage ways are anticipated.

10. WETLANDS

A. Description: The proposed project will entail the filling of approximately 1.31 acres of wetlands under State jurisdiction. James River has requested a variance from Chapter 401.1(D)(9) of the Rules, which requires, in part, that a facility not be located in, on, or over a protected natural resource.

CARD alleges that James River has not provided "affirmative" and "clear and convincing" evidence that the placement of the landfill on and within 75 feet of a protected natural resource is in keeping with the spirit and intent of the State's environmental laws in that James River could reduce the size of the faciltiy and/or move it further up the hill.

Three State jurisdictional wetlands will be impacted. The wetlands are designated as wetlands #6, #7, and #9 on plans contained in the application (see Figure 2-1 and Figure 2-2 of Volume VI). The breakdown of the wetland impact and the type of wetland as classified under the Wetland Protection Rules, Chapter 310 ("Wetland Rules") is as follows:

Wetland #6	0.57 acres	Class III
Wetland #7	0.01 acres	Class II
	0.02 acres	Class III
Wetland #9	0.34 acres	Class II
	0.37 acres	Class III

Wetland #6 is a mixed hardwood, softwood forested wetland approximately 155 acres in size. The wetland vegetation is dominated by broad-leaved deciduous and needle-leaved evergreen trees. Soils are seasonally saturated. Under the Wetland Rules, the forested wetland to be altered is classified as Class III.

Wetland #7 is a mixed wetland consisting of both emergent marsh and forested wetland comprising 110 acres. The forested wetland vegetation is dominated by broad-leaved deciduous and needle-leaved evergreen trees. The soil is seasonally saturated. The emergent wetland is dominated by narrow-leaved vegetation and is permanently saturated. Under the Wetland Rules, the forested wetland contains Class I, II and III wetlands; only Class II (0.01 acres) and Class III (0.02 acres) wetlands will be altered.

Wetland #9 is a large forested wetland complex of unknown acreage bisected by the existing access road built prior to 1955. It is a mixture of softwood forested wetland or scrub/shrub, both dominated by broad-leaved deciduous and needle-leaved evergreen trees, and is seasonally saturated. Wetland #9 has numerous small finger-like wetlands, some of which are stream associated. Under the Wetland Rules, the forested and scrub/shrub wetlands to be altered are classified as Class II (0.34 acres) and Class III (0.37 acres). The Class II wetlands are narrow floodplain wetlands adjacent to perennial streams, dominated by speckled alder. The Class III wetland is generally dominated by red maple, black spruce, balsam fir and white pine.

B. Alternatives Analysis: James River explored a number of alternatives to the proposed project, including not developing a new landfill and utilizing an alternative site, modifying the proposed boundary at west Old Town, reducing the size of the proposed facility, and developing the landfill around the existing wetlands. James River concluded the only practicable option was to develop a new landfill. It conducted a thorough alternatives analysis and chose the site which posed the least impact to wetlands. James River's site selection process identified a total of 58 sites within a 20 mile radius of the mill. After an initial evaluation of the 58 locations, the list was narrowed to 10 sites. The 10 sites were evaluated in greater detail for their conformance with all state and

federal laws and regulations pertaining to solid waste disposal, site location, and protected natural resources. The west Old Town location was chosen as best conforming with the wide range of criteria. The Board finds that the proposed project complies with the avoidance standard under Chapter 310, Standard E.1.a and b of the Wetland Rules for Class II and Class III wetlands, respectively.

C. Minimal Alteration: Modification of the landfill boundary is limited by the presence of shallow bedrock, more permeable soils, and less favorable ground water flow regimes in other areas of the property. The proposed project was designed to reduce wetland impacts to the minimum amount necessary while maintaining siting considerations and design constraints.

D. Compensation: A detailed functional analysis of the wetlands has been prepared by WAI. Wetlands #6 and #7 have the potential to be highly effective at ground water discharge, floodflow alteration, wildlife diversity/abundance for breeding and migration and aquatic diversity/abundance. They have the potential to be moderately effective at sediment stabilization, sediment/toxicant retention, and nutrient removal transformation. Wetland #9, adjacent to the existing road, has the potential to be very effective in nutrient removal, retention, and transformation. Some loss of these functions is expected as a result of the proposed project. However, impact to the wetland system in this area as a whole is not expected to be significant due to the location of the proposed facility and the undeveloped nature of the surrounding area.

James River has prepared a compensation package consisting of restoration of 1.76 acres, restoration/enhancement of 0.92 acres, and preservation of 27.92 acres of wetland. Ten sites on 3 old roads, on the site, are proposed for restoration or restoration/enhancement. The areas to be restored or enhanced are located northwest and south of the proposed landfill. The 2 preservation areas are also located northwest and south of the proposed landfill. The location of each site, the compensation proposed, and acreage involved is shown on Figure 1, entitled "Wetland Mitigation Location", of the Compensation Plan.

JAMES RIVER PAPER	14 SITE LOCATION OF
COMPANY, INC.	) DEVELOPMENT, SOLID WASTE,
Old Town,	) AND NATURAL RESOURCE
Penobscot County, Maine	) PROTECTION ORDER, AND
WEST OLD TOWN SECURE	) WATER QUALITY
LANDFILL FACILITY	) CERTIFICATION
#S-20700-7A-A-N	)
(APPROVAL WITH CONDITIONS)	FINDINGS OF FACT AND ORDER

James River proposes to restore or restore/enhance a previously filled on-site wetland which has a 20 to 30 foot wide roadway. Restoration will consist of removing previously placed fill, excavating to the proper depth, and placing wetland soil in the excavated areas. Restoration/enhancement will consist of removing fill, when present, and discontinuing the use of the road areas. Restoration and restoration/enhancement sites include forested, scrub/shrub and emergent wetland areas. The areas to be enhanced and/or restored are either forested wetland classified as Class III or forested wetland associated with streams or emergent wetland which are classified as Class II.

The old road bed material will be removed 8 to 10 inches below the surface of the adjacent wetland and imported hydric soil from the landfill area will be spread to the natural grade of the area. Construction will be phased such that the hydric soil to be used in the restoration has little or no storage time between excavation and placement in the restoration area. The area will be covered with straw and wetland plant material and seeds contained in the soil will be allowed to grow. Natural seeding should also occur from the adjacent wetland species.

The wetland to be restored is identical in nature to the wetlands being filled by the proposed project. It is anticipated that, after completion of the restoration, sediment stabilization will be improved, but that floodflow alteration capabilities will be slightly decreased. Production export will not appreciably change. Ground water recharge and discharge capabilities will be similar to the adjacent wetland.

Also included in the compensation package is a schedule for the restoration and enhancement work, erosion control measures, and a monitoring plan. Weather permitting, James River proposes to initiate construction of the restoration areas within two months after receipt of all permits necessary to construct the project. The restoration/enhancement areas will be evaluated annually for 3 years after the restoration. A report will be submitted to the Department annually; it will include a narrative and photos of the work completed, work to be done, successes, failures, and any necessary remediation.

The areas to be preserved are emergent marsh, classified as Class II under the Wetland Rules. The southern wetland to be preserved is a portion of Wetland #6 and Wetland #7, which were designated separately for purposes of analysis. Descriptions of these wetlands may be found above. The northwestern wetland is the headwater tributary of Judkins Brook. Both preservation areas are freshwater emergent marshes, consisting of floodplain wetlands adjacent to perennial streams.

James River submitted a "Declaration of Covenants and Restrictions" ("Declaration") to be attached to the deed for the west Old Town property and filed at the Penobscot County Registry of Deeds once all necessary permits are received. The Declaration specifically defines restrictions on land use in the restored/enhanced and preserved wetlands.

E. Findings: The application and testimony by witnesses for James River during the public hearing indicate that James River balanced its disposal capacity needs, the siting requirements of the Rules, and avoidance or minimization of wetland impact throughout preparation of the application. James River is unable to move the landfill footprint to the east without causing the landfill to straddle a ground water divide, thus potentially creating a landfill that is impossible to monitor.

Although CARD argues that the environment will not be best protected by granting James River a variance to Chapter 401.1(D)(9) of the Rules, the environment is best protected by siting landfills in tight soils, which are frequently found near or in wetland areas. James River has demonstrated that the process it used to select the west Old Town site, and to select the landfill footprint area within the site, conforms to the Department's regulations for siting a landfill and complies with the standards for obtaining a wetlands alteration permit.

The Board finds that James River has performed an adequate alternatives analysis and that there is no practicable alternative which would be less damaging to the environment. The proposed restoration, restoration and enhancement, and preservation plan will adequately compensate for lost or altered wetland functions associated with the proposed landfill and James River has minimized

the extent of wetland impact to the maximum extent practicable. The project conforms to Chapter 310 of the Wetland Rules, provided James River amends and files the Declaration, submitted as part of the compensation package, within 60 days after all permits have been acquired and that the annual report regarding the restoration/enhancement is submitted to both the Department's Bureaus of Hazardous Materials and Solid Waste Control and Bureau of Land Quality Control. The Board finds that James River has presented clear and convincing evidence that construction in a protected natural resource, in accordance with a permit granted pursuant to the Natural Resources Protection Act and the Wetland Rules, in order to meet other landfill siting requirements complies with the intent of State law and Rules.

11. STORMWATER RUNOFF

The proposed landfill site is located on a 740-acre wooded parcel of land. Hardwoods predominate in the upper elevations, and softwoods predominate in the lower elevations. The parcel is irregularly shaped and the landfill will be positioned in the southern portion of the parcel. The landfill will occupy about 68 acres; the entire amount of land to be cleared for construction of the landfill, the ancillary structures and the access roads is approximately 97 acres. A drumlin oriented in a northwest to southeast direction effectively divides the parcel into 4 major watersheds: northeast, northwest, southeast and southwest. The northwest and northeast watersheds both contribute to Judkins Brook and eventually Birch Stream. The southwest and southeast watersheds both contribute to unnamed tributaries that empty into Pushaw Stream. Both Birch Stream and Pushaw Stream empty into the Stillwater River which flows to the Penobscot River.

The proposed landfill is located in the southwest watershed. The elevation of the sub-watershed defined by the limits of the development ranges from approximately 216 to 145 feet Mean Sea Level. The proposed landfill site slopes toward the west at grades varying from 4 to 10 percent. Surface drainage consists of shallow concentrated flow with some channelization occurring in the lower elevations as a result of old logging roads. The surficial soils at the proposed site are primarily Plaisted and Howland series along with some Moranda, Buxton and Scantic. Where necessary, the runoff from the developed site will discharge into detention or sedimentation basins

that eventually contribute to the unnamed tributary feeding Pushaw Stream.

The purpose of the stormwater control plan is to manage the runoff from the developed site in a manner that will not adversely impact the peak rate of runoff to nearby properties or waters of the State. To evaluate the impact of the stormwater flows on the proposed project, the volume and peak runoff rates were estimated for a 25-year/24-hour storm event. The stormwater flows were estimated using the U.S. Soil Conservation Service TR-55 methodology using a Type II storm. To compare stormwater impacts, stormwater flows for existing site conditions and post-development conditions of the watershed containing the landfill boundaries were estimated.

The comparison of the peak flow for the pre- and post-development conditions of the site indicated increases in the post-development peak flows for the 2- and 10-year storm events. To correct for these increases, 2 structures were designed to control and slowly release through outlet structures the peak runoff. Two sedimentation ponds will be constructed: one will be located at the western end of the landfill, adjacent to the leachate storage pond. This 25,000 square foot pond has been sized and designed to function as a sedimentation pond during the development of the facility and, after modification, as a detention pond after the development is completed. The other sedimentation pond will be an impoundment area near the southwest end of the perimeter ditch running along the eastern face of the landfill. The watersheds outside the limits of the landfill development were not analyzed since no significant amount of development will take place in any other area and therefore the existing drainage conditions will remain relatively unchanged. As designed, the development of the proposed facility will not increase the peak runoff rate from the site associated with the 2-, 10-, or 25-year storm events.

During stormwater events, clean surface water outside the active landfill area will be diverted by ditches and channels to off-site locations. Stormwater flows within active areas of the landfill will be conveyed by the perimeter ditches to inlet structures located along the interior of the perimeter dike. These inlet structures will be connected to the leachate transport pipes, which will then convey the leachate flow to the facility's pump station and/or leachate storage pond. Some stormwater will be temporarily stored in the

perimeter ditches until it can be transported to the leachate pond. James River will be responsible for the maintenance of all stormwater control devices at the proposed landfill site.

The Board finds James River has proposed an adequate stormwater management plan, and that the proposed development will not have an unreasonable effect on runoff-infiltration relationships.

12. EROSION AND SEDIMENTATION CONTROL

As described in Finding of Fact 11, the project is proposed to be constructed in the southern portion of a 740-acre wooded parcel of land. The grading and layout of the proposed facility was undertaken with the major consideration being to minimize any impact on wetland areas. Existing drainage courses will be utilized where feasible to convey stormwater from the developed site. No surface drainage outlet structure from the developed site will discharge directly onto abutting properties. On-site observations within the proposed landfill site have not identified areas that would be prone or highly susceptible to erosion, nor have on-site investigations and a review of the Soil Conservation Service soils mapping of the proposed site identified any highly erodible soils. The wetland area located downgradient of the proposed landfill site can be classified as in good condition and stable, with a heavy growth of marsh grasses and no apparent signs of erosion problems.

To minimize erosion during landfill construction and operation, temporary and permanent erosion control measures will be implemented by James River. According to the proposal, both the temporary and permanent measures will be continuously monitored and all necessary maintenance will be performed by the contractor and/or the landfill operator, as part of the scope of work to assure that devices are functioning properly.

During construction of the landfill, the greatest potential for erosion will occur during the site grubbing and grading phases. Prior to any construction, siltation fencing will be placed around the proposed maintenance and operations area, the limits of Cell 1 of the landfill and the leachate pond area, as shown in Volume IV, Appendix F, Figure 2-1. In addition to the fencing, stone check dams and hay bale dikes will be placed as shown in Figures 2-1 and 2-2. Mulching and

seeding of exposed soils will be carried out as specified in the Erosion Control Plan. As additional cells are constructed, additional temporary sedimentation ponds will be constructed in areas within the landfill limits adjacent to the cell that is being constructed; the details of these ponds will be submitted to the Department for review and approval as part of the individual design submittal for each cell.

Once construction is completed, permanent erosion control measures will be implemented; the erosion control system will be maintained throughout operation of the facility. During landfill operations, stormwater falling within the open area of the landfill will be collected internally and treated as leachate. Upon reaching the final design grade, the landfill will be closed out in accordance with a closing plan reviewed and approved by the Department.

James River states that all soil erosion and sediment control measures will be performed in strict accordance with the approved Erosion and Sedimentation Control Plan. At the Department's request, James River has certified that the plan was prepared in general accordance with the "Maine Erosion and Sediment Control Handbook Construction Best Management Practices Handbook".

James River's construction schedule shows construction of the sedimentation pond in June, 1994 but staff comment that the sedimentation pond should be constructed prior to any grubbing on-site except that associated with the necessary dewatering measures. In addition, the proposed project includes numerous stream crossings along the primary access road, and construction of the facility will include the disturbance of soil within 100 feet of regulated wetlands. Staff recommend that the following measures be added to the Erosion and Sedimentation Control Plan:

1. All stream crossing must be done in accordance with the provisions of Chapter 305, Section 10, Construction Standards #1-3 and 5-17 of the Natural Resources Protection Act Permit-by Rule Standards.
2. All soil disturbance within 100 feet of a protected natural resource must be done in accordance with Chapter 305, Section 2, Construction Standards #5 through 15.

The Board finds that the erosion control plan establishes adequate provisions for controlling erosion and sedimentation during construction, operation and closure of the facility, provided the construction of the sedimentation pond is completed before any on-site grubbing occurs, except that associated with dewatering measures, and the comments provided by staff are incorporated into the Erosion and Sedimentation Control Plan.

13. SURFACE WATER QUALITY

The proposed facility has the potential to cause the pollution of surface waters through both point- and non-point sources. The application addresses each of the potential sources.

The Board has found in findings above and below that leachate will be adequately managed by James River's proposal and it will not discharge to surface water. (See Finding of Fact 29(C).) Disposal of wastewater from the operations and maintenance facility will be through an approved on-site subsurface disposal system. (See Finding of Fact 15.) Pollutants which will affect the state classification of the surface water bodies will not be discharged. (See Findings of Fact 11, 12 and 37.)

The proposed facility will not unreasonably interfere with the natural flow of any surface or subsurface water.

The proposed facility does not cross any outstanding river segment as identified in 38 M.R.S.A., Section 480-P, nor does it involve any dredging or the disposal of dredge spoils.

The Board finds that the facility will not have a significant impact on surface water quality of the waters of the State.

14. GROUND WATER QUALITY/QUANTITY

The site of the proposed facility has undergone an extensive geologic and hydrogeologic investigation, consisting of test pits, soil borings, and the installation of monitoring wells and piezometers. The investigation suggests that the horizontal component of ground water flow on-site is in a southwesterly direction to a wetland which forms the headwaters of an unnamed tributary to Pushaw Stream. The hydrogeologic performance of the landfill facility will initially be monitored at 12 monitoring wells. (See Finding

of Fact 37.) James River has demonstrated that the proposed landfill is not located on a sand and gravel deposit, nor is it located over a fractured bedrock aquifer as defined by 38 M.R.S.A. Section 1310-N(2-A). The nearest mapped sand and gravel aquifer is approximately 1.3 miles from the proposed site. The nearest mapped bedrock high-yield zone is located approximately 5.8 miles from the proposed site.

James River has provided a comprehensive list of the wastes proposed for disposal in the landfill. (See Finding of Fact 31.) It has proposed adequate methods for preventing ground water pollution as the result of waste disposal. (See Findings of Fact 28, 29 and 37.) It has provided a proposed plan of action, and alternatives, to be followed in the event the proposed facility results in ground water contamination. (See Findings of Fact 29 and 37.) The application contains data establishing background water quality. A ground and surface water monitoring program is proposed. (See Finding of Fact 37.).

The Board finds that the facility will not have an unreasonable adverse effect on ground water quality or quantity.

15. WASTEWATER DISPOSAL

Wastewater from the operations and maintenance facility is expected to be minimal due to the small number of employees on-site (normally only 1 to 2 people). An on-site subsurface sewage disposal system has been designed for the facility by a licensed site evaluator.

The leachate generated at the facility will be collected by the facility's leachate collection system and temporarily stored at the leachate holding pond. From there, leachate will be pumped via an on-site pump station into tanker trucks for transport to the James River Wastewater Treatment Plant in Old Town, Maine. Staff of the Bureau of Water Quality Control reviewed and recommended approval of the leachate disposal provisions.

The Board finds that James River has made adequate provisions for the disposal of wastewater generated by the project.

JAMES RIVER PAPER COMPANY, INC. Old Town, Penobscot County, Maine WEST OLD TOWN SECURE LANDFILL FACILITY #S-20700-7A-A-N (APPROVAL WITH CONDITIONS)	22 SITE LOCATION OF DEVELOPMENT, SOLID WASTE, AND NATURAL RESOURCE PROTECTION ORDER, AND WATER QUALITY CERTIFICATION FINDINGS OF FACT AND ORDER

16. NOISE

The proposed project is located on a wooded 740-acre parcel of property; the landfill will be constructed on the southwestern part of the property. The nearest residences are located along Route 43, approximately 1500 feet to the southwest; the nearest property line is located approximately 340 feet from the solid waste boundary. The area along Route 43 is primarily rural residential in nature.

James River retained Acentech Inc. to perform a noise study for the project. The study was conducted in accordance with the provisions of the Site Location Regulations, Chapter 375. Hourly measurements were taken between 7:00 a.m. and 5:00 p.m. on April 2, 1991. At Location 1, southwest of the proposed facility, hourly equivalent L_{eq} sound levels ranged from 45 to 51 dBA. At Location 2, along the access road near 2 residences, the hourly equivalent Leq sound levels ranged from 55 to 58 dBA.

Mr. Dufour argues that James River could further reduce the facility's impact on the residents of west Old Town by limiting the days of operation of the facility (eg: no weekend deliveries). He also notes that noise will be more audible when the landfill is being operated in the upper cells, and recommends that James River be required to perform an additional noise study at completion of Cell 3.

Stipulation #1 of the City's Resolution was that a noise study be performed in the first month of operation of the landfill.

Based on the levels obtained by Acentech for Location 1, it is reasonable to expect the daytime pre-development ambient hourly sound level at the nearest protected location will be 45 dBA or less and/or the nighttime pre-development ambient hourly sound level at the nearest protected location will be 35 dBA or less. Therefore, James River would not be allowed to exceed a routine operational noise level of 55 dBA between 7:00 a.m. and 7:00 p.m., and a noise level of 45 dBA between 7:00 p.m. and 7:00 a.m., except near the residences north of the site where the daytime limit is 60 dBA and the nighttime limit is 50 dBA. Staff suggests, in response to recommendations made by Mr. Dufour and the City, that it is reasonable to require that James River perform a supplemental noise study during the operation of Cell 4, which is to be built on top of Cells 1 through 3.

Noise associated with the delivery and pickup of materials is exempt from the noise regulations in that none of these vehicles will be parked at the development for longer than 60 minutes. Noise associated with safety and protective devices installed in accordance with code requirements is also exempt from regulation by the Department.
Operational equipment to be used at the landfill will include waste, leachate, and gravel haul vehicles, and a bulldozer used to spread and compact the delivered waste and gravel. Diesel engine powered equipment of the type used at the landfill would be expected to produce maximum noise levels in the range of 78 to 84 dBA at a distance 50 feet from the equipment when operated with engine exhaust mufflers in proper working condition. Actual measured noise levels at 50 feet from the equipment currently in use at James River's Milford landfill are in the range of 73 to 80 dBA. Acentech expects the hourly L_{eq} noise levels associated with the routine equipment operation at the landfill to be less than 30 to 35 dBA at the nearest residence. Hourly L_{eq} noise levels from routine equipment operation are expected not to exceed 52 dBA at the nearest property line. The only other expected source of operational noise will be the pumps associated with the leachate collection and storage system.

During construction, noise will be produced primarily by diesel engine powered equipment working at the site and making deliveries to the site. James River states it will ensure, to the maximum practical extent, that construction noise is maintained within reasonable levels; it expects that hourly equivalent noise levels in protected locations will be significantly less than the regulatory hourly sound level limit of 87 dBA for construction activities of 12 hours duration.

Atmospheric adsorption and the proposed buffer strips which will surround the facility will help to reduce off-site sound levels. In addition, James River plans to implement several noise abatement measures during the construction and operation of the landfill. Effective exhaust mufflers in proper working condition will be installed and maintained on all engine powered equipment used to construct and operate the facility. Noise producing activities during routine operation at the landfill will generally be limited to daylight hours between 7:00 a.m. and 5:00 p.m., 7 days a week. Truck drivers will be instructed to drive slowly and responsibly near the 2 homes

along the site access road. The landfill leachate pumps will be enclosed.

The Board finds that the construction and operation of the project will not cause excessive noise that could degrade the health and welfare of nearby neighbors, provided that actual noise data gathered during operation of the landfill demonstrates the estimates provided in the application are accurate.

17. PRESERVATION OF HISTORIC SITES

James River consulted the Maine Historic Preservation Commission to determine if there were any properties in the project area of historic, architectural or archaeological significance, as defined by the National Historic Preservation Act of 1966. The Commission has indicated in a letter dated May 2, 1990 that there are no such sites in the project vicinity. Review comments received by the Department on the application from the Commission did not alter that opinion. The Board finds that the proposed facility will not have an adverse effect on the preservation of historic sites.

18. UNUSUAL NATURAL AREAS

James River and its consultants conducted extensive investigations within and in the vicinity of the proposed project to identify the potential presence of any land or water areas which contain natural features of unusual geological, botanical, zoological, ecological, hydrological or other significance. James River and its natural resource consultant, WAI, consulted the Critical Areas Program database, the Maine Natural Heritage Program database, Maine Geological Survey maps, National Wetlands Inventory maps, Maine Department of Inland Fisheries & Wildlife ("DIF&W") staff and Department staff for potential unusual natural areas. According to the available databases, only 2 unusual natural vegetative areas were known to occur on or near the site. WAI found that the preferred habitat for Viola nova-angliae does not exist on the property and no Carex oronensis was observed in studies of the areas of its preferred habitat on-site. While the various wetlands on the site potentially provide habitat for a number of reptiles and amphibians, no unusual species were found during comprehensive studies of the area, including vernal pool studies conducted by WAI. The proposed project will fill 1.31 acres of State jurisdictional

wetlands, but the wetlands are not unusual in nature. The Board finds that the proposed development will not have an adverse effect on the preservation of natural areas.

19. ACCESS TO DIRECT SUNLIGHT

The maximum final elevation of the proposed landfill is approximately 60 feet above base grade. The landfill was designed to minimize its visual impact on the surrounding area. (See Finding of Fact 20 for more details on the visual impact.) The location and design of the landfill, including property setbacks and buffer strips, will effectively eliminate the possibility of the facility blocking access to direct sunlight or casting a shadow onto neighboring properties. The Board finds that the proposed facility will not block neighboring properties' access to direct sunlight.

20. SCENIC CHARACTER

The proposed facility has been designed in an attempt to minimize the disposal area's potential for negative visual impacts on surrounding areas. A visual impact assessment report for the proposed facility was prepared by Environmental Analysis and Design.

As part of the assessment, a preliminary report on the potential visual impacts of the project was prepared; this report led to a design change in the landfill resulting in a reduction of 20 feet in the proposed final height of the landfill.

The report assesses the visual impact of the proposed landfill by examining in sequence the following: the project's viewshed, including principal vantage points; the visibility and visual magnitude (or dominance) of the project to potential viewers; the visual congruity or contrast of the project in relation to the existing landscape character of the viewshed; an evaluation of the proposed mitigation; and an assessment of the project's scenic impact, in light of its information gathered from the previous tasks.

The report concludes that the proposed landfill will not have an unreasonable effect on the scenic character of the areas north of Corley Road from which it will be visible for the following reasons:

- The project's viewshed will be limited to 3 residences and a 2000 foot section of Route 43. Given the planned sequencing of fill during more than a decade and the probable growth of the intervening forest in that time, from the current average height of 55 feet to about 65 to 75 feet, the project may turn out to be continuously invisible to all off-site residents and passersby.

- The visual magnitude of the project will be small from all potential vantage points. That is because the potential viewing distances range from 2,800 feet to 4,500 feet, placing the project in the middle ground of background for all viewers. The alteration to the landscape may be seen below the skyline among or below the treetops from any viewing position. As a portion of the horizontal cone of vision of observers along Route 43, the landfill at capacity will cover a maximum arc of approximately 24 degrees, which represents less than one-eighth of any stationary viewer's width of normal vision and less than one-fourth of a motorist's view cone.

- The visual contrast of the project will be low for most factors, including height, scale, form, orientation, and shape, within the existing lines of the landscape. The landfill will present some visual contrast with the foreground forest in texture and color as the fill is completed. That contrast will come from the planting of a suitable grass mix. Where visible, it will appear to be a cultivated field, typical of hillside farms.

Mr. Dufour argues that all testimony and visual exhibits during the public hearing centered around the completion of the landfill based on the assumption that existing trees and new plantings managed by an accelerated tree growth program will maintain an adequate screen. He argues the tree screen in question would need to reach maximum height in 5 years to adequately screen the first 5 cells and that can not be done. He recommends that the Board require that a second visual analysis be conducted at the completion of Cell 3 to determine at that time what visual impact Cells 4 and 5 would have if built on top of the first 3 cells.

Stipulation #2 of the City's Resolution was that a visibility analysis be repeated during the fourth year of operation.

The Board finds that the design of the project takes into account the scenic character of the surrounding area and the development has been located and screened to minimize its visual impact. The Board finds that the development will not have an unreasonable effect on the scenic character of the surrounding area, provided that the results of a future visual analysis agree with projections provided in the application.

21. WILDLIFE AND FISHERIES

James River retained WAI to conduct an extensive study of the potential impact of the proposed facility on wildlife and fisheries and their habitats. Diamond Occidental Forestry, Inc., which is partly owned by James River Corporation, also participated in the study. The investigation included a review of existing natural resource inventories and data bases, a review of Deer Wintering Area Maps and Wetland Inventory Maps provided by DIF&W, as well as a field survey of the site for potential significant wildlife habitats. Habitats investigated included: habitats of endangered and threatened species; high and moderate value deer wintering areas and travel corridors; high and moderate value water fowl and wading bird nesting and feeding habitat; Atlantic sea-run salmon habitat; and shorebird and seabird habitat. It was determined the nearest mapped eagle nest is 13.5 miles from the proposed landfill. There are no mapped deer yards on the parcel of land, nor were any identified during field investigations of the site.

During the field surveys, WAI identified one potentially significant wildlife habitat, a significant waterfowl nesting and feeding area, located in the large freshwater emergent marsh located along the western portion of the project area; however, the project will not impact this wetland and there will be an undisturbed area between the habitat and the proposed landfill.

DIF&W reviewed the application, and provided review comments. Although the agency found the emergent wetland area located within 300 feet of the project area to be of low value for waterfowl or wading bird habitat at this time, it commented that higher water levels would occur if beavers return to the area, thus potentially increasing the value of the wetland area to moderate or high. It therefore recommends that a 250 foot buffer zone be required or an effective riparian travel corridor be maintained if a lesser buffer is necessary. James

River proposes to develop a healthy stand of conifers in the buffer zone between the facility and the emergent wetland; the buffer will be a minimum of 100 feet wide.

The Board finds that James River has made adequate provisions for the protection of wildlife and fisheries provided that buffer strips are maintained as proposed along Wetlands #6 and #7.

22. BUFFERS

The facility has been located to minimize adverse effects on the existing natural environment. Natural buffer strips not disturbed by development of the landfill will be maintained between the facility's waste boundaries and public roads and all property boundaries.

During the public hearing, CARD spent considerable time cross-examining James River's witnesses as to the distance between the waste facility boundary and the property boundary. During cross-examination, James River was questioned about the distance from the waste facility boundary and the property boundary. An expert witness for James River measured the distance from the corner of the leachate pond to the property boundary and found the distance to be 300 feet. Chapter 401.1(D)(3)(b) of the Rules requires a 300 foot buffer between the waste facility boundary and the property boundary. CARD arques that the "waste facility boundary" encompasses the sedimentation pond and the secondary access road as well as the areas used to handle waste (the landfill and the leachate collection and storage system), thus placing the waste facility closer than 300 feet from the nearest property boundary.

The waste facility boundary is defined by the Rules, Chapter 400.1(O)(3) as:

> ". . the outermost limit of the waste facility, whether used for disposal or not. It includes the solid waste boundary plus all associated structures, storage areas, equipment or land area used for handling waste."

The sedimentation pond, the drainage ditches, the outlets for both these control devices, and the secondary access road will not be used to handle waste. These areas, and all other developed parts of the property, are part of the "facility site", defined by the Rules, Chapter 400.1(GG) as:

"any developed land area of a waste facility used for purposes affected by these rules, including roads, drainage ways, structures, parking lots, and handling sites, or any areas thereof approved by the Board for such development."

The Rules do not specify a setback distance for the facility site.

The Board finds that the proposed facility meets or exceeds all setback distances required by the Rules.

23. FLOODING

The proposed waste facility will not be located within a 100-year floodplain. The Federal Emergency Management Agency floodplain maps were consulted to determine where 100-year floodplains occur on the property. The proposed landfill footprint is approximately 200 feet away from a 100-year floodplain. At one location, the primary access road crosses a 100-year floodplain boundary (see Volume II, Exhibit 34). However, the work to be done in that area is minimal and will be carried out in accordance with a permit obtained pursuant to the Natural Resources Protection Act and an approved Erosion and Sedimentation Control Plan. The Board finds that the proposed project will not unreasonably cause or increase the flooding of the alteration area or adjacent properties, nor create an unreasonable flood hazard to any structure, provided James River implements the approved erosion and sedimentation control plan.

24. EXISTING USES/CONDITIONS

The 740-acre parcel of property is currently wooded and contains several wetlands areas. The area contains a high degree of structural diversity; it provides habitat for many species of mammals, birds, reptiles, amphibians and plants. The investigations of the property indicate it is used for recreation (hunting, perhaps fishing, traveling by snowmobiles and all-terrain vehicles, and perhaps hiking, cross-country skiing and snowshoeing) year-round. Testimony by CARD during the public hearing indicated the property is used by area residents for the above uses, plus trapping.

James River states all of the above uses of the property will be allowed in the future on undeveloped areas of the property;

its Natural Resource Management Plan, dated May 1991, suggests that existing uses be maintained and enhanced.

James River's Natural Resource Management Plan provides for the active management of the undeveloped portions of the property. In summary, the goals of the plan are to: promote and maintain an uneven-aged stand of trees using single tree selection and spacing methods; provide habitat for migratory songbirds; maintain habitat for wildlife associated with mature forests in designated management units; and enhance recreational and educational use of the property.

The Board finds that James River has assessed the existing uses and conditions and demonstrated the proposed project will not unreasonably interfere with existing uses and conditions and may enhance values in some areas of the property.

25. SAND SUPPLY

The project site is not located on or near any sand dune.

26. SOIL TYPES SUITABLE FOR DEVELOPMENT

The surficial geologic mapping published by the Maine Geological Survey ("MGS") indicates the site soils consist of glacial till deposits and glacial marine deposits of the Presumpscot Formation on the perimeter of the site in the lower elevations. The MGS surficial geologic map also suggests that the site consists of a glacial stream-lined feature. Plaisted and Howland soils are the predominant soil types mapped within the proposed landfill footprint. These 2 soil types are associated with glacial till. Other soils mapped within the footprint include Moranda (also associated with glacial till), and Buxton, and Scantic soils (associated with the marine clays of the Presumpscot Formation). The site investigation of the west Old Town landfill site indicates that the geologic setting is in agreement with available published information. The surficial geology generally consists of a very dense, very silty glacial till overlying bedrock. Within the footprint of the landfill, the fines content of the glacial till ranges from 34 to 66 percent passing the No. 200 sieve. The average fines content of deeper glacial till within the landfill footprint was 58 percent. The dense nature of the glacial till combined with its high fines content results in a relatively impervious soil base for the landfill. As discussed in Finding of Fact 28,

the soils which will underlie the landfill are basal tills and are suitable for the development of the proposed landfill.

The Board finds that the facility will be located on soils suitable for the nature of the development.

27. SURFACE WATER PROTECTION

James River provided a thorough hydrogeological assessment of the proposed site and the contiguous area. The assessment included studies on the degree of dilution or attenuation of any contaminants that may be released from the proposed site and flow toward any classified surface water.

CARD argued during the proceeding that James River's application was not complete because it did not include a single area map containing all the information specified by Chapter 401.1(G)(1)(c) of the Rules, thus making it difficult to evaluate the locations of protected natural resources. CARD requests that the Board require James River to submit a single area map of the facility site, prepared in accordance with Chapter 401.1(G)(1)(c) of the Rules, and that the parties then be allowed to submit written comments on the information contained in the map. The Board finds that the area map submitted by James River complies with Chapter 401.1(G)(1)(c) of the Rules. As provided in that section, James River supplied an area map based on a sufficiently accurate USGS map of the site.

Several residents of west Old Town testified for CARD during the proceeding that James River has not identified all intermittent streams and springs on the parcel of land. For example, George Feero, one local resident, testified that a spring is located near or under the west side of the proposed landfill, and that there are intermittent streams on the north and east side of the site. Mr. Dufour argues that any leachate or contaminated runoff emitted into the abutting wetland and stream to the west of the site will eventually contaminate soil and water in his north pasture, used to graze cattle.

The Board finds that, based on staff's investigations of the area within 300 feet of the landfill footprint and studies of topographic and aerial photographs, the solid waste boundary of the landfill will not lie closer than 300 feet from a classified body of surface water. Also the failure analysis

and engineered assessment for the facility indicate the landfill facility will not contaminate ground water or surface water outside the solid waste boundary in excess of the standards specified in Chapter 400.1.of the Rules, based on hypothetical failure simulations that confirm that the natural setting and design will not adversely affect any surface water, based on travel times and dilution ratios. The Board finds that the proposed facility will not pollute any water of the State.

28. GROUND WATER PROTECTION

On behalf of James River, SME performed a site investigation and hydrogeologic evaluation of the area. The hydrogeologic information was focused around interpreting the geology; identifying potential aquifers near the site; identifying soil type and depth, bedrock type and depth, ground water depth, ground water seepage rates and flow directions; documenting existing water quality; and analyzing the potential impacts of a failure of any and/or all of the landfill's barriers to protect ground water. The evaluation includes SME's review of the available geologic literature for the site area and the results of field and laboratory investigations, including; SME's interpretations of the site geology and hydrogeology; and a failure analysis of the engineered leachate containment systems.

SME's report reaches the following conclusions:

A. Soils which underlie the proposed landfill consist of basal tills and are suitable for the nature of the proposed development.
B. The average horizontal hydraulic conductivity of the basal tills below the landfill is 0.0071 feet/day (2.5×10^{-6} cm/sec) and the tills have a fines content of 34 to 66 percent which, therefore, are suitable soils according to the Rules.
C. The lower portions of the site away from the landfill, both east and west, have upward seepage gradients. Approximately 50 percent of the proposed landfill footprint currently has upward ground water seepage moving from the underlying soils and bedrock toward the base of the liner.
D. The site does not overlay, or lie adjacent to, a mapped significant sand and gravel aquifer, nor a mapped high-yield bedrock zone. The proposed facility will not cause an unreasonable threat to a significant sand and

gravel aquifer, or to a fractured bedrock aquifer, based on the information collected in the report and the proposed site design.

E. There are no downgradient public or private potable water supply wells between the proposed facility and adjacent unnamed streams. The closest water supply well is located approximately 1500 feet west of the site across a bog and stream, and on the other side of a topographic ridge.

F. The natural topographic and hydrogeologic setting isolates the landfill from the potable supply wells along Route 43 and Route 16.

G. The bedrock consists of metasediments that are generally competent and occasionally fractured. There was no mapped or observed faulting in the bedrock beneath the site.

H. There were no Holocene Period faults observed within the basal tills.

I. Ground water beneath most of the site naturally moves from east to west toward the unnamed stream. Opposing seepage gradients on the other side of the unnamed stream hydraulically isolate the landfill from the areas further to the west. Beneath a small portion of the upper part of the landfill, ground water moves to the north and northeast toward an unnamed stream. Here again, the topographic features located east of the site restrict the groundwater from moving significantly beyond the stream.

J. There will be a minimum of 10 feet of basal till remaining beneath the proposed landfill and the surface of the bedrock after excavation and grading. The average thickness is approximately 30 feet.

K. Simulations of hypothetical failures of the leachate containment system demonstrate the effectiveness of the natural setting in preventing adverse impacts on the regional ground water and existing water supplies. More importantly, the design and natural setting will preclude an adverse impact on a fractured bedrock or a significant sand and gravel aquifer.

During cross-examination by CARD, an expert witness for James River was questioned about the deposits of washed till described below as the subject of further investigation. He testified that the deposit is not a sand and gravel deposit as defined by the Rules, Chapter 400.1(ZZZ). (See tesimony T1 at 197 through 201.) CARD alleges that the deposit is stratified

sand and gravel as defined by the Rules and that staff chose not to classify this deposit as sand and gravel, but noted during the review that a like deposit might be interpreted as sand and gravel in future projects.

A concern was raised in the initial hydrogeologic review (see December 20, 1991 memo from Peter Nickeson to Cyndi Darling) that parts of the stratigraphic section within 300 feet of the margin of the proposed landfill consist of permeable, stratified sand and gravel, which the application identifies as washed till, encountered in relatively few borings. Staff commented that if the deposits are small and discontinuous, they need not be of concern. Staff requested that James River perform supplemental investigations in the areas in question to provide direct evidence on the deposits.

On April 7, 1992, James River submitted the results of the additional investigations requested by staff. The additional explorations confirmed that, while the sandy deposits initially encountered are present beyond the limits of the initial investigation, SME is correct in interpreting these deposits as isolated pockets of reworked, or washed, till, and therefore not an esker, outwash plain, glaciomarine delta, kame, or stratified moraine. Based on staff's review of the supplemental information, the Board finds that it is reasonable to interpret this washed till deposit as not being a "stratified deposit commonly consisting of sand and/or gravel" because SME's extensive additional investigations showed that the washed till did not extend to the bedrock trough to the west, and that the deposit is not of significant size and is not in communication with a sand and gravel aquifer. Because of the deposit's limited volume and the fact that it is only recharged through the overlying till, a sustainable well yield would be unlikely. The Board finds that this washed till deposit is not a ground water resource requiring protection and is not more threatened than is the bedrock underlaying the entire landfill footprint.

CARD also argues that the facility will leak, and that James River has not met the requirements of Chapter 401.2(B)(3)(f) of the Rules in that it has not provided specific proposals to implement remediation or any substantive cost estimates to clean up the leaks or the environmental damage they cause. The Board finds that Chapter 401.4(E)(6) of the Rules requires that costs associated with failures of the engineered systems are only required when items are specifically identified by

the Department and that staff did not request costs during review of the project. Chapter 401.2(B)(3)(f) of the Rules applies to either a total failure of the landfill or to a failure of an engineered system. The only feasible mechanism for remediation of a complete landfill failure is closure of the landfill. James River has submitted an estimate of costs associated with closure of the landfill and a closure plan for the facility. (See Findings of Fact 3 and 29.)

Based on the above findings, the Board finds that the proposed facility does not overlie a significant sand and gravel aquifer, does not pose an unreasonable threat to an aquifer it does not overlie, does not overlie or lie within 300 feet of a sand and gravel deposit, and does not pose a threat to an underlying bedrock aquifer.

29. ENGINEERING DESIGN OF FACILITY

A. General Description of Design: The proposed design involves the excavation of an average of 10 feet of glacial till to provide additional volume for waste disposal and to minimize the height of the landfill. A minimum separation of 10 feet will be maintained between the base grade of the liner system and the bedrock surface. Acceptable excavated till material will be used as construction materials for containment dikes, composite liner system, access roads, and final and intermediate cover soil.

The landfill will be constructed in cells sized to contain approximately 1 year's waste to minimize the open area of the landfill at any time and thus minimize leachate generation. The site design includes a leachate collection system and a temporary leachate storage pond. Dewatering for the construction of the facility's sedimentation pond, leachate pond and Cell 1 of the landfill will effectively be accomplished by the construction of an upgradient interceptor trench approximately 1400 feet long. The proposed landfill will be developed in 3 major phases; each phase will contain 3 base cells and 2 upper cells, placed on top of the base cells. Each cell, designed to provide capacity for 1 year, will be approximately 7.5 to 8 acres in size, with the capacity to hold approximately 200,000 cubic yards (150,000 yards of waste and 50,000 yards of gravel). Plans for the development of the each cell will be submitted to the Department for review and approval a

minimum of 6 months prior to the planned time of construction.

James River expects the ground water levels beneath the site to decline as the landfill cuts off precipitation recharge on the western flank of the drumlin, and proposes to augment the recharge into ground water by constructing a ditch along the crest of the drumlin hill in the vicinity of the eastern edge of the landfill. The ditch will be constructed to impound runoff water, thereby allowing recharge into the till and the underlying bedrock. This will allow upward seepage gradients to continue to occur beneath the western portion of the landfill. In addition, the ditch will establish a ground water divide to the east of the landfill in both the soil and bedrock, which will also force ground water to the west beneath the entire landfill so ground water will move in one direction.

The leachate collection and transport piping for the landfill has been designed to handle a 25-year, 24-hour storm event occurring during the last year of landfill development. A lined leachate storage pond will be used to store leachate collected from the leachate collection system. A pump system will transport leachate from the storage pond approxmately 2,025 feet to a leachate haul truck loading rack located near the site's approximately 1500 square foot operations and maintenance structure, located near the entrance of the primary access road. Landfill closure will be an ongoing process of the landfill operation.

B. Liner system design: James River proposes to install an alternative liner design at the landfill and requests a variance from Chapter 401.4(C)(2)(c) of the Rules. The proposed liner system will be a composite liner consisting of the following sequence of materials (from top to bottom): a 15-inch sand leachate collection system layer; an 80-mil flexible membrane ("FML") liner constructed of textured high-density polyethylene ("HDPE") with smooth edges; 12 inches of recompacted glacial till with a maximum hydraulic conductivity of 3×10^{-6} cm/sec; a bentonite geocomposite liner comprised of a layer of bentonite sandwiched between 2 geotextiles which are needlepunched into a single sheet; a second 12-inch thick layer of recompacted glacial till with a maximum hydraulic conductivity of 3×10^{-6} cm/sec; a 4-ounce non-woven

geotextile; 12 inches of drainage sand; and a 4-ounce non-woven geotextile.

James River states in its variance request that the use of a bentonite layer will eliminate the need for an additional 1-foot layer of till because of the bentonite's permeability ($1x10^{-9}$ cm/sec). It also states that the proposed site is distinctive in that the natural topographic and hydrogeologic setting isolates the landfill hydraulically as a result of the deep glacial tills the upward ground water gradients. James River has demonstrated that the till/GCL portion of the liner will provide a hydraulic conductivity and performance equal to or superior to that required by the Rules.

The quality assurance/quality control ("QA/QC") program for installation of the liner system is discussed in Finding of Fact 30.

The FML will be supplied by a National Sanitation Foundation ("NSF") certified manufacturer and will meet NSF Standard No. 54 specifications, as well as accepted performance specifications of the industry. The recompacted till liner will have a minimum in-place density of 95 percent maximum (as measured by the Modified Proctor test), have a minimum fines content of 35 percent, and have a maximum particle size less than or equal to 3 inches. The bentonite geocomposite liner will consist of a 6-ounce per square yard non-woven geotextile overlaid by a 1-pound per square foot layer of bentonite and a 3.25 ounce per square yard slit film woven geotextile. The average permeability of the bentonite layer will be $1x10^{-9}$ cm/sec.

A 1-foot thick sand layer with 4-inch diameter perforated piping will be installed below the composite liner system to relieve upgradient ground water pressures. The design thickness of this underdrain layer was determined from ground water gradients measured at the site during preparation of the application; the actual extent of the underdrain system along the lower elevations of the site will be field determined by the on-site engineer during the construction of each base cell.

The base preparation of the existing site soils below the underdrain system will have a minimum in-place density of 85 percent as measured by the Modified Proctor test and

have a moisture content within 4 percent above optimum during compaction. Where needed, soil will be added to the landfill site for grading purposes, or to obtain the minimum 10-foot separation between the base preparation grade and bedrock. Moisture and in-place densities will be controlled during backfilling operations to obtain the requirements described for the base grade material. The maximum compaction lift thickness will be 9 inches.

The Board finds that James River has presented clear and convincing evidence that the alternative liner system, which includes the use of a bentonite geocomposite in place of 1 foot of till soil, complies with the intent of State law and Rules, and will provide equal or superior performance to the design standards of the Rules.

C. Leachate Management: Leachate is water which contains dissolved and suspended substances resulting from the passage through or over a waste material. Sources of water which contribute to the generation of leachate at the landfill include precipitation and water which drains from the waste due to consolidation. During operation of the landfill, leachate will be generated through precipitation runoff which contacts waste; precipitation which infiltrates waste; and water which drains from the waste. After closure of the landfill (described in paragraph E, below) leachate generation will be minimized by maximizing evapotranspiration and encouraging surface runoff.

The volumes of leachate which will be generated by the proposed landfill were estimated using the the Hydrologic Evaluation of Landfill Performance ("HELP") computer model. The model uses climatologic, soil characteristic and design input data to compute runoff, evapotranspiration, infiltration, and lateral drainage for a landfill.

The leachate collection system, placed above the landfill liner, will be comprised of 6-inch diameter perforated, HDPE piping which will be fusion-welded and spaced at 50-foot on center within the landfill cells. These lateral pipes will connect to header pipes composed of 12- or 18-inch diameter HDPE. The header pipes will be connected to 24-inch diameter HDPE trunk lines, which will empty into the leachate pond. Leachate will be pumped from the leachate pond via a 2,000 lineal foot double-walled force main to a loading rack, located adjacent to the landfill

operations building. Leachate haul vehicles will back up under the loading rack and be filled for transport back to the James River wastewater treatment plant. The pump station and loading rack will be automated facilities with alarms and fill instrumentation to ensure against potential spills or overflows.

Leachate generated at the proposed facility will be treated and disposed of at the mill's wastewater treatment plant. A copy of the leachate service and transport contract for the facility is contained in Volume IV, Appendix L of the application.

Leachate is proposed to be removed from the landfill cells by gravity flow through pipe penetrations ("boots") in the landfill liner system. In response to staff concerns, James River has modified the boot design to be a double boot; James River will also perform 100 percent non-destructive testing of the pipe boot penetrations by air testing both the skirt and the sleeve of the pipe boot.

The leachate storage pond will be used to store leachate collected from the leachate collection piping network. The leachate pond is designed to hold approximately 1.4 million gallons, plus 2 feet of freeboard, for a total capacity of 2 million gallons. The pond was sized in accordance with Chapter 401.4(C)(7) of the Rules.

The proposed leachate storage pond will be surrounded by a 10-foot wide containment dike and will be approximately 46,500 square feet in size at the top. A 15-foot wide trapezoidal shaped emergency spillway will be constructed 12 inches below the top of the dike to allow for a controlled outflow of liquid if an unforseen event were to overflow the containment dike.

In response to staff technical review comments, James River has proposed an Action Leakage Rate ("ALR") of 20 gallons/acre/day for the leachate storage pond. This represents the minimum rate of leakage that will trigger interaction between James River and the Department to determine the appropriate response action for the leakage. The ALR will apply to the primary liner of the pond and it also represents the amount of liquid expected to be found in the leak collection/detection system in gallons/acre/day. A Response Action Plan has also been

prepared; the plan will be used when the ALR has been exceeded or upon the exceedence of a "rapid and large leakage" rate of 1000 gallons/acre/day. Staff have reviewed the plan and recommend approval.

James River proposes to install an alternative liner system at the faciltity and requests a variance from the provisions of Chapter 401.4(C)(2) of the Rules. The proposed leachate storage pond will have a double liner system, a leak detection system, and a ground water underdrain system. An 80-mil HDPE FML will overlay 15 inches of a coarse sand material containing 6-inch diameter perforated pipes for leak detection. Beneath the leak detection layer will be a composite liner consisting of an 80-mil HDPE FML, 12 inches of 1-inch minus sreened till, a bentonite geocomposite liner, and 12 inches of 3-inch minus screened till. An underdrain system consisting of 12 inches of sand containing 6-inch diameter perforated pipes will be placed below the liner system to relieve upward gradient ground water pressures.

In its variance request, James River states that it proposes to use bentonite in this liner system for the same reasons provided in the above description of the landfill liner system.

The Board finds that James River has demonstrated that its proposed leachate management system will provide for sufficient storage of leachate generated by the facility. The Board also finds that James River has presented clear and convincing evidence that the alternative leachate pond liner system, which includes a bentonite geocomposite liner, complies with the intent of State law and Rules and will provide equal or superior performance to the design standards of the Rules.

D. Gas Management: James River states that the generation of landfill gases results from the anaerobic decomposition of organic matter within the landfill. Since the waste materials identified for placement in the proposed west Old Town landfill are, for the most part, inert and/or not readily degradable, James River does not anticipate that landfill gases will be produced in any sizeable quantities that will require the design of an elaborate gas management system. Instead, the proposed design relies on the leachate collection and transport system to serve as a

conduit for the small quantity of gases that may be generated at the landfill. Upon closure of the upper cells of the landfill, a gas venting system will be designed and installed based on the results of a gas management assessment conducted as part of the final closure design effort.

The Board finds that James River has provided an adequate plan for the management of gas expected to be generated at the facility both during operations and the post-closure period.

E. Closure Design

James River has submitted a plan for the closure of the west Old Town landfill, prepared in accordance with the requirements of Chapter 401.7 of the Rules, except that James River proposes to use an alternative final cover design. The proposed plan includes final cover systems for the sideslope areas and the top of the landfill.

James River requests a variance to Chapter 401.7(C)(4)(a) of the Rules which specifies the final cover system. James River proposes only an alternative cover system; the proposed closure design meets the other requirements of Chapter 401.7(C) of the Rules. As the basis for its request, James River states the proposed system will meet or exceed the hydraulic conductivity requirements of the Rules.

The sideslopes are proposed to be closed out with (from top to bottom) 6 inches of cover material suitable to support vegetative growth; a 12-inch sand drainage layer with a hydraulic conductivity of $1x10^{-2}$ cm/sec; 24 inches of compacted till or marine clay with a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec; and 12 inches of sand drainage layer with a minimum hydraulic conductivity of $5x10^{-3}$ cm/sec. Geonet will be used along the toe of the landfill slope and along the uphill side of the terrace ditches to provide additional drainage capacity where potential head build-up could occur; the extent of the geonet will be determined as part of the final closure design. A Low Density Polyethylene FML will be installed along the flatter portion of the landfill sideslope within the terrace ditches to increase the hydraulic performance of the sideslope cover system. The proposed cover system

will meet the minimum performance requirements of Chapter 401.7(C)(2) of the Rules.

The top is proposed to be closed out with (from top to bottom) 6 inches of cover material suitable to support vegetative growth; a 12-inch sand drainage layer with a minimum hydraulic conductivity of $5x10^{-3}$ cm/sec, a composite liner system consisting of an HDPE FML, 12 inches of compacted till and a bentonite geomembrane liner, and 12 inches of sand drainage layer with a minimum hydraulic conductivity of $5x10^{-3}$ cm/sec.

James River recognizes that the proposed closure plan is conceptual in nature; as the landfill nears capacity, a closure plan for the facility will be prepared and submitted to the Department for its review and approval. The closure plan will include a design report which includes an analysis of the subsurface conditions at the site, a schedule describing the closure procedures to be undertaken, the required information concerning the cover source material, a surface water drainage control plan, a leachate and gas monitoring and control plan, a final grading plan, a QA/QC control plan, a schedule for public notification, copies of compliance inspections, establishment of permanent records of the facility, and a post-closure monitoring and maintenance program.

The Board finds that James River has presented clear and convincing evidence that the alternative final cover system proposed above complies with the intent of State law and Rules and will provide equal or superior performance to the standards in the Rules. The conceptual closure plan was prepared in accordance with the requirements of the current Rules; a final closure plan must be submitted to Department for its review and approval prepared in accordance with the Rules in effect at the time of final closure of the facility.

F. Slope Stability: Prior to initial construction, the surface soils of the site will be graded to slope at up to 6 percent. Following the liner construction, the landfill will be constructed in horizontal lifts in a phased sequence. The phased approach will result in discrete areas of the landfill receiving sludge in order to control runoff and promote sludge drainage. Final thicknesses of the waste are expected to range from several feet near the

outside toe of the landfill to as much as 60 feet in the interior portions. Both the liner system and the primary and secondary sludges were evaluated for strength characteristics.

The principal waste to be placed at the landfill will be combined primary and secondary paper mill sludge from James River's mill. Prior to filling operations at the west Old Town facility, James River plans to install a new screw press at its mill for purposes of sludge dewatering. Shear strength of the sludge planned to be delivered to the landfill was determined using a sludge sample obtained from a screw press pilot study conducted by James River in the spring of 1991. Following permanent installation of a screw press at the mill, additional shear strength testing will be performed to verify earlier test results. James River also proposes to perform additional shear strength testing/evaluation in the event James River's sludge characteristics change significantly.

Landfill stability was evaluated in terms of factors of safety resisting slope movement using a generalized geometry representative of worst case conditions at the landfill. The geometry was represented as 3 discrete material layers, thereby allowing specific comparative evaluation of interface shear strengths between the soil units and the synthetic materials within the liner.

Two potential failure conditions were evaluated for the landfill: movement of a wedge of waste by sliding along a plane within the liner system, and rotation of a circular surface allowed to penetrate the sludge, liner components, and/or foundation soil. Factors of safety resisting landfill instability were calculated to be greater than 1.5 for long-term conditions and 1.25 for short-term conditions. In performing the earthquake analyses, a horizontal seismic coefficient of 0.1g was utilized. Based on the calculated factors of safety, it appears failure of the landfill as a consequence of sliding along a component of the liner system, although improbable, is the more likely failure mechanism for overall instability.

The computed safety factors of 1.5 or greater for this condition indicate a stable landfill configuration will be maintained. SME concludes in its report that James River

should take the following actions during construction and operation of the west Old Town landfill:

- The slopes of the landfill should not exceed 3 Horizontal:1 Vertical.
- Any wastes with unexpected low strength values (such as lime mud, lagoon dregs or secondary sludge) should be placed away from the landfill's exterior sideslopes.
- The surface of the landfill should be maintained such that no pockets of standing water are allowed.
- Waste placement techniques should be periodically reviewed by a qualified geotechnical engineer to allow for operational recommendations which could further enhance stability.
- Laboratory testing to determine interface friction angles between the soils and geosynthetics used in the liner system should be finalized and the stability re-evaluated, if necessary.
- The landfill should be routinely inspected by a qualified geotechnical engineer to examine the landfill for signs of instability.

In addition to the above measures, staff recommend that piezometers be placed in Cell 1 of the landfill to monitor the leachate head of the waste; the design was based on a level of liquid in the waste of less than 12 inches. James River agreed to install piezometers in Cell 1 in the May 12, 1993 SME submittal; no plan proposing specific locations for the instruments has been provided.

The placement of piezometers in Cell 1 was Stipulation #3 of the City's Resolution. Stipulation #6 of the City's Resolution was that James River be required to periodically review the site operations, and have an independent geotechnical review of the site stability performed and modifications suggested, if necessary. Stipulation #7 of the City's Resolution was that "weak wastes" be placed at least 15 feet from the exterior sideslopes of the landfill in order to maintain the landfill's stability.

The Board finds that the landfill will remain stable provided James River complies with all of the technical recommendations it was provided, as set forth above, and that it submits a detailed plan for the installation and

monitoring of the piezometers in Cell 1 to the Department for review and approval prior to operation of the landfill.

G. Engineered systems assessment: James River prepared a hypothetical failure analysis of the various design components and engineered systems of the west Old Town landfill facility. The potential failures discussed in the report are mostly events with an extremely low probability of occurrence. This failure analysis is presented in order to provide a more detailed description of the basis for certain design features and for contingency planning purposes so that if an unlikely failure does occur, a plan of action will be quickly implemented. The analysis focuses primarily on contained failures, where contaminants are not released to the environment but could ultimately be released if not detected and corrected (see Finding of Fact 28 for a discussion of uncontained failure); the analysis provides a more detailed description of the basis for certain design features and for contingency planning purposes so that if an unlikely failure does occur, a plan of action will be quickly implemented.

The major engineered systems of the west Old Town landfill facility are as follows: the cover system, the waste placement system, the waste containment dikes, the leachate collection system, the liner system, the underdrain system, the leachate collection pond, the leachate pump station and loading station, the stormwater management control system and the gas management control system. For each of the systems, the report describes the failure scenario with its cause and effect on the landfill, a description of how the failure will be observed or identified, a description of how preventative measures will be taken to avoid the various failures, and a description of the possible mitigative measures that will be implemented to correct the problem and prevent its recurrence.

In summary, the majority of the engineering system failures examined would be prevented by adhering to the QA/QC construction monitoring procedures and the construction specifications described in the application, or through the routine maintenance procedures described in the Operations Manual approved for the facility. In addition, many of the engineered systems have been over-designed to prevent the occurrence of certain design failures. Mitigation of an engineered system failure will be performed only after a

detailed investigation has been performed to identify the cause of the failure so that the problem can be properly corrected and prevented from recurring. The Department would be notified before initiation of any major mitigation activities at the facility; where necessary, the Department will require that a plan be submitted for review and approval prior to mitigation work being started.

The Board finds that James River has demonstrated that it has assessed the potential failure of all engineered systems and its mechanism for detecting and correcting a failure of an engineered system.

30. CONSTRUCTION

James River intends to initiate construction of Cell 1 of the proposed landfill in the fall of 1993, and intends to begin operations at the landfill in the fall of 1994. The landfill will be constructed by a general contractor who has demonstrated familiarity and experience with the various aspects of landfill construction, and been selected through the competitive bid process.

The application includes a QA/QC program. The program includes source testing to demonstrate compliance with material specifications and construction testing to demonstrate that the materials have been properly installed. The application includes a separate QA/QC program for the liner installations. James River has agreed to amend both programs to incorporate staff technical review comments; the May 12, 1993 SME submittal complies with the individual review comments.

At staff's suggestion, James River proposes to conduct a test pad program for the till liner as part of the overall QA/QC program for the project. The results of the test pad program can then be used to reduce the burden of barrier soil testing during construction. Staff reviewed the proposed test pad program, provided comments on the plan in a technical review memo dated June 18, 1993, and James River has agreed to incorporate the Department's comments into the test pad program.

A complete construction specifications package, including all changes made in response to staff review comments, information gathered from the test pad program, and revised design plans

will be submitted to the Department for review and approval prior to the start of construction. James River has submitted a Quality Assurance ("QA") manual for the construction of the geosynthetic components of the west Old Town landfill facility that incorporates all staff review comments (Exhibit 8 of the May 12, 1993 SME submittal). The QA manual for the earthwork construction will be prepared after the results of the test pad program are available. The Quality Assurance Plan incorporating all changes made as a result of staff review comments, the results of the test pad program, and both the earthwork and geosynthetic QA manuals will be submitted along with the complete specifications package. Staff will review and comment on the complete specifications package and both QA manuals as part of a single review. All 3 parts must be reviewed and approved by the Department prior to the start of construction activity. James River will submit the name and qualifications of a proposed independent third party liner construction quality assurance party to the Department for its review and approval prior to the start of construction of each cell of the landfill.

If any changes to specifications related to the design work of the project within the boundaries of any cell of the landfill, leachate pond or leachate loading station are required during construction of the facility, James River will submit a proposed Change Order to the Department for review and approval prior to making the change. Staff have agreed to review and comment on all proposed changes as quickly as possible, either by telephone or facsimile, and document the response in writing; no changes may be made without the Department's approval.

Weekly inspection reports will be submitted to the Department during construction of each cell of the landfill. Photographs will be taken during each stage of construction to document the construction of each cell. Upon completion of construction of each cell, record drawings will be prepared and submitted to the Department within 30 days. A final construction report will be submitted by James River to the Department within 30 days following the completion of construction of each cell. The report will contain a certification that the project has been constructed in accordance with the approved plans and specifications, and will contain a request that the Department conduct an inspection of the cell and grant approval for operations in

that cell to begin. The final construction report will also include the Third Party Geomembrane Certificate.

James River has submitted detailed design plans only for the construction of Cell 1 of the landfill; James River proposes to submit design plans, including any proposed changes in the specifications, and a narrative description of any changes in the design or operation of each cell, to the Department for review and approval prior to the construction of each cell of the landfill.

The Board finds that James River has designed and will construct Cell 1 and the landfill's ancillary structures in conformance with current accepted practices, and statutory and regulatory requirements, provided finalized QA plans and specifications packages are approved prior to initiation of construction and are implemented as approved. The Board also finds that James River will submit to the Department for its review and approval detailed design plans and narrative descriptions of any changes proposed prior to the construction of each additional cell, and that the Board may require changes in the design of additional cells if, after written notice and opportunity for a hearing, it finds that such changes are necessary to protect public health and safety or the environment.

31. WASTE CHARACTERISTICS

James River states that the mill currently produces, on average, approximately 150,000 cubic yards of production residuals which require land disposal. The majority of the wastes are classifed as special wastes. The wastes proposed for disposal at the west Old Town landfill are:

- approximately 106,000 cubic yards per year of pulp and paper mill wastewater sludge (both primary and secondary sludge)
- approximately 21,000 cubic yards per year of lime wastes and grit
- approximately 23,000 cubic yards per year of woodwaste and inert debris
- small quantities of soil and sawdust contaminated with process chemicals that are high in pH, but have been effectively neutralized and rendered non-hazardous as outlined in the mill's SPCC plan or as required by the Department

- approximately 40 cubic yards per year of virgin oily contaminated debris consisting of soil, rags, absorbent materials, oil filters, crushed grease drums, and waste grease
- sand from sandfilters
- non-hazardous sand from sandblasting

James River also utilizes approximately 50,000 cubic yards of gravel per year, as necessary, in operating its Milford landfill. James River therefore concludes that it requires disposal capacity for up to 200,000 cubic yards of waste per year. The mill is evaluating the potential benefits of a recycled fiber plant and the installation of an additional boiler, and it may at some point in the future request approval from the Department to dispose of wastes from these activities at the west Old Town landfill. Approximately 70,632 cubic yards of waste were disposed of in the Milford landfill during the 1992 Annual Report period due to the waste reduction efforts described in Finding of Fact 33. However, production at the mill is expected to increase in the future, thus increasing the quantity of residuals requiring disposal.

James River has performed physical characterization of the sludges. The primary and secondary sludges were tested to determine solids content, ash content and shear strength properties. The quantities of the other wastes proposed for disposal are small in relation to the quantity of sludge, and therefore will have no significant impact on the overall performance of the landfill in terms of stability.

James River has performed chemical characterization of the sludge, dry lime, lime mud, grit, and woodwaste proposed for disposal in accordance with Chapter 401.3(A)(2) of the Rules. The wastes were found to be non-hazardous. A summary of the analytical data resulting from the characterization of the various wastes is presented in Volume IV, Table 3-2. James River did not supply analyses of the other wastes in its application. The other wastes are typically analyzed by Department Response Services staff in the field prior to disposal.

James River has also tested the wastes proposed for disposal at the west Old Town landfill for compatability with all components of the landfill and leachate collection systems using the procedures set forth under U.S. EPA Method 9090.

The testing shows the leachate produced by the landfill will be compatible with all the design components.

An expert witness for CARD testified during the proceeding that the proposed landfill is positioned upgradient from a relatively large wetland complex which is connected to a larger complex, and that the heavy metals in the waste, even if present in only small amounts per unit volume of waste, may bioaccumulate once they reach aquatic ecosystems through either chronic minor failures or a major failure of the landfill system. The witness recommends that James River be required to provide a listing of all potentially toxic substances expected to be in the landfill's leachate, an assessment of each substance's capability to bioaccumulate, and a side-by-side comparison of leachate quality and the drinking water standards. He also recommends that James River calculate the total amount of toxic materials which will be in the landfill at capacity and compare it to what would naturally occur on the property, and that a risk assessment be done to characterize the potential impacts on the downgradient wetlands/aquatic system from the failure of the system.

James River conducted an analysis for the project to determine the expected travel time of pollutants if a major failure of the landfill occurred. (See Findings of Fact 27 and 28.) The results of the failure analysis indicate a travel time of 10 years to the nearest protected natural resource.

James River also conducted an engineered systems assessment and concluded that, even assuming no attenuation of leachate, the dilution ratio for the estimated 7-day average low flow within a 10-year recurrence level is so high that a failure of any engineered system would not pose an unreasonable threat to surface water quality.

James River is required to perform routine sampling of its leachate. (See Finding of Fact 37.)

The Rules require that an applicant provide a physical and chemical characterization of each special waste to be disposed of through analyses of representative samples of the wastes for the following: EP Toxicity Characteristics (now the TCLP exam), Reactivity Characteristics, Ignitability Characteristics, and additional parameters identified by the Board or Department. The Rules require that an applicant characterize its wastes to determine the wastes' non-hazardous

nature and their compatability with the design of the landfill and other wastes disposed of in the landfill. The characteristics of the wastes proposed for disposal at the west Old Town landfill will be the same as those of the wastes presently disposed of at James River's Milford landfill except that the characteristics of the wastewater sludge may change slightly after the screw press is installed at the mill's wastewater treatment plant. (See Finding of Fact 33.) The wastes currently disposed of at the Milford landfill are non-hazardous.

The Board finds that James River has shown the wastes proposed for disposal at the proposed west Old Town landfill will be non-hazardous in that they will not differ significantly from those currently disposed of the James River's Milford landfill, and that James River has submitted a plan to adequately monitor the characteristics of the wastes over time.

32. PUBLIC BENEFIT

38 M.R.S.A., Section 1310-N(3) provides that, subsequent to the initial adoption of the State plan, and for those facilties not subject to Chapter 24, subchapter IV (38 M.R.S.A., Sections 2154-2164), the Department shall employ a rebuttable presumption of public benefit. 38 M.R.S.A., Section 2163 provides that generator-owned facilities are exempt from Chapter 24, subchapter IV, provided the solid waste disposal facilties are used exclusively for the disposal of waste generated by the owner of the facility except that the facility may accept, on a non-profit basis, no more than 15 percent of all solid waste accepted on an annual average that is not generated by the owner.

James River states that the west Old Town landfill is designed to fulfill James River's solid waste disposal needs for the next 15 to 20 years, and that it will provide for the disposal of approximately 3 million cubic yards of waste that would otherwise require disposal at another landfill in Maine licensed to accept special waste, and that the development of the west Old Town landfill is critical to the continued operation of the Old Town mill.

Mr. Dufour recommends that the Board should require James River to proceed with a smaller facility that lowers the final

height of the landfill, reduces wetland impact, and avoids areas with shallow depth to bedrock.

Stipulation #9 of the City's Resolution was that the Board not allow any waste generated outside the mill be disposed of in the proposed west Old Town landfill. The Board can not limit the acceptance of wastes beyond the provisions of 38 M.R.S.A., Section 2163(2); however, James River stated during the public hearing that it does not intend to import wastes.

The Board finds that the construction and operation of the west Old Town landfill will provide a public benefit, and that the size and the location of the landfill is justified.

33. RECYCLING AND SOURCE REDUCTION

The following recycling and source reduction programs have been instituted at James River's Old Town mill:

- James River has reduced the generation of wastes requiring disposal at its Milford landfill by approximately 17,500 tons per year through process modifications in the lime recovery area and by optimization of the operation of the waste water treatment plant.
- James River has instituted a recycling program at the mill which currently includes office paper, corrugated material, steel baling wire, wood knots and rejects, broke paper, parts cleaning solvents, metal salvage, and chemical barrels. Approximately 17,000 tons per year of these materials are recycled/utilized. Of this amount, 10,000 tons per year would have required disposal at the landfill. Through its recycling program, James River has reduced the amount of mill solid waste delivered to the City of Old Town's transfer station/demo disposal facility by between 30 and 38 percent.
- A state-of-the-art screw press will be installed at James River's wastewater treatment plant. The press is designed to dewater the primary and secondary sludges to 40 percent solids; the existing belt press dewaters the sludges to 23 percent solids. The new press will also eliminate the current need to add sawdust to the sludges as a bulking agent and further reduce the quantity of waste to be landfilled.

The mill's current waste reduction and recycling programs have reduced the total waste stream leaving the mill by approximately 34,500 tons annually; approximately 27,500 tons per year of the total amount is a direct reduction of material that in the past required disposal at the Milford landfill.

Stipulation #8 of the City's Resolution was that James River be required to have an operating screw press at the mill prior to operation of the landfill.

The Board finds that the proposed west Old Town landfill facility will accept waste that is subject to recycling and source reduction programs at least as effective as those imposed by State law, that James River has shown consistency with the recycling provisions of the state plan, and that the volume of the wastes and the risks related to their handling and disposal have been reduced to the maximum practical extent by recycling and source reduction prior to disposal.

34. CRIMINAL/CIVIL RECORD

James River provided a Criminal and Civil Record for James River Paper Company, Inc. based on its review of the best available records for the past 10 years. James River indicates it has interests in over 100 manufacturing facilities in 27 states, and Canada, Mexico and 10 European countries. The listing in the Record provides the information required by Chapter 400.4(H)(1)(a) of the Rules. James River lists 18 individual enforcement actions against it and 2 suits James River has filed against the State of Maine. Six of the 18 actions were violations of Maine environmental laws; 4 of the 6 actions were due to violations of regulations administered by the Department's Bureau of Water Quality Control.

CARD argues that James River has a poor record of environmental compliance as demonstrated by the criminal/civil record it submitted and by 2 additional actions CARD entered into the record (Exhibits #4 and #7). James River argues that neither of these exhibits are required to be added to the list of enforcement actions because Exhibit #4 is an action against James River Graphics, Inc. (formerly a separate wholly-owned subsidiary of James River Corporation) and Exhibit #7 is not an action related to environmental laws (Exhibit #7 is an action alleging violations of OSHA laws).

The Board finds that James River has filed an accurate Criminal/Civil Record and that all the violations of Maine environmental regulations have been resolved through Administrative Consent Agreements and Orders, and that the majority of the violations of environmental laws in other States have been resolved.

35. ESCROW CLOSURE ACCOUNT

James River proposes to establish a trust account to cover the estimated costs for the closure and post-closure care of the proposed facility. James River requests a variance from the provisions of Chapter 400.10 of the Rules. James River states that the proposed language effectively integrates the concepts contained in Rules and allows a more efficient utilization of James River's resources.

The proposed escrow account includes cost estimates based upon third-party closure and post-closure care using available cost information for laboratory costs, equipment rental rates, labor, etc. Costs are projected for a period of 30 years beyond final closure of the facility. The costs of items listed by James River were reasonable estimates, but staff recommended that several additional line items should be added. James River has added reasonable costs for each of the items identified by staff.

CARD argues that the design of the facility will cause it to leak beyond the 30-year post-closure period and that James River is not required to maintain the facility beyond that time. The 30-year post-closure period is set by 38 M.R.S.A., Section 1310-P. At the end of that time, the Department will review the facility records and recommend a program, if necessary, for care of the facility beyond that point. The statutory language is not meant to imply responsibility for the facility ends after 30 years.

Review of the proposed trust agreement is on-going. The Letter of Credit funding mechanism proposed by James River appears acceptable, but additional clarifications (such as frequency of payments into the account, and the separation of closure and post-closure funds) are needed before the agreement is finalized.

Stipulation #5 of the City's Resolution was that the Board require James River to provide a Letter of Credit of

sufficient amount to ensure the cost of properly closing the facility in the event that James River defaults before operation of the facility begins. For the purpose of demonstrating compliance with State law, James River has demonstrated financial capacity for the development.

The Board finds that the use of a Letter of Credit funding mechanism instead of cash payments complies with the intent of the Rules. The Board also finds that operation of the west Old Town landfill cannot commence until an escrow closure ageement or similar closure and post-closure financial assurance mechanism has been finalized and executed by James River and the Department.

36. OPERATIONS

James River has submitted an Operations Manual that is in substantial compliance with Chapter 401.6 of the Rules. In response to staff comments, James River has agreed to modify sections of the manual addressing environmental monitoring of the site, construction of future cells during operation of the facility, the maintenance of the erosion control facilities, the addition of language specifically limiting the open area of the landfill to no more than 7.5 acres after the construction of the Cell 1, and geotechnical operational measures and monitoring of the site as requested by the City and staff during review of the project.

Request for variance to use sludge as daily cover: James River requests a variance from Chapter 401.6(B)(8)(i) of the Rules concerning the placement of a coarse-graded soil daily cover. It proposes to use its paper mill sludge as daily cover, and notes that daily cover is required to minimize problems with fires, odors, rodents and other vectors, and litter. James River states that due to the nature of the proposed waste none of these will be a problem at the west Old Town landfill, and that denial of the variance request would be an unnecessary financial burden and would significantly diminish the life of the landfill.

Peter Dufour recommends that the use of sludge as daily cover be reviewed by the Department periodically throughout the life of the project and that the Board consider the capacity James River gains from the granting of this variance request in reviewing the size of the proposed landfill.

Staff recommend approval of the variance, and comment that odors have never been noted as a problem at James River's Milford landfill and that landfills for the disposal of pulp and paper mill residuals are usually granted this variance. However, the Milford landfill is more isolated from residences than this proposed landfill, and therefore a periodic review of odors associated with the landfill is appropriate.

The Board finds that the use of paper mill sludge instead of coarsely-graded soil as daily cover complies with the intent of the Rules.

Request for variance to intermediate cover standards: James River requests a variance to Chapter 401.6(B)(8)(ii) of the Rules concerning the type and timing of placement of intermediate cover. James River proposes to place either a geosynthetic membrane liner or 12 inches of soil with a minimum fines content of 15 percent on inactive areas of open cells that have not reached final grade in conjunction with the construction of the next cell. The Rules require 12 inches of soil with a minimum fines content of 35 percent be placed on areas to be inactive for longer than 4 weeks. In support of its request, James River notes that the placement of interim cover more often than as proposed would create an unnecessary operational burden and waste resources, and that the proposal would provide for a more free-draining and stable waste configuration. Staff recommend approval of the variance.

The Board finds that the use of a geosynthetic membrane instead of 12 inches of soil with a minimum fines content of 15 percent, and the placement of intermediate cover consisting of either a geosynthetic membrane or 12 inches of soil with a minimum fines content of 15 percent on inactive areas of open cells that have not reached final grade in conjunction with the construction of the next cell complies with the intent of the Rules.

Request for variance to operational final cover standards: James River requests a variance to Chapter 401.6(B)(8)(iii) of the Rules concerning the timing of the placement of operational final cover. James River proposes to place the final cover system described in Finding of Fact 29(E) to areas of the landfill that have reached final grade. The Rules require that operational final cover be placed in areas where disposal will not take place within the next 6 months. In

support of its request, James River states the placement of final cover in areas that have not reached final grade would require the future removal and rework of the geosynthetic and geocomposite liner materials. Staff recommend approval of the variance request.

The Board finds that the placement of the final cover system to areas of the landfill as they reach final grade instead of in areas of the landfill which will be inactive for longer than 6 months complies with the intent of the Rules.

Request for variance to requirement for a tire wash facility: James River requests a variance to Chapter 401.6(B)(2)(c) of the Rules and 401.6(B)(10). James River proposes to use effective maintenance and operational practices to prevent the accumulation of dust, mud or waste materials on roads. In support of its request, James River states haul trucks will travel approximately 3 miles of roads owned by James River before entering a public road (Route 16), and that little, if any, sludge will remain on the vehicles' tires when they arrive at Route 16. It also states the access roads will be regularly maintained and cleaned to prevent the accumulation of waste or mud materials within the property limits of the facility, and that winter operation of a tire wash facility would be virtually impossible.

CARD argues that the requested variance should not be granted because the sludge falling off the tires of the haul vehicles exiting the facility will enter the protected natural resources (streams and Wetland #9) located along the primary access road.

James River has committed to a road maintenance program, and such programs have proven to be effective at other facilities for controlling the accumulation of materials. It is also noted that any impact to the water quality from vehicle passage on the access road would likely be minimal and that surface water testing results would likely remain at pre-construction levels. Staff recommend the variance be granted, but that James River be required to establish 3 surface water monitoring points along the primary access road, at locations reviewed and approved by the Department, collect background data prior to operation of the facility, and to sample the 3 locations for the same parameters as the other surface water monitoring points (see Finding of Fact 37) on an annual basis for the first 5 years of operation of the facility. After 5

years, James River should submit a narrative summary of the monitoring results and a proposal for changes to, or cessation of, the monitoring program, including a plan for remedial action if necessary, to the Department for its review and approval.

The Board finds that regular cleaning and maintenance of the access road instead of the installation of a tire wash facility complies with the intent of the Rules.

Summary: A complete review of the operations manual, including the modifications already made by James River, will be completed by staff after this decision on the application. Prior to operation of the facility an operations manual must be approved by the Department.

The Board finds that James River has submitted an operations manual prepared in compliance with Chapter 401.6 of the Rules, but that a finalized operations manual must be prepared, and that James River has demonstrated its variance requests comply with the intent of the applicable operational regulations.

37. ENVIRONMENTAL MONITORING PROGRAM

The application contained an environmental monitoring plan prepared in accordance with the requirements of Chapter 401.6(C) of the Rules. The plan provides for the monitoring of ground and surface

water, the sampling and analysis of wastes, and the reporting of all results to the Department. (See Finding of Fact 31.)

Staff reviewed the ground and surface water components of the environmental monitoring plan, and recommends approval of the plan as amended through the review process. The amendments addressed technical review comments on the methods of statistical interpretation proposed to be used on the monitoring data.

The plan includes the baseline surface water quality information gathered from the nearby intermittent stream; although the results are not atypical, color values and tannin-lignins were high, and sodium and iron were low. James River notes that natural variation in the surface water data is expected to be greater than the 2 sample events indicate.

JAMES RIVER PAPER COMPANY, INC. Old Town, Penobscot County, Maine WEST OLD TOWN SECURE LANDFILL FACILITY #S-20700-7A-A-N (APPROVAL WITH CONDITIONS)	59 SITE LOCATION OF DEVELOPMENT, SOLID WASTE, AND NATURAL RESOURCE PROTECTION ORDER, AND WATER QUALITY CERTIFICATION FINDINGS OF FACT AND ORDER

Baseline ground water quality information was collected from 9 monitoring wells.

James River proposes to monitor surface water quality at 3 locations along the unnamed stream west of the facility, shown in Figure 7-5 of Volume III, in the future; the sedimentation/detention pond will also be monitored. Parameters proposed for the program are temperature, specific conductance, color, tannin-lignins, COD, sodium and dissolved oxygen. The parameter pH should be added to the list of parameters. Monitoring location SW-3 is not located on property owned by James River, nor has James River demonstrated that it will have access to the sampling point, so James River will need to propose a sampling location where access is possible.

Stipulation #7 of the City's Resolution was that James River be required to continuously monitor the above stream.

James River proposes to monitor ground water quality in 12 surficial and bedrock wells at this time. Two locations will be new wells; the other 10 wells are currently in existence. Parameters proposed for the program are sodium, chloride, hardness, Eh, pH, specific conductance, iron, temperature and manganese.

CARD argues that the 2 up-gradient wells, MW-207 and MW-212, will need to be abandoned 8 years after operation of the landfill begins (because of landfill operations in that area) and therefore the facility does not have the 2 up-gradient wells required by Chapter 401.6(C)(1)(a)(i)(BB) of the Rules. The Board finds, based on staff's review of the hydrogeologic information available, that the data collected up to that time plus the possibility of establishing future, representative monitoring points elsewhere on the property (at the location of current piezometers P-13) provide reasonable assurance that the site will be monitorable during its operational life.

The Board finds that James River has submitted an adequate environmental monitoring plan provided the additional parameters and locations noted in this Order are included in a finalized plan.

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BASED on the above FINDINGS OF FACT, the Board makes the following CONCLUSIONS pursuant to the Natural Resources Act, 38 M.R.S.A., Section 480-A et seq., and Section 401 of the Federal Water Pollution Control Act:

A. The proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational or naviagational uses.

B. The proposed activity will not cause unreasonable erosion of soil or sediment and will not inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment, provided that all measures contained in the approved Erosion Control Plan are adequately implemented and maintained.

C. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, aquatic habitat, travel corridors, freshwater, estuarine or marine fisheries or other aquatic life, provided James River operates the facility and manages the property as proposed and provided that James River submits annual reports on the wetlands restoration/enhancement to the Department.

D. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.

E. The proposed activity will not violate any state water quality law, including those governing the classifications of the State's waters.

F. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.

G. The proposed activity is not on or near a sand dune system.

H. The proposed activity is not on an outstanding river segment as noted in 38 M.R.S.A., Section 480-P.

JAMES RIVER PAPER COMPANY, INC. Old Town, Penobscot County, Maine WEST OLD TOWN SECURE LANDFILL FACILITY #S-20700-7A-A-N (APPROVAL WITH CONDITIONS)	) 61 SITE LOCATION OF) DEVELOPMENT, SOLID WASTE,) AND NATURAL RESOURCE) PROTECTION ORDER, AND) WATER QUALITY) CERTIFICATION) FINDINGS OF FACT AND ORDER

BASED on the above FINDINGS OF FACT, the Board makes the following CONCLUSIONS pursuant to the Maine Hazardous Waste, Septage and Solid Waste Management Act, 38 M.R.S.A., Section 1301 et seq., and the Site Location of Development Act, 38 M.R.S.A., Section 481 et seq.:

A. James River has provided adequate evidence of financial capacity and technical ability to meet air and water pollution control standards.

B. James River has made adequate provisions for traffic movement of all types into, out of or within the development area. Any traffic increase attributable to the proposed development will not result in unreasonable congestion or unsafe conditions on a road in the vicinity of the proposed development.

C. James River has made adequate provision for fitting the development harmoniously into the existing natural environment and the development will not adversely affect the existing uses, scenic character, or natural resources in the municipality or in neighboring municipalities, provided the facility is properly operated, properly closed, and properly cared for after closure.

D. The proposed development will be built on soil types which are suitable to the nature of the undertaking and will not cause unreasonable erosion of soil or sediment nor inhibit the natural transfer of soil.

E. The proposed development will not pose an unreasonable risk that a discharge to a significant ground water aquifer will occur in that the facility is not located over a significant sand and gravel aquifer and the proposed development does not pose an unreasonable threat to the quality of a significant sand and gravel aquifer which it does not overlie, or to an underlying fractured bedrock aquifer, in that the low permeability glacial till under the development, combined with the ground water flow directions, provide maximum protection to water quality.

F. The proposed development will not pollute any waters of the State, contaminate the ambient air, constitute a hazard to health and welfare, or create a nuisance. Compliance with the intent of the Solid Waste Management Rules has been affirmatively demonstrated.

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G. The proposed generator-owned solid waste disposal facility provides a substantial public benefit.

H. James River has demonstrated the volume of the waste and the risks related to its handling and disposal have been reduced to the maximum practical extent by recycling and source reduction prior to disposal.

I. James River has made adequate provisions for controlling erosion provided the approved Erosion and Control Plan is fully implemented.

J. James River has adequately addressed the stability of the proposed facility provided it performs the necessary geotechnical monitoring.

K. James River has shown that the proposed facility will not result in an unlicensed direct or indirect discharge of pollutants to a classified body of water.

L. James River has shown that its past violations of certain environmental laws as described in its criminal or civil record will not prevent it from operating the facility in compliance with Maine laws and regulations in that James River has entered into consent agreements and conducted corrective actions to resolve violations.

M. James River has made adequate provision for utilities, including water supplies, sewerage facilities and solid waste disposal, roadways and open space required for the development and the development will not have an unreasonable adverse effect on the

existing or proposed utilities, roadways and open space in the municipality or the area served by those services or open space.

N. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties nor create an unreasonable flood hazard to any structure.

O. The proposed activity is not located on or near any sand dune system.

JAMES RIVER PAPER COMPANY, INC. Old Town, Penobscot County, Maine WEST OLD TOWN SECURE LANDFILL FACILITY #S-20700-7A-A-N (APPROVAL WITH CONDITIONS)	63 SITE LOCATION OF DEVELOPMENT, SOLID WASTE, AND NATURAL RESOURCE PROTECTION ORDER, AND WATER QUALITY CERTIFICATION FINDINGS OF FACT AND ORDER

P. James River has demonstrated that the proposed escrow closure account will accrue an amount sufficient to satisfy the estimated costs of closure and post-closure care and maintenance of the proposed facility, provided the account is activated prior to the operation of the facility.

THEREFORE, the Board APPROVES the nine variance requests described in the Findings of Fact, above, and the application of JAMES RIVER PAPER COMPANY, INC. to construct and operate the West Old Town Landfill Facility in Old Town, Maine SUBJECT TO THE FOLLOWING CONDITIONS AND ALL APPLICABLE STANDARDS AND REGULATIONS:

1. The Standard Conditions of Approval, a copy of which is attached as Appendix A.

2. In addition to any specific erosion control measures described in Finding of Fact 12 of this Order, James River shall take all necessary actions to ensure that its activities or those of its agents do not result in noticeable erosion of soils or fugitive dust emissions on the site during the construction and operation of the project covered by this approval.

3. Within 60 days after all permits have been acquired, James River shall file a finalized Declaration of Covenants and Restrictions with the Penobscot County Registry of Deeds. Evidence of such filing shall be submitted to the Department, Bureau of Hazardous Materials and Solid Waste Control, within 15 days of the filing date.

4. James River shall submit to the Department, Bureaus of Land Quality Control and Hazardous Materials and Solid Waste Control, annual reports for a 3 year period on the restoration and enhancement of on-site wetlands in accordance with the approved Compensation Plan.

5. James River shall construct the sedimentation pond as designed and reviewed after the necessary dewatering measures have been implemented and prior to any other grubbing or other construction activity on the site.

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6. James River shall amend the Erosion and Sedimentation Control Plan to include the following measures:
   - All stream crossing shall be done in accordance with Chapter 305, Section 10, Construction Standards 1 through 3 and 5 through 17 of the Department's Regulations.
   - All soil disturbance within 100 feet of a protected natural resource must be done in accordance with Chapter 305, Section 2, Construction Standards 5 through 15 of the Department's Regulations.

7. James River shall perform two additional noise studies, for the purpose of verifying the data contained in the application, and submit the results to the Department for its review. One study shall be performed within the first month of actual operation of the Cell 1 of the landfill. The second study shall be performed within the first month of actual operation of Cell 4 of the landfill.

8. James River shall conduct a supplemental visual analysis, for the purpose of verifying the data contained in the application, within the first month of actual operation of Cell 4 of the landfill and submit the results to the Department for its review.

9. James River shall maintain at least a 100 foot forested buffer between the landfill and the emergent wetland to the southwest of the facility.

10. James River shall submit to the Department for its review and approval a geotechnical monitoring plan containing all actions and recommendations by SME and listed in Finding of Fact 29(F), above, prior to the start of operation of the landfill. The plan shall also specify low strength wastes shall be placed at least 15 feet away from the exterior sideslopes.

11. James River shall conduct the test pad procedure proposed in the May 12, 1993 SME submittal, as modified in response to staff comments, and submit the results of the procedure to the Department for its review and approval prior to the start of construction of the landfill.

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12. James River shall submit a Specifications document, revised design plans and QA plans for earthwork activities to the Department for its review and approval prior to the start of construction of Cell 1. No construction may begin until the Specifications document, the design plans and all QA plans are approved by the Department.

13. James River shall submit the name and qualifications of a proposed independent third party liner construction quality assurance party to the Department for its review and approval prior to the start of construction of each cell of the landfill.

14. James River shall not change any specification related to the design of the project within the boundaries of any cell of the landfill, the leachate pond or the leachate loading station without submitting a Change Order to the Department and receiving approval, verbal or written, from the Department for the change.

15. Prior to operation of the facility, James River shall submit either its executed alternative escrow closure trust agreement along with any changes in the terms of the trust agreement as staff shall recommend for approval, or such other financial assurance mechanism for closure and post-closure care allowed by the Waste Management Act as staff shall recommend for approval.

16. At least 90 days prior to operation of the facility, James River shall submit a revised operations manual, incorporating staff comments on the manual, to the Department for final review and approval. If the final manual has not been approved by the date operation begins, James River may operate the landfill under the manual then under review by staff until such time as a final manual is approved.

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23. James River shall submit to the Department for its review and approval a final closure plan prepared in accordance with the Rules in effect at the time of final closure of the facility, and close the landfill in accordance with the approved final closure plan.

DONE AND DATED AT AUGUSTA, MAINE THIS 28th DAY OF July, 1993.

BOARD OF ENVIRONMENTAL PROTECTION

By: _____
Owen R. Stevens, Chair

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of intial receipt of application: August 6, 1991

Date of application acceptance: October 19, 1991

Date filed with Board of Environmental Protection:

S20700AN/cwd

Vertical Increase & Additional Waste Streams of Original 68 Acre Permitted Landfill Footprint Amendment #S-020700-WD-N-A (2004)

IN THE MATTER OF

STATE OF MAINE, ACTING THROUGH THE	)	SOLID WASTE ORDER
STATE PLANNING OFFICE	)	
OLD TOWN, PENOBSCOT COUNTY, MAINE	)	
VERTICAL INCREASE and	)	
ADDITIONAL WASTE STREAMS	)	
#S-020700-WD-N-A	)	
(APPROVAL WITH CONDITIONS)	)	AMENDMENT

Pursuant to the provisions of Resolve 2003, Chapter 93; 38 M.R.S.A. Section 1301 et seq.; and 06-096 CMR Chapter 400 et seq., Solid Waste Management Regulations, effective September 6, 1999, the Department of Environmental Protection ("Department") has considered the application of the State of Maine, acting through the State Planning Office, with its supportive data, staff review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. APPLICATION SUMMARY

A. Application: The State of Maine, State Planning Office ("SPO" or "the applicant") is applying for an amendment to the original license for the West Old Town Landfill ("WOTL" or "the landfill"); SPO seeks to increase the approved final elevation of the landfill without increasing the horizontal footprint of the landfill, and to dispose of additional waste streams in the landfill.

B. History: The WOTL was licensed by the Board of Environmental Protection on July 28, 1993 as a 15-cell generator-owned landfill for the disposal of pulp and papermaking residuals generated at the Fort James Operating Company's mill in Old Town. Summaries of information on the siting and design of the landfill are contained in the landfill license, DEP #S-020700-7A-A-N ("the original license"). The licensed footprint of the WOTL, including the accessory structures, is approximately 68 acres; it sits on a parcel of land approximately 780 acres in size.

In summary, the landfill is situated on an area of deep glacial till soils with an average fines content of 58% passing the No. 200 sieve. The average till thickness is approximately 30 feet, and after excavation and grading to the proposed base grades of the landfill a minimum of 10 feet of soil above bedrock will remain in all areas. The bedrock consists of

metasediments that are generally competent and occasionally fractured; there was no mapped or observed faulting in the bedrock beneath the site. The site does not overlay, or lie adjacent to, a mapped significant sand and gravel aquifer, nor a mapped high-yield bedrock zone. The proposed facility was found not to cause an unreasonable threat to a significant sand and gravel aquifer, or to a fractured bedrock aquifer. The closest water supply well is located approximately 1500 feet west of the site across a bog and stream, and on the other side of a topographic ridge. The landfill was located on the property in an area where seepage gradients and the site's topography hydraulically isolate it from the regional ground water systems and existing water supplies.

The landfill began operation in December 1996, and cells 1 and 2 have been developed. In addition to the wastes from the Old Town Mill, bottom ash from the Lincoln Pulp and Paper Mill in Lincoln, Maine and burn pile ash from the City of Old Town's transfer station are licensed for disposal in the landfill. Fort James Operating Company is a wholly owned subsidiary of Georgia-Pacific Corporation ("GPC"). The landfill has a composite liner system, and leachate is stored in a pond with a double liner system. Approximately 300,000 tons of waste has been disposed in the landfill. No complaints from the public about any aspect of the landfill's operation were received by the Department prior to the submission of this application.

In April 2003 GPC shut down 2 tissue machines and 13 converting lines at its Old Town Mill. Through negotiations with the Office of the Governor, GPC agreed to continue operation of its mill in Old Town, Maine under certain conditions. One of the conditions was that the State of Maine purchase the company's West Old Town Landfill, and provide disposal capacity for the mill's wastes for a 30 year period. In June 2003, following a public hearing before the Legislature's Natural Resources Committee, the Maine Legislature passed Resolve 2003, Chapter 93 ("the Resolve"). The Resolve authorized SPO to purchase the WOTL from Fort James Operating Company, and to enter into any contracts necessary for the operation of the landfill; however, the landfill will continue to be owned and controlled by the State. SPO initiated a competitive bid

process to select a long-term operator for the landfill. On August 18, 2003, SPO notified Casella Waste Systems, Inc. ("Casella") that it had been selected to be the long-term operator of the landfill, pending successful negotiation of mutually agreeable terms. Actual operations will be by NEWSME Landfill Operations, LLC ("NEWSME Operations"), a company in which New England Waste Services of ME, Inc., a Casella subsidiary, holds the sole membership interest. In accordance with the intent of the Resolve and the terms of the State's Request for Proposals ("RFP"), the operation of the landfill will remain revenue-neutral to the State.

SPO, Fort James Operating Company and GPC signed a purchase and sales agreement, dated November 20, 2003, for transfer of the ownership of the West Old Town Landfill from Fort James Operating Company to SPO; the purchase and sales agreement was executed on February 5, 2004. In addition, SPO and Casella signed an Operating Services Agreement ("OSA") on February 5, 2004. The purchase and sales agreement and the OSA state that the pulp and paper mill wastes currently licensed for disposal in the landfill will continue to be disposed in the landfill for at least 30 years, and that SPO will seek permits to expand the capacity of the landfill. Under the terms of the OSA between SPO and Casella, Casella will pay all costs associated with development, operational and closure/post-closure activities at the landfill.

On October 21, 2003, following public notice as required by 06-096 CMR Chapter 2, the Department issued conditional approval for the transfer of the licenses for the WOTL from Fort James Operating Company to the SPO (DEP #S-020700-WR-M-T and #L-019015-TH-C-T); the transfer became effective when the sale of the landfill to SPO occurred on February 5, 2004. No appeals were filed from this approval.

C. Summary of Proposal: SPO proposes to increase the licensed final elevation of the landfill from 270 feet (which would be about 60 feet above the original ground surface) to 390 feet. This vertical increase would result in the disposal capacity of the landfill being increased from the original estimate of 3.3 million cubic yards to an estimated 10 million

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cubic yards. In addition to the wastes currently disposed in the landfill (sludge from Fort James' Old Town Mill and ash from Lincoln Pulp & Paper), SPO proposes to dispose of the waste streams generated in Maine that are currently accepted for disposal at the Pine Tree Landfill in Hampden, Maine. These waste streams are the following: construction and demolition debris; the residues (ash, front-end process residue and oversized bulky wastes) generated by municipal solid waste ("MSW") incinerators located in Maine; a limited amount of MSW bypass from the incinerators; water/wastewater treatment plant sludge; and smaller amounts of miscellaneous non-hazardous wastes. The proposed vertical increase is expected to provide disposal capacity for approved waste streams for up to 15 years. After construction of a new cell is completed during the summer of 2004 and the additional wastes begin coming to the facility, the applicant estimates approximately 450,000 tons of waste per year will be disposed in the landfill; in the future, that quantity is estimated to potentially increase to 540,000 tons per year. In accordance with the RFP and the OSA between SPO and Casella, waste that is generated outside Maine will not be accepted at the landfill.

The applicant proposes to modify the approved design of the facility by using clay as the earthen part of the composite liner instead of glacial till; by placing a foot of compacted clay beneath the undeveloped portions of the landfill's footprint; by eliminating liner penetrations associated with the leachate removal system and instead installing leachate collection sumps and removal pumps above the liner system; by adding an above-ground storage tank to be used as the primary leachate containment system; and by installing an active gas extraction system as the landfill is developed. To increase the capacity of the landfill, an elevated soil berm will be constructed around the perimeter of the landfill, with the interior toe of the berm within the currently licensed solid waste boundary. The western portion of the berm will be mechanically stabilized using reinforcing geogrids.

The proposal is described in an application dated October 2003 and submitted to the Department on October 30, 2003, and includes several additional submittals prepared in response to comments on the application.

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The application was accepted for processing on November 21, 2003. In addition to meetings held with municipal officials to discuss traffic impacts associated with the facility, a public informational meeting on the application was held on January 21, 2004. A written summary of the questions asked and the answers provided during the public informational meeting is part of the record. A draft license was made available to the public on February 17, 2004. The Department received written comments on the draft license and also participated in a public informational session on February 24, 2004; written comments submitted during that session are included in the record. The Department held 2 days of public sessions on the proposed project on March 29 and 30, 2004. Testimony under oath was accepted, and the sessions were recorded and transcribed. The transcriptions and copies of written comments submitted at these sessions are included in the record. The record was closed to receipt of comments on the application at the close of the last session held on March 30, 2004. The Department prepared a written summary of comments received throughout the processing of the application; this summary is included in the record. The application was reviewed by staff of the Department's Bureau of Remediation and Waste Management, staff of the Maine Department of Transportation, and the outside consulting firm Terrence J. DeWan & Associates. Mr. DeWan's firm provided the review of the updated visual impact assessment through a contract with the Department.

The Department finds that the applicant has provided a plan for all aspects of the development of the additional landfill capacity within the licensed footprint. As is typical, the applicant has not provided the detailed design packages required for construction. The applicable detailed design packages required by the Solid Waste Management Regulations ("Rules") and any information specifically described in the finding of facts below must be reviewed and approved by the Department prior to construction of the individual cells and any new ancillary structures for the landfill.

The Department received numerous comments from the public on the application, and on the State's transaction with GPC as a whole. Many of these comments, both in opposition to and in support of the transaction, were received on aspects of the transaction that are outside the purview of

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the Department's authority, and thus the Department cannot make findings of fact or conclusions of law on these issues. These aspects included the following issues: the legislative process, ending in the Resolve that authorized the purchase of the landfill; the RFP and bidding process that resulted in the selection of Casella as the operator of the landfill; the terms of the Purchase and Sales Agreement between GPC and the State of Maine, acting through the State Planning Office; the terms of the OSA between SPO and Casella; the establishment and duties of the Citizens Advisory Committee established by the Resolve; the host community benefits offered by SPO and/or Casella; the effect of the project on property values in the area; and the 80,000 pound weight limit on trucks using I-95, which results in heavy trucks using local roads.

The Department finds that this application for a vertical increase in the final elevation of the existing landfill is not an expansion of the landfill because solid waste will not be disposed beyond the boundaries previously licensed by the Department for solid waste disposal in the original license. The Department recognizes that under the terms of the RFP and the OSA, an application to the Department for an expansion of the landfill is required to be submitted. However, the applicant has not submitted an application for expansion or yet discussed its plans for submission of an expansion application; and thus no comments relating to development of the landfill facility beyond the vertical increase described in this application can be considered at this time.

2. PUBLIC PARTICIPATION

The Department received timely requests for a public hearing from the following 5 persons: the Town of Alton, Bruce Sidell, Oscar Emerson, William Lippincott, and the Maine Peoples Alliance. 06-096 CMR Chapter 2.7 states, in part, that "A request for a public hearing on an application must be received by the Department, in writing, no later than 20 days after the application is accepted for processing." The application was accepted for processing on November 21, 2003; thus, the 20 day period ended on December 11, 2003. On January 28, 2004, the Department notified all 5 persons that their requests did not include conflicting technical information, and thus their requests were denied because they failed to

meet the standard for a public hearing in 06-096 CMR Chapter 2.7. The Department also received a timely request from the City of Brewer that the Board of Environmental Protection assume jurisdiction of the project and hold a public hearing; the City of Brewer withdrew its request on January 28, 2004 after its concerns with the traffic impacts associated with the project were addressed.

As noted in Finding of Fact #1.C, above, many comments were received by the Department that cannot be considered because they fall outside the Department's purview.

The majority of the remaining comments from people opposed to the project focused on issues related to traffic movement, ground water quality, visual impact of the facility, odors, the types of wastes to be accepted at the facility and Casella's civil and criminal record.

The majority of the remaining comments from people supporting the project focused on it being an existing and operating, well-sited landfill, and Casella's excellent records of operating facilities in their areas. Commentors also note that area residents' concerns were addressed during the original siting and licensing of the landfill, that operation of the landfill to date has not been problematic, and that the landfill will provide needed disposal capacity for the state.

As noted in Finding of Fact #1.C, above, the Department participated in several public meetings on the project: meetings were held on December 8, 2003 and December 16, 2003 with municipal officials to discuss the traffic impacts from the project; public informational meetings were held on January 21, 2004, February 24, 2004, March 29, 2004 and March 30, 2004.

Where applicable, comments on the project that are within the Department's purview are addressed in the appropriate findings of fact, below. In addition, a written summary of comments received throughout the processing of the application is included in the record.

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3. DESCRIPTION OF SPO/CASELLA RELATIONSHIP

As described in Finding of Fact #1.B., above, the State of Maine SPO is the owner of the landfill and the applicant for this application. SPO advertised an RFP to operate the landfill. At the conclusion of that process, Casella was selected to be the long-term operator of the landfill. Actual operations will be by NEWSME Operations, a company in which a Casella subsidiary holds the sole membership interest. The terms and conditions of NEWSME Operations' operation of the landfill are established by the OSA, dated February 5, 2004, between SPO and Casella.

While SPO retains control of the landfill, in accordance with the Resolve and the OSA, Casella/NEWSME Operations will pay all costs associated with the development, operation, closure and post-closure care of the landfill. In addition, Casella/NEWSME Operations will establish and maintain financial assurance for the landfill sufficient to meet the closure and post-closure care provisions of the Rules, assume liability for the landfill under both the current (including past actions by GPC) and future conditions, and assure that adequate disposal capacity is provided for the wastes currently disposed in the landfill for a 30 year period.

Condition #6 of the order transferring the landfill licenses (DEP #S-020700-WR-M-T, dated October 21, 2003) from Fort James Operating Company to SPO requires that if Casella or a subsidiary of Casella is replaced as the operator, prior to finalization of a new OSA SPO must submit to the Department for its review and approval information on the financial capacity of the new operator, information on the financial assurance to be provided by the new operator consistent with Chapter 400.11 of the Rules or successor regulations in effect at that time, and information on the technical ability of the new operator.

The Department finds that in many instances the responsibility for submittals required by this license are placed on Casella/NEWSME Operations (or a successor operator) by the OSA. Therefore, reference to the applicant in this license refers to both SPO and Casella/NEWSME Operations (or a successor operator).

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4. FINANCIAL CAPACITY

A. Funding for development, operation, closure and post-closure care of the facility: Under the provisions of the RFP and the OSA, Casella/NEWSME Operations is required to fund future development and operation of the landfill, and closure and post-closure care of the landfill. The application includes a letter demonstrating that monies are available to fund the construction proposed for 2004; thereafter evidence of financial capacity for construction costs is proposed to be demonstrated prior to each subsequent construction activity. Funds to cover facility operations and maintenance will be generated from facility tipping fees. Financial assurance will be provided as described in Finding of Fact #4.B, below. The Department finds that the applicant has demonstrated that it has the financial capacity to undertake the proposed project consistent with the State's environmental standards and laws with regards to the construction planned for 2004 and the operation of the landfill. The Department further finds that the applicant must demonstrate financial capacity for costs associated with construction of each additional cell; the information must be included in the detailed design package as required in Finding of Fact #11, below.

B. Financial Assurance: Casella/NEWSME Operations affirmed in a letter dated October 22, 2003 that it will initially fund a closure/post-closure care account through a trust account funded by a surety bond. In accordance with Chapter 400.11 of the Rules, the financial assurance mechanism will be submitted to the Department for its review and approval; the amount of the financial assurance will be based on the costs of a third party closing any developed areas of the landfill that have not received final cover, and conducting post-closure care and maintenance of the facility for at least 30 years after closure of the facility, in accordance with the Rules. The amount of financial assurance necessary to meet these requirements, and any changes in the financial assurance mechanism, will be calculated and adjusted annually during the operational period, and reported in the annual report for the facility. The Department finds that Casella/NEWSME Operations, as the operator of the facility and as required by the OSA, will provide financial assurance sufficient to ensure

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that funds are available to pay for the anticipated costs of compliance with all facility closure, post-closure maintenance, and post-closure monitoring requirements for a period of at least 30 years after closure of the facility, provided the financial assurance package submitted to the Department for its review and approval meets requirements of the Rules and Casella/NEWSME Operations updates it in accordance with the Rules on an annual basis.

5. TECHNICAL ABILITY

A. Description of Experience: The applicant provided information demonstrating the technical ability of both SPO and the selected operator, Casella, its subsidiary NEWSME, and NEWSME Operations. The application describes SPO's experience in siting, designing and licensing the Carpenter Ridge Landfill. It also describes the solid waste expertise of Casella and its subsidiaries, and its consultants and legal counsel. The application indicates the personnel currently responsible for operations at the Pine Tree Landfill in Hampden, Maine will be responsible for fulfilling the operating services contract at this landfill; the Pine Tree Landfill is consistently operated in substantial compliance with its licenses and the Rules.

The applicant retained a number of consultants in developing the application. Sevee & Maher Engineers, Inc. ("SME"), a firm specializing in waste management issues, was the primary consultant for the project. The applicant also retained SMRT, Inc. to prepare the visual impact portion of the application; Richard E. Wardwell, P.E., Ph.D. for work on the geotechnical aspects of the application; Sanborn Head & Associates for work on the active gas management system for the landfill; Eaton Traffic Engineering to prepare the traffic assessment portion of the application; Acentech Incorporated to prepare the section of the application that addresses potential noise impacts; and Odor Science & Engineering, Inc. for work on odor control measures for the facility.

The Department finds that the combination of SPO and NEWSME Operations personnel and the consultants retained by the applicant have

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the technical ability to develop the project in a manner consistent with State standards and laws.

B. Civil/Criminal Disclosure Statement: The applicant provided civil and criminal disclosure statements prepared in accordance with Chapter 400.12 of the Rules for SPO and Casella, including its subsidiaries and the individuals required to disclose under that regulation, in the transfer application approved by the Department on October 21, 2003; the Department did not require the applicant to provide another copy of that information in this application.

The Department received comments from the public on alleged environmental violations by Casella. Department staff ("staff") requested that Casella respond to the listing of violations; Casella provided information on each of the alleged violations. Letters from municipal and county officials praising Casella's management of many of the facilities listed in the comments have been submitted. Staff also contacted environmental enforcement staff in states where the violations were alleged to occur and discussed the list provided by the public. Staff comments that based on those conversations, and the submittals from Casella and the municipal and county employees, there is no reason to withhold this license due to Casella's civil or criminal record. Staff's evaluation of the nature, substance and severity of the violations, and state and local officials' assessment of Casella's willingness to correct violations demonstrate that, where Casella is found to have violated regulatory or license criteria, it will complete any required corrective actions.

The Department finds that the applicant filed an accurate Criminal/Civil Record, prepared in accordance with Chapter 400.12 of the Rules. The Department finds that the applicant has shown that past violations of certain environmental laws, as described in the application, will not prevent SPO from owning and controlling, and NEWSME Operations from operating, the landfill as proposed in this application in compliance with Maine laws and regulations in that Casella/NEWSME Operations has conducted the required corrective actions to resolve its previous violations.

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6. TITLE, RIGHT OR INTEREST

The Department finds that the applicant has provided evidence of its interest in this project by submitting a copy of the purchase and sales agreement, dated November 20, 2003, between SPO and Fort James Operating Company. The closing on the transfer of the landfill property occurred on February 5, 2004. In accordance with Condition #2 of the transfer order (DEP #S-020700-WR-M-T, dated October 21, 2003), SPO submitted a copy of the deed to the landfill property within 30 days of its entry in the Penobscot County Registry of Deeds.

7. GEOLOGY AND HYDROGEOLOGY

A detailed description of the geology and hydrogeology of the site is contained in the original license; a summary of the siting characteristics is found in Finding of Fact #1.B, above. As confirmed during preparation of the application, the geologic and hydrogeologic characteristics of the site have not changed since the issuance of the original order and thus are not subject to the siting criteria of these Rules; however, in accordance with the Rules, the application addresses any impact the existing facility is having on water quality, affirms that groundwater flow directions and the upward seepage gradients have not changed in a significant way that would invalidate the landfill design assumptions, provides a calculation of time of travel to sensitive receptors from the bottom of the landfill and the leachate storage system, and includes a contaminant transport analysis.

A. Groundwater Flow Directions: Attachment 8 of the application includes a review of all groundwater data that has been collected at the site from 1991 when the original application was filed through September 2003. The applicant's consultant for this review, SME, reviewed the available groundwater information, and concluded that the phreatic groundwater surface has not significantly changed since the original application. Groundwater passing beneath the landfill continues to remain within the landfill property prior to discharge. Based on the orientation of bedrock foliation, it is suggested that the primary horizontal direction of groundwater flow in the bedrock is more or less the same direction as the interpreted direction of horizontal flow in the overburden. Groundwater in

the bedrock continues to be interpreted as discharging into the stream along the westerly side of the landfill, due to the presence of a topographic hill south of the stream which significantly reduces the possibility of groundwater movement beyond it. The review of the information on vertical seepage gradients indicates groundwater continues to migrate downward in the upper portions of the site and tends overall to migrate upwards in the lower portions of the site.

All staff comments on the groundwater flow information for the site have been addressed. Based on the additional information submitted in support of the application on November 21, 2003, staff agree with SME's conclusions on groundwater flow directions and vertical seepage gradients.

The Department finds that the findings in the original license regarding the direction of groundwater flow have not changed as a result of the construction and operation of the existing landfill.

B. Existing Groundwater Quality: As noted in Finding of Fact #7.A, Attachment 8 of the application includes a review of all water quality data that has been collected at the site from 1991 when the original application was filed through September 2003. The site is currently monitored by 12 groundwater monitoring wells; the results from the 12 monitoring wells were analyzed for statistically significant increases. Nine of the 12 wells were found to have one or more parameters that varied over time based on the statistical analyses; of these 9 wells, SME concluded that only one, MW-204, was potentially affected by leachate. SME concluded the changes found in the other 8 wells were caused by well installation trauma or a source other than leachate in the groundwater, based on its review of the parameters for which a statistically significant change was found. With regards to the water quality changes noted in MW-204, SME noted that the well is a shallow till well located immediately adjacent to the leachate pond and the manhole used for emptying of the leachate pond for annual inspection. SME concluded the changes in MW-204 were likely attributable to small leachate spills in the vicinity of the manhole and leachate pond during emptying of the leachate pond for annual

inspections, rather than directly into groundwater from the landfill or the leachate pond. SME's basis for its conclusions are described in detail in the application.

Staff conducted a comprehensive review of all water quality information available for the site, including the same historic water quality results compiled by GPC's water quality sampling consultant that were reviewed by SME in the application, the data gathered by the consultant GPC hired to perform a baseline analysis of conditions on the property just prior to its purchase by SPO, and data gathered from monitoring wells installed in January and February 2004 to resolve the source of changes in groundwater quality discussed during the review of the application. In an initial review memorandum dated December 16, 2003, staff noted that the water quality changes have occurred in 3 monitoring wells: MW-204, MW-223B, and MW-302. Staff agreed that the sources of changes noted in these wells could be those operational issues identified by SME in its report, but that the applicant had not provided sufficient evidence to conclude the landfill or the leachate pond were not the sources.

In response to the initial staff review memorandum, the applicant and GPC provided additional information concerning operational anomalies at the site, and 7 additional groundwater monitoring wells were installed by the applicant at the facility. Five of the wells are located between the landfill boundary and the leachate pond, and 2 of the wells are located downgradient of the leachate pond and/or in the vicinity of manhole #1. Staff oversaw the installation of the wells by the consultant, and staff took independent split samples from the wells. Up to 4 rounds of data have been collected from the new wells. Additional samples from the landfill underdrain, the leachate pond underdrain, and the leak detection system for the leachate pond were also taken during this period. Based on the information in Attachment 8 of the application and the new information gathered during review of the application, staff comment that, within the limitations of the data, a leak in the landfill liner system is not the source of the water quality changes noted in the initial staff memorandum regarding this project. Staff comment that the sources of the water quality changes are likely due to operational practices related to leachate

management, such as the small surface spills documented to have occurred in the past. Staff recommend several operational changes which will eliminate the release of leachate. The applicant has agreed to the changes. Staff further recommend that additional investigations be conducted in Spring 2004 to monitor the performance of the facility's existing detention ponds, and that the ponds be included in the surface water quality monitoring program for the facility. The applicant submitted on April 1, 2004 a workplan for the additional investigation in the areas of the detention ponds; the workplan is under review by staff. Staff comment that the approved workplan should be revised to address staff recommendations and implemented as approved.

The Department finds that the subtle changes in groundwater quality observed in monitoring wells MW-204, MW-223B and MW-302 do not appear to be caused by leakage through the landfill liner system. The Department also finds that the applicant must submit to the Department for review and approval changes to the operations manual that address all staff recommendations; complete the investigation in the areas around and beneath detention ponds 1 and 2 in accordance with the workplan approved by the Department; and include the ponds in the surface water quality monitoring program for the facility. The Department further finds that the facility is not contaminating groundwater in that no primary drinking water standards have been exceeded, and no statistically significant changes in measured parameters indicating a deterioration in water quality have been demonstrated through an assessment monitoring program.

The Department received many comments from the public in reaction to staff's initial memorandum regarding the water quality assessment; no independent information on water quality was submitted by the public. The Department finds that, as noted in this finding, the comments on existing water quality have been addressed by the additional information gathered during the review process. The Department also received comments from the public on the hydrologic connection between the landfill and the City of Old Town's drinking water supply. As described in Finding of Fact #1.B, above, the facility is hydraulically isolated from

private drinking water supplies in the area of the landfill. The City of Old Town's public drinking water supply is wells located in Stillwater and along Spring Street; there is no direct hydraulic connection between these wells and the groundwater beneath the landfill. The Department finds that the landfill does not pose an unreasonable threat to the public drinking water supply.

C. Existing Surface Water Quality: Attachment 8 also includes a review of the surface water quality data that has been collected at the site from 1991 when the original application was filed through September 2003. There are 3 surface water monitoring points (SW-1, SW-2 and SW-3) along the unnamed stream on the westerly boundary of the facility. The report notes that there were no apparent or significant changes in water quality at these locations. This stream is the sensitive receptor for the landfill; see Finding of Fact #7.D, below. Although labeled as a surface water monitoring location, SW-4 is actually the sampling manhole for the cells 1 and 2 underdrains; the report notes that the data from this monitoring point is comparable to upgradient monitoring locations. There are 3 surface water monitoring points along the entrance road into the landfill (SW-AR1, SW-AR2 and SW-AR3); the results from these locations also show no changes in water quality data over time. Staff concur with the applicant's conclusions regarding the historical surface water quality monitoring results.

The Department received comments from the public that baseline testing for biological indicators of water quality should be done at the site.

The Department finds that the facility is not contaminating surface water. The Department further finds that baseline surface water quality was established in accordance with the Rules before the landfill was developed and that the Rules do not include provisions for biological indicators testing.

D. Updated Time of Travel Calculations and Contaminant Transport Analysis: Updated time of travel calculations for the landfill prepared in accordance with the Rules are found in Section 7 of the application. Using

available water level information collected at the site since 1991, the applicant calculated groundwater time-of-travel from the bottom of the landfill liner systems to the sensitive receptor for the site – the unnamed stream along the westerly boundary. The updated contaminant transport analysis, also prepared in accordance with the Rules, assesses the potential for an unreasonable threat to the unnamed stream at the westerly boundary of the landfill, and identifies operational and monitoring measures that would be utilized to ensure protection of the stream if contaminants were released to groundwater beyond the engineered systems.

The report modeled contaminant transport from within 3 areas of the landfill, the leachate storage tank, and the leachate force main in hypothetical failure scenarios. The results demonstrate that even under the unrealistic failure scenarios required to be modeled, the sensitive receptor in the vicinity of the landfill will not be threatened.

In response to initial staff comments on the time-of-travel calculations and contaminant transport analysis, SME recalculated some of the travel time analyses and hypothetical leachate containment system failure analyses for the entire flow path to the unnamed stream to the west, using the groundwater velocities in the bedrock submitted in the original application. Staff comment that the revised calculations show that the regulatory time frames are met.

The Department received comments from the public that the bedrock underneath the landfill is "cracked". The Department finds that the entire State of Maine is underlain by fractured bedrock. The Rules require a detailed evaluation of underlying fractured bedrock aquifers to determine that a facility will not pose an unreasonable threat to an underlying fractured bedrock aquifer.

The Department finds that the applicant has demonstrated that the time of travel to the sensitive receptor for the landfill is greater than 6 years, and greater than 3 years for the proposed leachate force main and storage tank. The Department also finds that the contaminant transport analysis demonstrates that contaminant releases from the area within the solid

waste boundary or the leachate management system will not pose an unreasonable threat to sensitive receptors.

8. WATER QUALITY MONITORING

The proposed environmental monitoring plan ("EMP") for the facility was prepared in accordance with the Rules and is found in Appendix H of the application. The applicant proposes to continue monitoring groundwater at the existing 12 monitoring wells, surface water at the existing 6 monitoring points, the underdrains for the landfill and the leachate pond at the existing 2 surface water points, and leachate quality. Monitoring will be done 3 times per year, using low flow methodology. The applicant proposed to continue monitoring for the existing detection monitoring list for the landfill, plus sulfide during the spring and fall sampling events, and for parameters on the expanded list for the landfill during the summer sampling event. The EMP describes the sampling procedures to be used, the quality assurance/quality control program, the submission of the data to the Department, and procedures for the abandonment of wells.

Staff proposed several revisions to the EMP to clarify that the EMP will require ongoing revisions as the facility is developed. Although the results from the new groundwater monitoring wells described in Finding of Fact #7.B, above, appear to corroborate the applicant's conclusions as to the source of the slight changes in existing water quality, staff recommend that assessment monitoring be initiated at monitoring wells MW-204, MW-302, MW-223B, MW-212 and MW-303 during the Spring 2004 sampling event and that new monitoring locations in the area of the detention ponds be added to the assessment monitoring program after their installation. Staff further recommend that the 3 new clusters of monitoring wells proposed in the application be installed in Spring 2004, and that new monitoring wells #DP-4, #P-04-02 and #P-04-04 and the 2 existing detention ponds be included in the detection monitoring program. Staff further recommend that the underdrain for the landfill be added to the EMP for the facility; all landfill underdrain discharge locations should be monitored monthly for the field parameters in Appendix A, Column 1 of Chapter 405 of the Rules, and be sampled 3 times per year for the facility's suite of detection parameters at the same time as the other monitoring locations.

Staff also comment that the existing underdrains for the landfill and the leachate pond are directed through manholes where water quality monitoring can be conducted. The system allows for the removal of the water into the leachate containment system instead of discharge into the stormwater structures if the water quality results indicate it should not be discharged. Staff recommended, based on investigations done in January and February 2004 that the underdrain for the leachate pond be routed into the leachate pond. A pump has been installed in manhole #MH 7 and this underdrain discharge is being directed to the leachate pond. Staff also recommend that the underdrain for the existing leachate pond be sampled weekly throughout 2004, and an analysis of the results be included in the 2004 annual report for the facility.

The Department finds that the applicant has proposed an EMP prepared in accordance with the Rules. The Department further finds that the applicant must update the EMP on an ongoing basis as recommended by staff, beginning with the submittal of the 2003 Annual Report. The Department also finds that assessment monitoring must be initiated at existing monitoring wells MW-204, MW-302, MW-223B, MW-212 and MW-303 during the Spring 2004 sampling event; that the new monitoring locations in the area of the detention ponds be included in the assessment monitoring program beginning with the Summer 2004 sampling event; and that the new monitoring wells #DP-4, #P-04-02 and #P-04-04 and the 2 existing detention ponds must be included in the detection monitoring program in addition to the 3 new clusters of monitoring wells proposed in the application to be installed in Spring 2004. The Department also finds that the underdrain for the landfill must be added to the EMP for the facility; all landfill underdrain discharge locations must be monitored monthly for the field parameters in Appendix A, Column 1 of Chapter 405 of the Rules, and be sampled 3 times per year for the facility's suite of detection parameters at the same time as the other monitoring locations. The Department also finds that the underdrain for the leachate pond has been routed into the leachate pond, and that the leachate pond underdrain water quality must be sampled weekly throughout the rest of 2004 and an analysis of the results be included in the 2004 annual report for the facility. The Department also finds that the proposed construction at the facility will not affect the ability to monitor water quality at the facility site.

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9. LANDFILL DESIGN

A. Summary of Current Design: The design of the facility is described in the original license and the construction documentation for cells 1 and 2. Cells 1 and 2 of the landfill have been developed; a temporary geomembrane intermediate cover has been placed on cell 1 and cell 2 is currently operational. The approved composite liner system for these cells consists of, from top to bottom, a 15-inch drainage sand leachate collection system with perforated collection pipes (underlain by a drainage geocomposite in cell 2); an 80-mil textured high-density polyethylene ("HDPE") geomembrane; a geosynthetic clay liner ("GCL"), and 24 inches of recompacted glacial till with a maximum hydraulic conductivity of $3x10^{-6}$ cm/sec. A groundwater underdrain system consisting of a 6-ounce non-woven geotextile, 12 inches of drainage sand with collection pipes, and another 6-ounce non-woven geotextile underlies most areas under these cells. Leachate is conveyed by gravity to a leachate storage pond located outside the western boundary of the landfill. Leachate is transported from the pond via a force main to a loading rack where it is loaded into tank trucks for transport and subsequent treatment and disposal at the Old Town Mill's wastewater treatment facility. The pond has a double liner system, consisting of two 80 mil HDPE geomembranes, with a drainage geocomposite and sand leak detection layer in between. The secondary geomembrane is underlain by a GCL and 2 feet of recompacted glacial till with a maximum hydraulic conductivity of $3x10^{-6}$ cm/sec. Landfill gas is passively vented to the atmosphere.

B. General Description of Proposed Design: As noted above, cells 1 and 2 have already been developed. The waste currently in these cells will be excavated and mixed with incoming waste to improve the geotechnical stability characteristics of the existing sludge (see Finding of Fact #10.A, below) and then cells 1 and 2 will be refilled. The leachate collection, liner, and underdrain system for cells 1 and 2 will continue in service. Cells 3 through 8 will be located on the base grade for the landfill, and cells 9, 10 and 11 will be developed over cells 1 through 8. To accommodate the proposed vertical increase in the final elevation, a berm

will be constructed around the perimeter of the landfill as it is developed. The berm will be constructed entirely of soil, except for the western portion of the berm which is proposed to have mechanically stabilized exterior grades. The landfill will be developed in a sequential manner as shown on the cell development plan for the facility.

All base grade cells will include a liner system overlain by a leachate collection system. The original liner system has been modified through the use of compacted clay rather than compacted glacial till for the soil component of the composite liner system. Instead of the pipe liner penetrations currently used to convey leachate from cells 1 and 2 (which will be removed and repaired as part of cell 4 construction), cells 3 through 8 will have leachate collection sumps and pumps located above the liner system. A groundwater underdrain system will underlie the liner system for cells 3 through 8. Gas produced by the landfill will be burned off initially through the use of passive flares. When the gas produced is of sufficient quantity and quality to support combustion, an active gas extraction system will be installed as described in Finding of Fact #9.E. The cells will be developed sequentially, and intermediate or final cover will be placed as the cells are filled. The leachate from the landfill will be conveyed through a force main to a new above-ground storage tank with the existing leachate pond used only as a backup system. The stored leachate will be emptied into tank trucks for transport to the Old Town Mill's wastewater treatment plant. In the future, the leachate may be transported to the City of Old Town's wastewater treatment plant via a new sewer line along Route 43, after studies of the treatment plant, and any necessary upgrades identified in the studies, are completed and if the City of Old town approves the acceptance of the leachate. As described more fully in this finding and in Finding of Fact #11, below, detailed design packages will be submitted to the Department for review and approval prior to each construction project at the facility.

The Department received comments from the public regarding bioreactor (wet cell) landfills. Commentors suggested that the Department require that landfill cells constructed under this license utilize wet cell technology. The Department finds that the applicant did not propose and the Rules do

not require an applicant to consider the use of wet cell technology. Furthermore, the United States Environmental Protection Agency published a Final Rule in the Federal Register on March 22, 2004 entitled Research, Development, and Demonstration Rule (RD&D) for municipal solid waste landfills. The effective date of this rule is April 21, 2004. This rule addresses design and operational criteria variances that are necessary in order to develop information on bioreactor landfills. The applicant has provided correspondence dated April 5, 2004 documenting its willingness to explore the feasibility of wet cell or bioreactor technology.

C. Liner System and Perimeter Berm: The liner system proposed for the base grade cells of the landfill will consist of, from top to bottom: a leachate collection layer consisting of 12 inches of drainage sand with perforated HDPE collection pipes over a drainage geocomposite; an 80-mil HDPE textured geomembrane; a GCL; and one foot of compacted clay with a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec. The liner system will be underlain by an additional foot of compacted clay with a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec. Three internal leachate sumps will be constructed to collect all leachate generated by both the existing and new cells. The existing leachate transport pipes that penetrate the liner system to convey leachate to the storage pond will be removed and the liner repaired and tested. The landfill liner will be underlain by a groundwater underdrain system consisting of twelve inches of sand with perforated HDPE collection pipes. The underdrain system is designed with groundwater quality monitoring sumps.

As noted previously, a berm is proposed to be constructed around the perimeter of the landfill. The berm is required to achieve the increase in the final elevation of the landfill. It will be constructed entirely of soil, except for the western portion where it is proposed to have mechanically stabilized exterior grades due to wetland setback limitations. The interior of the berm will have 3 horizontal to 1 vertical sideslopes. The exterior sideslopes where the berm will be constructed entirely of soil will have 2 horizontal to 1 vertical grades. The mechanically stabilized earthen ("MSE") portions of the berm will have 1 horizontal to 3 vertical

sideslopes. The height of the berm will vary from 19 feet along the western side to 30 feet along the eastern side of the landfill. The top surface of the berm will be approximately 44 feet wide. A 20-foot wide access road, surface water drainage ditches and the valve houses for the leachate pumping stations will be located on the top of the berm. The berm will be constructed in phases concurrent with cell development. Geotechnical analyses of the berm, for both short- and long-term conditions, demonstrate that it will remain stable with the appropriate factors of safety; see Finding of Fact #10.C, below.

Staff comment that all issues raised in initial review memoranda regarding the liner system and the perimeter berm have been satisfactorily resolved, provided that the detailed design packages to be submitted prior to each construction project address all staff recommendations regarding the design, the technical specifications, and the construction quality assurance plan as agreed to in SME's January 22, 2004 responses to the comments provided in 3 initial engineering review memoranda by staff.

The Department finds that the liner system and the perimeter berm proposed by the applicant are designed in accordance with the Rules, provided that the detailed design packages to be submitted to the Department for review and approval prior to each construction project address all staff recommendations on the design, the technical specifications, and the construction quality assurance plan as agreed to in SME's January 22, 2004 responses to the comments provided in 3 initial engineering review memoranda by staff.

D. Leachate Collection, Conveyance and Storage System: The leachate collection system for the base grade cells will consist of a 12-inch layer of drainage sand (drainage stone on the top 10 feet of the sideslopes) with perforated leachate collection pipes, a drainage geocomposite, several leachate collection inlets, and tee connections on the leachate collection system cleanouts. The inlets and tee connections will help facilitate leachate drainage during operations, including the development of upper lifts. Pressure transducers will be placed within each base grade cell in order to monitor the performance of the leachate collection system.

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Leachate will be collected within the perforated pipes, directed to sumps, and pumped through a double-walled force main to an above ground storage tank. The existing leachate storage pond will be used for back-up storage capacity with the leachate flows pumped directly to it if the leachate storage tank is full.

The applicant proposes to construct a new 81-foot diameter by 25-foot high above-ground tank with a capacity of 900,000 gallons for the storage of leachate generated by the landfill. The tank will be underlain by a leak detection system and a secure secondary containment structure sized to contain 110 percent of the maximum tank storage capacity. An assessment of the quantity of leachate anticipated to be generated by the landfill was completed. Based on a comparison with data from another facility, SME concluded that the modeling parameters used to estimate leachate provided a good representation of actual leachate generation rates. The anticipated leachate production rates during the period identified as having the highest leachate volume were used to size the leachate collection, conveyance and storage structures. From the storage tank, leachate will be loaded into tank trucks and transported to the Old Town Mill's wastewater treatment facility.

Staff comment that all issues raised in initial engineering review memoranda regarding the leachate collection, conveyance and storage systems have been satisfactorily resolved, provided the detailed design packages submitted to the Department for review and approval prior to each construction project address all staff recommendations regarding the design, the technical specifications, and the construction quality assurance plan as agreed to in SME's January 22, 2004 responses to the comments provided in 3 initial engineering review memoranda by staff.

The Department finds that the applicant has proposed leachate collection, conveyance and storage systems designed in accordance with the Rules, provided that the detailed design packages to be submitted to the Department for review and approval prior to each construction project address all staff recommendations regarding the design, the technical

specifications, and the construction quality assurance plan as agreed to in SME's January 22, 2004 responses to the comments provided in 3 initial engineering review memoranda by staff.

E. Gas Management System: The applicant proposes to install an active gas extraction system within the landfill. The primary purpose of the system is to control emissions of landfill gas from the landfill to provide compliance with current Title V New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements. A secondary benefit of the system is the control of potential landfill odors. The system will be installed sequentially during site development.

The active gas extraction system will consist of vertical gas extraction wells, and may be supplemented by horizontal collector pipes as needed, along with the associated header and lateral piping to transport the gas to a blower and flare station. The blower and flare station will be constructed near the area where the leachate storage tank is proposed to be located. Condensate from the gas management system will be pumped directly into the leachate management system, both at the cell 4/5 leachate collection sump and the leachate storage tank.

Staff comment that the active gas extraction system was sized, and the installation timing of the components proposed, in part, on the projected disposal rates in the application. To ensure the effectiveness of the active gas extraction system, staff comment that each year's annual report should include an evaluation of the of the sizing and the installation timing of the system components over the reporting period, and an evaluation of the effectiveness of the system based on the quantities and types of wastes projected for the next year.

In response to staff comments, the applicant has committed to an accelerated schedule for installation of the active gas extraction system. During initial operations in cell 3, the applicant proposes to install passive flares. The location and number of passive flares will be included in the detailed design package for cell 3 submitted to the Department for review

and approval. The applicant proposes to monitor the passive flare locations for gas flow rate, and concentrations of methane, carbon dioxide, and oxygen. Once the monitoring data shows that the gas is of a sufficient quality and quantity to support combustion with an active gas management system, the applicant will finalize the design of the active gas management system, including a schedule for installation of the system. Furthermore, the applicant proposes to install gas collection infrastructure to provide the ability to collect gas generated from solid waste in place for 12 months or longer through either vertical extraction wells or horizontal collectors, or a combination thereof.

The applicant will install temporary connections to the active gas management system components at the time of construction if the necessary infrastructure is not in place to accommodate the planned permanent connections. The applicant also proposes to use a portable blower and flare unit if the permanent blower and flare station has not been constructed at the time it is initially needed.

In response to staff comments regarding access to the well-heads on areas that have received intermediate cover, the applicant stated that soil intermediate cover will be utilized as the primary option. This will allow operating personnel to have safe access to the well-heads to monitor and balance the well-field. The applicant further stated that temporary geomembrane tarps will be a secondary option, and acknowledged that protection of the well-heads and safe access provisions, particularly during the winter months, will be necessary if temporary geomembrane tarps are utilized. Staff comment that well-head protection and access provisions need to be submitted to the Department if temporary geomembrane tarps are utilized for intermediate cover.

The applicant proposes to submit the operating plan for the gas management system with the appropriate annual report. Staff comment that the operational procedures for the gas management system, inclusive of monitoring, record-keeping, and reporting procedures for both the well-field, and the blower and flare unit, should be submitted with the detailed design package for construction of the system.

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The Department finds that the applicant has demonstrated that the active gas extraction system proposed for phased construction in the landfill is designed to reduce fugitive emissions of landfill gas and control odors associated with the landfill, provided the detailed design package to be submitted to the Department for review and approval prior to each phase of construction addresses staff recommendations regarding the design, the technical specifications, and the construction quality assurance plan as agreed to in Sanborn Head & Associates' ("SHA") submittal dated January 21, 2004 and the applicant's letter dated February 4, 2004, provided the active gas system operating plan, inclusive of monitoring, record-keeping and reporting procedures, is submitted for review and approval with the detailed design packages; provided that each year's annual report includes an evaluation of the of the sizing and the installation timing of the active gas system components over the reporting period, and an evaluation of the effectiveness of the system based on the quantities and types of wastes projected for the next year; and provided plans are submitted to the Department for review and approval detailing the provisions to be utilized to protect the well-heads and provide safe access to the well-heads if temporary geomembrane tarps are utilized for intermediate cover.

F. Closure Design: The applicant proposes to construct a phased final cover system throughout the operational life of the landfill as areas of the landfill with no plans for future waste placement are filled to final grade. The proposed cover system will meet the applicable requirements of the Rules for a secure landfill that govern at the time of closure. Prior to the placement of final cover on any area, the applicant will submit the detailed design package and supporting information on the design required by the applicable requirements in Chapter 401.5 of the Rules to the Department for review and approval. The Department finds that the applicant has proposed to apply a phased final cover system in accordance with the Rules, provided the detailed design packages for the placement of phased final cover are reviewed and approved by the Department prior to each application of final cover. The Department further finds that the applicant must submit to the Department for its review and approval a final closure

plan for the landfill, prepared in accordance with the Rules in effect at that time, and complete final closure of the landfill in accordance with the approved final closure plan. As required by the Rules, the final closure plan must include a post-closure monitoring and maintenance plan covering a period of at least 30 years following closure. The Department also finds that the post-closure monitoring and maintenance plan must be revised throughout the post-closure period to comply with any changes in the post-closure monitoring and maintenance requirements of the Rules. The Department further finds that post-closure monitoring and maintenance requirements do not automatically cease after 30 years; they must continue to be met until the Department approves their cessation.

10. SETTLEMENT AND GEOTECHNICAL STABILITY

A. Test Plot Program: GPC has been conducting a pilot project at the existing landfill since October 1999. The purpose of the project is to evaluate the short-term stability of the sludge in the field, and to evaluate operational issues associated with the initial loss of shear strength in the sludge. The consultant for the pilot project is Richard E. Wardwell, P.E., Ph.D. ("REW"). The applicant retained REW to evaluate the settlement and stability aspects of this application in part because of his working knowledge of the characteristics of the sludge already disposed in cells 1 and 2 of the landfill. Based on the Department's recommendations, due to geotechnical stability concerns, the applicant proposed to remove the existing sludge and mix it with other incoming wastes (including new sludge from the Old Town Mill) in order to improve its geotechnical characteristics.

Originally the applicant proposed to mix no more than 15% of the existing and new sludge by volume into the incoming waste. Stability of the waste at this percentage would meet the regulatory criteria, but it was predicted to take several years to complete the mixing process and require a large operating area. The large operating area would result in greater leachate production and an increase in potential odor generation. The applicant now proposes to determine the optimum ratio at which the existing sludge can be mixed with the incoming waste and still achieve deposit stability by

constructing an initial test plot in the existing, unused area of cell 2. The test plot construction is expected to take at least 6 weeks to complete, and will require a total of approximately 98,000 cubic yards of waste. Of this amount, approximately 60% of the waste will be diverted from the Pine Tree Landfill in Hampden and the remaining 40% will be existing and new sludge. It is important for the test plot program to operate through the spring thaw period because this has been observed to be the most biologically and chemically active time in the existing sludge. As a result, the amount of waste delivered to the landfill for mixing with the sludge will exceed the projected rate of filling at the landfill for this time period.

The test plot is proposed to consist of 3 sections; in each of the 3 sections the existing sludge will be mixed with incoming waste at different ratios (20%, 40% and 60% sludge to other wastes). The test plot has been designed to mimic actual operating conditions and will provide necessary information on the operating criteria that will be used to effectively run the landfill. In addition to gathering data for the stability evaluation through instruments installed in the test plot, air monitoring (oxygen, methane, and hydrogen sulfide) will be conducted. Based on the findings of the test plot program, the need to re-assess geotechnical stability will be evaluated, a finalized geotechnical monitoring plan for the facility will be prepared, the operating requirements for cell 3 will be finalized, and an odor control plan for sludge excavation and mixing will be prepared. All of the above will be submitted to the Department for review and approval.

The Department finds that the use of the proposed test plot program to determine the optimum rate at which the existing sludge can be excavated and mixed with incoming waste will result in a stable landfill configuration provided operations are conducted in accordance with approved recommendations from the program. The Department further finds that it is acceptable for the applicant to divert the necessary quantity of any waste delivered to PTL to the WOTL for use in the test plot within the time frame needed for completion, as outlined in the description of the test plot program proposal.

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B. Settlement Analysis: Short and long-term settlement was analyzed to assure that load and non-load related strains associated with primary compression and waste decomposition will not be detrimental to the performance of the proposed liner, leachate collection, underdrain, and final cover system. Liner, leachate collection, and underdrain system settlement was evaluated considering the elastic deformation of the subgrade soils. Cover system settlement was estimated from the projected secondary compression of the mixed solid waste using coefficients that have been observed for similar waste streams at a similar facility. The Department finds that the applicant demonstrated that the landfill liner, leachate collection, underdrain, and final cover systems will maintain their integrity and performance at the maximum predicted settlements.

C. Geotechnical Stability Analysis: Geotechnical stability analyses for the proposed vertical increase at the landfill were completed in accordance with the Rules. The stability assessment analyzed potential failure planes through the foundation soils and along liner and cover system interfaces. The minimum required factors of safety were achieved for all identified critical failure planes. The need to re-assess geotechnical stability will be evaluated once the findings of the test plot program described in Finding of Fact #10.A, above, are available. Stability of the MSE berm was also evaluated and the minimum required factors of safety were achieved. The Department finds that the applicant has demonstrated that the landfill, including the MSE berm, will meet or exceed the minimum required factors of safety during construction, operation and the post-closure periods under both static and seismic conditions, provided an appropriate ratio of sludge to other incoming waste is chosen and approved by the Department through an evaluation of the findings of the test plot program.

D. Settlement and Stability Monitoring Plan: After completion of the test plot program described in Finding of Fact #10.A, above, the applicant will prepare and submit to the Department for review and approval a proposed geotechnical monitoring plan that will include the proposed waste mixing procedures for cells 1, 2 and 3 as well as routine operational stability monitoring. The applicant also proposes periodic settlement monitoring of completed cells to determine site specific compression coefficients, and

monitoring and observations of the final cover system, to confirm that total and differential strains are within tolerable limits. The Department finds that the applicant has proposed to provide a plan to monitor stability and settlement during construction, operational and post-closure periods, and report the results to the Department, including an interpretation of the results by a qualified geotechnical engineer. The Department also finds that the applicant proposes to prepare and submit the geotechnical monitoring plan for the landfill to the Department for review and approval once the findings of the test plot program have been evaluated.

11. CONSTRUCTION

The landfill, and some of the proposed ancillary structures, will be constructed over time, as capacity is needed. New cells will be constructed by a general contractor who can demonstrate familiarity and experience with the various aspects of landfill construction, and by subcontractors with specialized experience in the installation of geosynthetics.

The applicant has prepared a preliminary construction quality assurance ("CQA") plan that establishes the requirements for CQA testing and installation oversight of all construction materials to assure that the design specifications and performance requirements are achieved during construction. Geosynthetics and soil components will be tested, certified, and inspected by qualified CQA personnel independent of SPO, NEWSME Operations and any contractor hired for the project.

CQA personnel will provide on-going, thorough project documentation during construction. Daily and weekly reports will be prepared and provided to the Department. A final construction report will be prepared and submitted for Department review and approval within 45 days of the conclusion of each construction project.

Following installation of the leachate collection system, the applicant proposes to conduct an electric leak location survey of the geomembrane liner to assure that it was not damaged during overburden placement. Electric leak location is an innovative quality assurance technology developed to detect any breaches in the

geomembrane after placement of the protective layer (once the greatest potential for damage to the geomembrane has passed). It is accomplished by impressing a voltage across the geomembrane then scanning the surface for current flow. The geomembrane is an insulator and will not allow current to pass through it unless a hole is present. If a hole is found, it will be exposed, repaired, and retested before the liner system is placed into service.

The applicant has prepared preliminary construction contract documents as part of the application. Prior to construction of each cell, the applicant will provide the Department for review and approval a detailed design package which will include design details and calculations, a complete set of project specific construction contract bid documents, including drawings, technical specifications, contract administrative documents, and the construction quality assurance plan for that project.

The applicant proposes to initiate construction of the test plot program described in Finding of Fact #10.A, above, shortly after approval of this application is received. The test plot construction is anticipated to take at least 6 weeks to complete. The findings of the test plot program will then be used to evaluate the need for additional geotechnical stability analyses, to finalize the operating requirements for cells 1, 2 and 3, to finalize a geotechnical monitoring plan for the facility, and to develop an odor control plan for sludge excavation and mixing operations. Staff comment that all recommendations regarding the construction, operation, and monitoring of the test plot have been adequately addressed, provided the work is completed as described in REW's work plan as revised in REW's submittal dated January 16, 2004.

The detailed design package for cell 3, and the new leachate storage tank and ancillary structures, are expected to be submitted to the Department for review and approval in Spring 2004. It will include the technical specifications, construction drawings, construction quality assurance plans, and construction monitoring and documentation provisions required by the Rules. It will include all information recommended by staff during review of the application, as agreed to in SME's submittal dated January 22, 2004 and as responded to in staff memoranda dated January 26, 28, and 30, 2004.

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Construction of cells 4 through 11, inclusive of the leachate management system for the cells, is expected to proceed sequentially. The applicant proposes to submit to the Department for review and approval the detailed design package for each of these cells at least 6 months prior to the date planned for initiation of operation. Each detailed design package will include the technical specifications, construction drawings, a construction quality assurance plan, and the construction monitoring and documentation provisions required by the Rules. Each detailed design package will include all information recommended by staff during review of the application as agreed to in SME's submittal dated January 22, 2004 and as responded to in staff memoranda dated January 26, 28 and 30, 2004. Staff further comment that, if the Rules applicable to any aspect of construction of the landfill cells change during the development of the landfill, the applicant should be required to address the new design requirements in the subsequent detailed design submittals.

Construction of the perimeter berm, including the MSE berm, is expected to proceed sequentially as the landfill cells are developed. A detailed design for the construction of the perimeter berm in the area of cell construction will be included in the detailed design package submitted for construction of the individual cells. Staff comment that all issues identified in the review of the application have been satisfactorily addressed, provided all recommendations in staff memoranda are addressed as agreed to in SME's submittal dated January 22, 2004 and as responded to in staff memoranda dated January 26, 28 and 30, 2004. Staff further comment that, if the Rules applicable to any aspect of construction of the perimeter berm change during the development of the landfill, the applicant should be required to address the new design requirements in the subsequent detailed design packages.

Construction of the active gas extraction system is expected to occur on an annual basis. The details for the following year's installation are proposed to be described in the annual report for the facility, and in detailed design packages provided to the Department for review and approval prior to construction. Staff comment that all issues identified in the review of the application have been satisfactorily addressed, provided all recommendations in the staff memoranda are addressed as agreed to in SHA's submittal dated January 21, 2004 and the applicant's letter dated February 4, 2004, provided the active gas system

operating and monitoring plans are submitted with the detailed design package, and provided plans are submitted detailing the provisions to be utilized to protect the well-heads and provide safe access to the well-heads if temporary geomembrane is utilized as intermediate cover. Staff further comment that, if the Rules applicable to any aspect of construction of the active gas extraction system change during the development of the landfill, the applicant should be required to address the new design requirements in the subsequent detailed design packages.

Construction of the phased final cover will occur as areas of the landfill are filled to the proposed final grade. Prior to the placement of final cover on any area, the applicant will submit to the Department for review and approval a detailed design package to include the detailed construction plans, technical specifications, a construction quality assurance plan, and supporting information on the design as required by the applicable provisions of Chapter 401.5 of the Rules. Staff comment that all issues identified in the review of the application have been satisfactorily addressed, provided all recommendations in staff memoranda are addressed as agreed to in SME's submittal dated January 22, 2004 and as responded to in staff memoranda dated January 26, 28 and 30, 2004. Staff further comment that, if the Rules applicable to any aspect of the placement of phased final cover change during the development of the landfill, the applicant should be required to address the new closure requirements in the subsequent phased final cover submittals. Staff comment that the applicant must also submit to the Department for its review and approval a final closure plan for the landfill, prepared in accordance with the Rules in effect at that time, and complete final closure of the landfill in accordance with the approved final closure plan. As required by the Rules, the final closure plan should include a post-closure monitoring and maintenance plan covering a period of at least 30 years following closure. The post-closure monitoring and maintenance plan should be revised throughout the post-closure period to comply with any changes in the post-closure monitoring and maintenance requirements of the Rules.

The Department finds that the applicant has addressed all aspects of the construction and closure of the proposed vertical increase of the landfill, provided detailed design packages are submitted to the Department for review and approval prior to the initiation of any construction project, and provided the various ongoing construction activities described in this finding are designed, constructed,

monitored, operated, closed, and monitored and maintained during the post-closure period in accordance with the application, staff recommendations on the application and responses to staff recommendations submitted by the applicant and its consultants in submittals dated January 16, 2004; January 21, 2004; January 22, 2004; and February 4, 2004. The Department also finds that, as recommended in Finding of Fact #4.A, above, the applicant must include a demonstration of financial capacity for costs associated with construction of cells 4 through 11 as part of the detailed design packages for these cells. The Department further finds that, if the Rules applicable to any aspect of construction or post-closure care of the vertical increase of the landfill and its ancillary structures change during the development of the landfill, the applicant must address the new requirements in subsequent submittals.

12. OPERATIONS

The applicant proposes to continue using the current operations manual for the landfill until the completion of construction of cell 3. The current operations manual for the facility includes the detailed operating requirements specific to the GPC waste characteristics and generation rates. Until the time cell 3 is available for disposal, only the wastes currently approved for disposal will be landfilled, except during the construction of the test plot program described in Finding of Fact #10.A, above. Operational criteria specific to the test plot program have been reviewed and found to be acceptable by staff.

The applicant proposes to update the operations manual to reflect the proposed waste characteristics, generation rates, mixing requirements, and cell development sequence and provide it to the Department for review and approval prior to the commencement of waste placement in cell 3. A conceptual cell development plan for the proposed life of the landfill was included in the application; staff comment that all recommendations regarding the conceptual cell development plan have been adequately addressed provided the plan is revised as described in SME's January 22, 2004 submittal. The applicant proposes to provide a detailed cell development plan, covering the first 2 years of operations, for the landfill prior to the commencement of filling in cell 3, and provide it to the Department for review and approval. As required by the Rules, proposed revisions to the operations manual, including the annually updated cell development plan, will be included in

the facility's annual report, and the operations manual will be revised to comply with any changes in the operating requirements in the Rules. The operations manual will again be updated and submitted to the Department for review and approval following completion of the test plot program and prior to the excavation of sludge from cells 1 and 2.

The hours of operation for the landfill are proposed to be 6 AM to 8 PM on weekdays and 8 AM to 4 PM on weekends, although Casella's contract with PERC requires that the landfill be available for disposal of its residues outside the normal business hours. The operations manual for the facility addresses basic functions such as the maintenance of the access road, and includes the many plans and provisions for the orderly operation of the landfill addressed throughout this order.

The Department finds that the operations manual was prepared in substantial accordance with the Rules, and that it provides the information necessary to enable supervisory and operating personnel, and persons evaluating the operation of the landfill, to determine the sequence of operation, policies and procedures for the landfill, as well as the monitoring, maintenance, inspection and legal requirements that must be met for the operation of the landfill on an ongoing basis, provided the operations manual is revised prior to the commencement of waste placement in cell 3 and as recommended by staff. The revisions to the operations manual must include the following information: the conceptual and detailed cell development plans;, and changes made to address staff recommendations as agreed to in SME's January 22, 2004 submittal addressing staff memoranda. The operations manual must be updated again to incorporate changes needed to address the findings of the test plot program. All changes to the operations manual are to be submitted to the Department for review and approval, and implemented as approved by the Department.

13. ACCEPTABLE WASTES

A. Waste Types and Sources: The landfill is currently licensed to accept pulp and paper mill wastewater treatment plant sludge from the Old Town Mill, smaller quantities of other special wastes from the Old Town Mill (lime wastes and grit, woodwaste and inert debris, soil and sawdust

contaminated with non-hazardous process chemicals, virgin oily contaminated debris, sand from sandfilters, and non-hazardous sandblast grit), flyash from Lincoln Pulp and Paper, and burn pile ash from the City of Old Town's transfer station.

This application proposes to add the solid wastes approved for disposal at Pine Tree Landfill in Hampden that are generated in Maine, including solid waste from all 4 licensed incinerators, to the list of wastes acceptable for disposal in the landfill. The wastes proposed to be added would consist primarily of front-end process residue ("FEPR") from PERC in Orrington, Maine and Maine Energy in Biddeford, Maine; oversized bulky wastes; MSW bypassed from incinerators located in Maine; construction and demolition debris; ash from incinerators located in Maine; and water/wastewater treatment sludge. Small quantities of other miscellaneous non-hazardous waste streams are also listed in the application for disposal in the landfill. There are 34 wastes listed in the miscellaneous category; in total, they are anticipated to equal approximately 50,000 tons per year. In addition, Appendix K of the application includes a listing of the generator, type of solid waste and permit number of several individually permitted wastes currently approved at Pine Tree Landfill that the applicant proposes to accept at WOTL. The yearly quantity of solid waste to be accepted at the landfill is not expected to exceed 540,000 tons per year.

The applicant has committed to the same limitations on MSW accepted for disposal at WOTL as at Pine Tree Landfill. Department License #S-001987-WD-QA-M, issued to Pine Tree Landfill on February 26, 2002, limits the MSW Pine Tree Landfill is allowed to accept to unprocessed MSW bypass from the following sources: the PERC incinerator in Orrington and the Maine Energy incinerator in Biddeford; waste delivered under an interruptible contract with PERC; or waste delivered in excess of processing capacity at other MSW incinerators in Maine. An annual limit of 310,000 tons on the amount of unprocessed MSW destined for Maine Energy, and then incinerated at Maine Energy or bypassed to Pine Tree Landfill, was selected. This is not the annual amount of MSW anticipated to come to Pine Tree Landfill and/or the WOTL from Maine Energy; this

is the maximum total amount of unprocessed MSW destined for Maine Energy that will be delivered to all 3 Casella owned or operated disposal facilities: Maine Energy, Pine Tree Landfill and WOTL. Unprocessed MSW from Maine Energy is only bypassed to a landfill for disposal during temporary shutdowns for repairs or maintenance, and when the amount of contracted waste exceeds the plant's capacity. Conditions #2 through 7 of that license specify the limitations and parameters under which Pine Tree Landfill can accept MSW from the Maine incinerators.

In accordance with the RFP and OSA, the applicant will not accept solid wastes generated from out-of-state sources at the WOTL. The applicant proposes to manifest all wastes brought to the facility for disposal, including those not required to be manifested by law. The Department finds that the monthly activity reports submitted to the Department must be designed to provide the data needed for determining the quantities of the various waste types, and their sources, delivered to the landfill. The Department further finds that the applicant must submit an application to the Department for review and approval prior to accepting for disposal any waste not listed in the application.

The Department received comments from the public regarding specific wastes and whether they would be regarded as in state or out of state waste. The Department responded that FEPR and ash from incinerators in Maine, as well as a limited amount of bypass, would be considered waste generated in Maine, but that waste delivered from out of state to another facility (such as a transfer station, or a compost facility if no processing occurs) for transfer to WOTL in its original form would be considered waste generated outside Maine. As noted above, the amount of bypassed MSW from the incinerators will be limited and the amount of MSW bypassed from Maine Energy, also owned by Casella, will in addition be tied to production at Maine Energy. The applicant has committed, in a letter dated March 9, 2004, that no out of state MSW will be bypassed to the landfill, and that waste from the tipping floor of any of the incinerators will not be transported to the landfill if it contains any out of state waste. The Department also received comments that the landfill would be required to accommodate MSW from the closure of existing municipal

landfills due to Department violations; as noted above, MSW will be accepted only from the 4 incinerators in Maine. Additional sources of MSW would require Department review and approval prior to acceptance for disposal.

B. Waste Characterization and Compatibility: The procedures for characterizing the solid wastes accepted at the landfill are identified in the Solid Waste Characterization Plan for the facility; the plan is located in Appendix K of the application and will be part of the facility's operations manual. The facility proposes to accept non-hazardous wastes for disposal using the same procedure as approved for Pine Tree Landfill. The wastes fall into 2 categories: those accepted on an ongoing basis under general permitting requirements for specific categories of wastes and those accepted under individual permits. Each waste required to be characterized by the Rules has a testing frequency, list of parameters to be tested for, and the acceptance criteria for each parameter, based on the requirements of Chapter 405 of the Rules. Copies of all analyses will be kept on file at the facility and may be viewed during normal business hours. The wastes proposed for disposal in the landfill have been demonstrated to be compatible with each other and the liner and leachate collection system components at Pine Tree Landfill; the same materials are proposed to be used in the construction of cells 3 through 11 at WOTL.

The Department received several comments related to the waste characterization process and its reliability in terms of keeping hazardous wastes out of the facility. The Department finds that the waste characterization plan proposed for use at WOTL provides adequate provisions for the testing of wastes coming into the landfill and a proven, reliable method of keeping hazardous waste from being disposed. The Department further finds that the proposed waste streams are compatible with each other and the components of the landfill system.

C. Reporting Requirements: As described in Finding of Fact #13.A, above, the Department finds that a monthly summary of the wastes accepted for disposal will be submitted to the Department, and the monthly activity

reports submitted to the Department must be designed to provide the data needed for determining the quantities of the various waste types, and their sources, delivered to the landfill. As found in Finding of Fact #13.A, above, the Department finds that the information on the source and quantity of MSW accepted for disposal is to be reported to the Department on both a monthly and an annual basis, as follows:

1. The monthly reports on the wastes accepted for disposal at the landfill shall include the amount and source of unprocessed MSW accepted for disposal;

2. The total amount of (a) unprocessed MSW incinerated at Maine Energy and (b) MSW bypassed from Maine Energy for disposal at the WOTL and at Pine Tree Landfill's Secure III Landfill Expansion shall not exceed 310,000 tons in any calendar year, unless changes in conditions or circumstances occur that cause the Department to revise this cap; and

3. In addition to the specific requirements of Chapter 401.4(D) of the Rules, the annual reports for the facility submitted to the Department shall include the amount of unprocessed MSW received at WOTL from each of the approved sources, including statements from the incinerators providing an estimate of the percentage of the MSW that originated outside Maine.

14. AIR QUALITY

A. Fugitive Dust: To control fugitive dust from unpaved access roads, the applicant will apply water and/or calcium chloride to the road surfaces on an as-needed basis. The applicant also proposes to pave an additional portion of the access road from where it begins at Route 16 such that the first one-half mile of the road will be paved. If necessary to control dust, the applicant has also committed to pave an additional portion of the access road. The applicant has committed to daily cleaning of the paved surface using a street sweeper. The Department received comments on existing dust control methods and the potential for additional problems

with fugitive dust emissions associated with the increased traffic at the landfill entrance. The Department finds that the dust control measures proposed by the applicant are sufficient to control fugitive dust. However, the Department also finds that if staff find that operation of the landfill as proposed unreasonably adversely affects air quality additional fugitive dust control measures will be required.

B. Landfill Gas: The applicant proposes to install an active gas extraction system for control of fugitive emissions of gas generated by the landfill. Passive flares will be installed initially and monitored to determine when the gas quantity and quality is adequate to support combustion. At that time the detailed design of the active gas extraction system will be prepared and the system installed. (See Finding of Fact #9.E, above.) The Department finds that the applicant has proposed adequate measures to control fugitive emissions of gas from the landfill.

C. Odor Control: The applicant proposes to use several mechanisms to control odors associated with the facility; an odor assessment, including proposed odor control mechanisms, prepared by Odor Science & Engineering, Inc., is included in Attachment 7 of the application. As fully described in Finding of Fact #9.E, above, one of the benefits of the proposed gas management system is the control of potential landfill odor. The applicant will also employ operational practices, including the use of a portable odor neutralizer system and minimization of the active working face of the landfill. Odors associated with the leachate will be minimized by the use of an above-ground leachate storage tank instead of the existing open leachate pond. The applicant has committed to odor training of its landfill personnel, the implementation of a community odor complaint response plan, and to the installation of perimeter hydrogen sulfide monitoring instruments. The applicant will also monitor odors during the sludge mixing test plot program, described in Finding of Fact #10.A, above, and will prepare a detailed odor control plan for sludge excavation and mixing operations following completion of the program and prior to full-scale operations.

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The Department received comments from the public that odors from the existing landfill have been a problem. Staff comment that, prior to the submission of this application, no odor complaints about this facility were received by the Department.

The Department finds that the applicant has proposed odor control mechanisms sufficient to control nuisance odors. However, the Department also finds that if staff find that operation of the landfill as proposed unreasonably adversely affects air quality additional odor control measures will be required. The Department further finds that the applicant must submit to the Department for review and approval the following information on the perimeter hydrogen sulfide monitoring program prior to implementation of the program: the number and locations of instruments, based on meteorological conditions; system security measures; monitoring program details and responsibilities; and reporting procedures.

15. TRAFFIC MOVEMENT

The parcel of land which includes the landfill is located between Routes 43 and 16. Although the landfill is located much closer to Route 43 than to Route 16, it is accessed from Route 16 by a road into the property that existed at the time of the original licensing. A large wetland exists between the landfill and Route 43; the applicant does not propose to change the access to the landfill from Route 16 to Route 43 now or in the future. The access road intercepts Route 16 approximately 600 feet west of I-95.

At the time this application was filed, approximately 16 trucks were hauling sludge from the Old Town Mill, ash from Lincoln Pulp & Paper, leachate from the landfill back to the Old Town Mill's wastewater treatment plant, and gravel during the peak hour; approximately one-half of these vehicles were hauling gravel to the landfill for use as daily cover.

Attachment 4 of this application contains a new traffic assessment prepared by Eaton Traffic Engineering in accordance with the Rules.

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With the increased use proposed by the applicant, approximately 30 total vehicles (9 of them passenger vehicles) will enter the landfill during the peak hour at the initial projected waste acceptance rate of 450,000 tons/year, and up to 35 total vehicles (still 9 of them passenger vehicles) will enter the landfill during the peak hour at the highest projected waste acceptance rate of 540,000 tons/year. These peak numbers include the current vehicles, except that the gravel deliveries will cease.

The total daily number of trucks anticipated to enter the facility on a daily basis is 108 at the 450,000 tons/year rate of waste acceptance. The total daily number of trucks at the 540,000 tons/year rate is 140 trucks per day. The existing daily trips into the landfill are estimated at 45-50 trips per day.

The trucks hauling wastes that are currently disposed at the landfill are expected to continue using the same haul routes; likewise, the trucks hauling leachate to the Old Town Mill's wastewater treatment plant will continue using the same routes.

A major haul route for transporting waste in trucks weighing over 80,000 pounds from Pine Tree Landfill to WOTL is identified in the application; the route includes roads within Hampden, Bangor, Brewer, Eddington, Bradley, Milford and Old Town. During the peak hour, the number of over 80,000 pound trucks is anticipated to be 7 at 450,000 tons/year and up to 10 at 540,000 tons/year. The major haul route identified for trucks and other vehicles weighing less than 80,000 pounds is I-95; the remaining new traffic associated with the project would use I-95 to deliver waste to the landfill, and all empty trucks would use I-95 on their return trip.

The Maine Department of Transportation ("MDOT") was asked to review the traffic section of the application; it reviewed high crash locations, roadway geometrics, traffic volumes and traffic signal progression along the identified route. The volume of traffic associated with the landfill falls far below the threshold for review of the project under MDOT's Chapter 305 "Rules and Regulations Pertaining to Traffic Movement Permits", effective May 20, 2000; that threshold is 100 or more passenger car equivalent vehicles during the peak hour. In a memorandum dated December 12, 2003 MDOT concluded that the route identified in the application was acceptable in terms of geometrics, traffic

volumes, and economic feasibility, but that an alternative route identified in the MDOT memorandum as Alternative 1 was more desirable. The only difference in the two routes was the bridge used to cross the Penobscot River from Bangor into Brewer.

In response to numerous comments on traffic associated with the project, MDOT staff identified in a memorandum received by the Department on February 4, 2004 a total of 5 routes (plus I-95 for the less than 80,000 pound vehicles) that could safely accommodate the number, weight and types of vehicles transporting waste to and from the facility from the south or west. Each of the routes have minor deficiencies; however, since the drivers are likely to make their choices of routes depending on the time of day, day of the week or time of year, all of the routes are viable alternatives over which trucks now travel. MDOT noted that all of the identified routes can handle traffic generated by the landfill, and that the functionality of any of the 6 routes will not be negatively affected by the landfill's traffic.

MDOT also reviewed the Route 16/landfill access road intersection. It concluded that there is adequate sight distance for the posted speed of Route 16, and that no turn lanes are needed. No high crash locations within the immediate vicinity of the site were identified. MDOT did recommend that overhead lights be installed at the entrance to the facility to make it easier for trucks to locate the entrance.

As noted above, the Department received many comments from the public on the proposed haul route for the facility. Many commentors requested that the Department require that all haulers use I-95 to access the facility; other commentors expressed concern over increased traffic, and associated road damage and other safety and esthetic impacts, through their neighborhood.

The only change proposed to the 10,950 foot long, 24 foot-wide mostly gravel access road into the site is an extension of the paved section from the first 500 feet to the first one-half mile of the road. If necessary to control dust, the applicant has also committed to pave an additional portion of the access road. A scale, and a small scale house, are proposed to be constructed approximately 250 feet from the landfill perimeter security fence; parking will be provided at this location for only the scale house operator. The gravel parking area at the operations office

will be expanded to approximately 4,000 square feet to provide parking for up to 20 cars. The perimeter access road for the landfill is proposed to be located on top of the perimeter berm described in Finding of Fact #9.C, above. Gravel maintenance roads will also be provided for access to the leachate pond pump station, the leachate storage tank and the blower and flare for the active gas extraction system.

The Department finds that the applicant has made adequate provisions for the safe and uncongested movement of traffic of all types into, out of, and within the facility, provided it installs overhead lights, or another effective lighting system, at the entrance to the facility to make it easier for trucks to locate the entrance. The Department further finds that it is outside its purview to require that waste haulers using this facility limit their truck weights to 80,000 pounds and use I-95 as the only haul route for the facility, and affirms MDOT's statement that there is an affirmative right for all individuals and entities, public and private, domestic or commercial, to travel on all State and State Aid Highways in Maine.

16. EXISTING USES AND SCENIC CHARACTER

A. Visual Analysis: The original application included a visual impact assessment report prepared by Environmental Analysis and Design. In summary, the report concluded that the landfill would not have an unreasonable adverse effect on the scenic character of the area because of its limited viewshed, small visual magnitude and its low visual contrast.

Attachment 5 of this application contains an updated visual impact assessment report prepared by SMRT, Inc. in accordance with the Rules. The consultant evaluated the proposal in terms of unreasonable interference with views from established public viewing areas as well as other potential viewshed locations. The applicant states that the landfill will not be visible from an established public viewing areas as defined by the Rules or any new viewsheds. As predicted in the original application, people traveling on Route 43 in a northerly direction will be able to see the landfill along an approximately 3/8 mile long stretch; the view will last about 21 seconds if the viewer is driving the speed limit. The applicant

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has offered to plant a tree screen along this stretch if permission is granted by the landowner.

The Department received written comments from a Route 43 resident who owns property and a business off Route 43. The commentor noted that the landfill is currently visible from Route 43, in contradiction to the original visual assessment, and that the landfill would be visible from Route 43, Route 16, I-95 and at other points within Old Town if the Department did not limit the height of the landfill. He commented that the proposed final elevation would be 150 feet higher than the highest point in Old Town (Fairdale Hill, at 240 feet).

The Department retained Terrence J. DeWan & Associates, Inc. ("tjd&a") to perform an independent review of SMRT, Inc.'s updated assessment. Tjd&a's report, dated February 6, 2004, confirms the results of SMRT, Inc.'s assessment. It also makes several suggestions for making the updated visual impact assessment a stand-alone document, and for providing corroborative information on the conclusions reached in the SMRT, Inc. report. At staff's request, tjd&a also responded to written comments from the Route 43 resident. Although tjd&a agrees with some of the commentor's statements, tjd&a concludes that the proposed increase in the landfill's height will not unreasonably adversely affect the use of the resident's property or other existing uses in the area.

The Department finds that the design of the project continues to take into account the scenic character of the surrounding area, and that the development has been located and screened to minimize its visual impact, but that the visibility of the landfill would be lessened if the section of Route 43 where the landfill is visible is screened. The Department finds that the development will not have an unreasonable effect on the scenic character of the surrounding area, provided the results of a future visual analysis, performed when the final elevation of the landfill reaches 330 feet, agree with the projections provided in the application, and provided the applicant negotiates in good faith with the Route 43 landowner for permission to plant a tree screen in the location identified in the visual impact assessment.

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B. Noise: The original application included a noise study prepared by Acentech Incorporated ("Acentech"). In summary, the study demonstrated that the noise standards of the applicable Rules would be met by the implementation of several noise abatement measures during construction and operation, and that noise would be reduced by atmospheric adsorption and the proposed buffer strips around the facility. As a check on the actual noise levels from the facility, the Department placed Condition #7 in the original license. The condition required that noise studies be performed within the first month of operation, and again within the first month of operation of cell 4 of the landfill. The noise study performed when the landfill became operational demonstrated the facility was operating within the noise limits; cell 4 has not been developed.

The applicant retained Acentech to address noise impacts associated with the proposed facility. A copy of Acentech's report is contained in Attachment 6 of the application. The noise study modeled the projected noise levels from the landfill operating equipment to the nearest property boundary and the nearest residence; the study demonstrated that the facility will comply with the 60 dBA day time noise standards of the Rules. Between 7 p.m. and 7 a.m., the 50 dBA night time standards of the Rules apply, and the applicant will limit the spreading and compacting equipment to 1 compactor and 1 dozer or loader if necessary to meet the noise standards. (The landfill is proposed to operate between 6 a.m. and 8 p.m. on weekdays.)

The Department finds that the noise study for the proposed facility indicates that it will not generate excessive noise at the property boundary or at any protected location as defined by the Rules. However, the Department also finds that the applicant must perform 2 additional noise studies to confirm the model used in the study: one within the first month of operation of cell 3, and the other within the first month of operation of cell 9. If the actual noise limits are above the limits in the Rules, additional noise measures must be promptly implemented to meet the requirements of the Rules.

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C. Existing Uses and Conditions: The portions of the 780 acre parcel that are currently undeveloped will not be altered, and the current allowed uses of the property by the public described in Finding of Fact #24 of the original order will be allowed to continue. The Department finds that its original finding that the facility will not unreasonably interfere with existing uses and conditions, and has enhanced values in some areas, is not changed.

17. STORMWATER MANAGEMENT

The Department found in the original license that the project is not located on a floodplain. The applicant has provided an updated stormwater management plan for the proposed facility, prepared in accordance with the Rules and the three general objectives of the Department's *Stormwater Management for Maine: Best Management Practices* (MDEP, 2003): effective drainage, flood prevention and erosion control. The plan is contained in Section 5.7 of the application.

The proposed stormwater management measures, which include the erosion and sedimentation control plan for the facility (see Finding of Fact #18, below), will assure that peak runoff rates for the post-development conditions at the site will be equal to or less than the peak runoff rates for the site's pre-development (prior to 1991) conditions. A major consideration in the grading and layout of the landfill in the original application was the minimization of wetlands impact; the same consideration was applied to the vertical increase of the landfill proposed in this application. Existing drainage courses will be utilized where feasible; no surface water drainage outlet structures from the developed site will discharge concentrated flows directly onto abutting properties. Where necessary, the runoff from the developed site will discharge into detention or sedimentation basins that will attenuate peak flow rates to the unnamed tributary feeding Pushaw Stream, located at the lowest elevation of the facility. This runoff will be only from areas outside the landfill footprint and from landfill areas that have received final or intermediate cover material. Runoff from areas where waste is exposed or has received only daily cover is considered leachate and is handled within the leachate collection and conveyance systems.

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A drumlin oriented in a northwest to southeast direction effectively divides the 780-acre parcel into 4 major watersheds: northeast, northwest, southeast and southwest. The Department received comments from the public that the ditches on the Stagecoach Road contain runoff contaminated by the existing landfill. Staff comment that the Stagecoach Road is located in the northwest watershed of the parcel. The landfill is located in the southwest watershed of the parcel, and runoff from this watershed drains to a wetland area that serves as the headwater of an unnamed tributary that empties into Pushaw Stream, not towards the Stagecoach Road.

The Department has also received comments from the public that contaminated runoff from the landfill can flow into ditches along Route 43 and onto property across Route 43. Staff comment that water in the unnamed stream directly downgradient of the landfill has been consistently sampled at least 3 times per year since 1991; no changes in surface water quality have been observed. Staff also comment that no analyses or other documentation of contamination of ditches in either area was submitted to the Department.

Staff comment that all issues raised in the initial engineering review memorandum regarding the provisions for stormwater management have been satisfactorily resolved.

The Department finds that the facility's stormwater management plan will control run-on and run-off; and infiltrate, detain or retain water falling on the facility site during a storm of intensity up to and including a 25-year, 24-hour event such that the rate of flow of stormwater from the facility after construction does not exceed the rate of outflow of stormwater from the facility prior to construction of the facility. The Department also finds that the preponderance of the evidence indicates that runoff from the landfill is not impacting ditches along Route 43 or the Stagecoach Road.

18. EROSION AND SEDIMENTATION CONTROL

The application contains an erosion and sedimentation control plan prepared in accordance with the *Maine Erosion and Sedimentation Control Best Management Practices* (MDEP, 2003) and the requirements of the Rules. The plan is

contained in Appendix F of the application. The plan includes the construction of two new stormwater detention ponds, several new drainage structures (ditches, catch basins and culverts), and it addresses the inclusion of terrace drainage swales and downchutes on the landfill cover system. To minimize erosion during construction and operation, both temporary and permanent erosion control measures will be used. All measures will be continuously monitored and all necessary maintenance will be performed to assure that the measures are functioning properly. In response to staff comments, the applicant confirmed that the design of construction-related erosion and sedimentation control systems will be included in the detailed design package for each phase of the landfill development. For all cells other than cell 3, which will utilize the existing sedimentation control structures, it is anticipated that water generated within the cell construction area will be contained within that landfill cell, thus allowing sediment to settle out within the cell before being pumped out. If necessary, additional sediment removal techniques will be employed.

The Department finds that ongoing construction of the proposed facility will not cause unreasonable sedimentation or erosion of soil, provided the erosion and sedimentation control plan is implemented as described in the application, and as amended during the review of the detailed design package submitted for the Department's review and approval prior to each phase of landfill construction.

19. RECYCLING AND SOURCE REDUCTION

The landfill will accept only solid waste that is subject to recycling and source reduction programs at least as effective as those imposed by State law. The recycling and source reduction programs included in the OSA will affect the region served by the landfill and the rest of the state, and includes several innovative recycling initiatives that will advance the State's solid waste management policy.

In signing the OSA, Casella agreed, in part, to use its best efforts to operate the landfill following the State's solid waste management hierarchy. Specific actions listed in the OSA include the following:

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A. Implementation of a technology for recovery and recycling of all color glass containers so that glass does not require separation by color in order to be recycled;

B. Work with the Municipal Review Committee ("MRC"), which represents over 160 municipalities that are limited partners in PERC and/or users of PERC, to:

1. through Casella's Fairfield County Recycling Division, analyze and develop the best collection, processing and marketing options for paper recycling;
2. help develop organics recycling programs that enhance or expand current practices of MRC members;
3. develop a program to collect, store and process (where applicable) universal wastes and mercury containing products; and
4. develop programs to identify, collect and properly dispose of household hazardous wastes;

C. Work with the MRC and appropriate research facilities to assess the viability of using Maine-developed ablation technology as a source of air emission control for biomass boilers combusting up to 50% clean wood from construction and demolition debris ("CDD") as a fuel source, as proposed for new GPC biomass boiler; and

D. Expand the CDD processing capability of Casella and its affiliates to achieve a decrease in CDD waste volume requiring disposal with a focus on recovering the clean CDD wood waste that would assist in meeting the biomass fuel commitment of the OSA. Other recyclable materials, including cardboard, aggregate and metals, would be separated and utilized in other applications.

The Department finds that the provisions of 38 M.R.S.A. §1310-N(5) and the Rules are not applicable to this application because it is not an application for a new landfill or an expansion of an existing landfill. (See Finding of Fact #1.C, above.) However, to address public comments on the need for additional

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recycling rather than additional disposal capacity, the applicant submitted a summary of the recycling initiatives included in its response to the RFP and in the OSA.

20. PROTECTED NATURAL RESOURCES

The original application, and the application submitted to the Army Corps of Engineers, included an extensive wetlands study of the property. The original licenses permitted the filling of 8.84 acres of wetlands, and contained a compensation plan for the activity. Condition #4 of the original license required that the original licensee submit annual reports on the restoration and enhancement projects in the compensation plan for a 3 year period; compliance with this condition has been demonstrated.

No additional wetland areas will be impacted by the proposed project. However, the reconstruction of the access road from the landfill berm to the existing leachate pump station, and the construction of the leachate force main will include construction activities within 75 feet of the upland boundary of the forested wetland to the west of the site, and thus the applicant will file Permit By Rule applications under the Department's Chapter 305, Sections 4 and 9, Regulations prior to this construction, and will comply with the standards in the regulations.

The Department finds that the proposed facility will not unreasonably adversely effect protected natural resources in that no new impact on protected natural resources will occur, provided that the applicant obtains, and complies with the standards of, permits-by-rule under 06-096 CMR Chapter 305.4 and 305.9.

21. SETBACKS AND BUFFERS

The setbacks to public roads, private residences, public and private water supplies protected natural resources, airports and the property boundary are not changed as a result of this proposal, and thus continue to exceed the setbacks set forth in the Rules. As required by Condition #9 of the original license, the 100 foot forested buffer between the western side of the facility between the landfill and the emergent wetland to the southwest of the facility will be maintained. The

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Department finds that Finding of Fact #22 of the original license, which sets forth required buffers, is not changed by this proposal.

22. UTILITIES

On site single-phase power is supplied from Route 16 via buried electrical lines. Potable water will continue to be provided by an on-site well. On-site sanitary wastewater treatment is provided by a licensed subsurface wastewater disposal facility. The applicant proposes to upgrade the facility from 113 gallons/day to 420 gallons/day; a copy of the HH200 form for the upgraded facility is contained in Attachment 10 of the application. As described in Finding of Fact #9.D, above, leachate will initially be trucked to the Old Town Mill's wastewater treatment plant, but may be transported via sewer line or truck to the City of Old Town Wastewater treatment plant in the future, if the necessary upgrades are made and the City of Old Town is willing. The Department finds that the applicant has provided for adequate utilities and the proposed facility will not have an unreasonable adverse effect on existing or proposed utilities in the municipality or area served by the utilities.

23. ALL OTHER FINDINGS OF THE ORIGINAL ORDER

The Department finds that all of the remaining Findings of Fact of the original license will be unchanged by the proposed amendment for a vertical increase, in that the horizontal footprint of the landfill will be unchanged by the proposal.

BASED on the above Findings of Fact, the Department CONCLUDES the following:

1. The applicant has provided adequate evidence of financial capacity and technical ability to meet air and water pollution control standards, provided an acceptable package for financial assurance is submitted and maintained, and provided evidence of financial capacity for construction of each cell is provided as part of the detailed design package submitted prior to each construction season.

2. The information submitted by the applicant and supplied by state and local officials regarding Casella's previous violations of certain environmental laws, as described in the civil and criminal record for SPO and Casella/NEWSME

Operations, demonstrates that Casella has willingly conducted all required corrective actions; thus the civil and criminal record does not provide a basis to deny approval for SPO to own and control, and NEWSME Operations to operate, the landfill as proposed in this application in compliance with Maine laws and regulations.

3. The applicant has provided adequate evidence of title, right or interest in the parcel of property containing the existing landfill.

4. The proposed vertical increase of the landfill will not pose an unreasonable risk that a discharge to a significant groundwater aquifer will occur in that the landfill is not located over a significant sand and gravel aquifer and the proposed vertical increase of the landfill does not pose an unreasonable threat to the quality of a significant sand and gravel aquifer which it does not overlie, or to an underlying fractured bedrock aquifer, in that soils under the landfill and the proposed design of the vertical increase, combined with the groundwater flow conditions, provide adequate protection to water quality.

5. The proposed vertical increase of the landfill will not pollute any waters of the State, contaminate the ambient air, constitute a hazard to health and welfare, or create a nuisance, provided the environmental monitoring plan for the landfill is updated in accordance with staff recommendations, and provided the landfill is constructed, operated, closed and monitored and maintained throughout the post-closure period in accordance with staff recommendations and the approved design and then-current operational standards, including reporting requirements. Compliance with the intent of the Solid Waste Management Regulations has been affirmatively demonstrated.

6. The applicant has adequately addressed the settlement and stability of the landfill, provided it monitors the facility in accordance with an approved settlement and stability monitoring plan that incorporates all recommendations made by staff.

7. The applicant has made adequate provisions for traffic movement of all types into, out of and within the development area, provided overhead lights, or another effective lighting system as approved by the Department, are installed at the

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entrance to the access road prior to the operation of cell 3. The traffic increases attributable to operation of the landfill will not result in unreasonable congestion or unsafe conditions on a road in the vicinity of the project.

8. The applicant has made adequate provisions for fitting the development harmoniously into the existing natural environment and the development will not adversely affect the existing uses, scenic character, or natural resources in the municipality or in neighborhood municipalities provided the landfill is properly operated, properly closed, and properly cared for after closure, all in accordance with then-current regulatory requirements; that the applicant obtains the necessary Natural Resource Protection permit-by-rules before construction of the MSE berm; and provided the results of future visual and noise analyses confirm the projections contained in the application.

9. The proposed change in the landfill will not cause unreasonable erosion of soil or sediment, nor inhibit the natural transfer of soil. The applicant has made adequate provisions for controlling erosion and managing stormwater, provided the approved stormwater management plan and erosion control plan are fully implemented.

10. The applicant has made adequate provisions for utilities, including water supplies, sewerage facilities, solid waste disposal and roadways required for the development, and the landfill will not have an unreasonable adverse effect on existing or proposed utilities in the City of Old Town, the Town of Alton, or the area served by those services.

THEREFORE the Department APPROVES the above noted application of the STATE OF MAINE, ACTING THROUGH THE STATE PLANNING OFFICE, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations.

1. The Standard Conditions of Approval, a copy attached as Appendix A.

2. The applicant shall take all necessary actions to ensure that its activities or those of its agents do not result in unnecessary or noticeable erosion of soils on site during construction or operation of the facility.

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3. Prior to May 15, 2004, the applicant shall submit a financial assurance package for closure and post-closure care to the Department for review and approval that meets requirements of the Rules. The applicant shall implement the approved package. The approved financial assurance package shall be updated on an annual basis by the applicant in accordance with the Rules.

4. The applicant shall complete the investigation in the areas around and beneath detention ponds 1 and 2 in accordance with the workplan approved by the Department.

5. The applicant shall update the EMP on an ongoing basis as recommended by staff, beginning with the submittal of the 2003 Annual Report. Monitoring of detention ponds 1 and 2, and monitoring wells #DP-4, #P-04-02, and #P-04-04 shall be added to the EMP. The 3 new well clusters proposed in the application shall be installed in locations approved by the Department, and added to the monitoring program for the facility. All landfill underdrain discharge locations shall be added to the monitoring program for the facility; they shall be monitored monthly for the field parameters in Appendix A, Column 1 of Chapter 405 of the Rules, and sampled 3 times per year for the facility's suite of detection parameters at the same time as the other monitoring locations.

6. The applicant shall initiate assessment monitoring in accordance with the Rules at monitoring wells MW-204, MW-302, MW-223B, MW-212 and MW-303 during the Spring 2004 sampling event. New wells installed in accordance with Condition #4, above, shall be included in the assessment monitoring program during the Summer 2004 sampling event.

7. The applicant shall continue to route the discharge from the leachate pond underdrain into the leachate storage pond until the Department authorizes a resumption of the surface discharge. The leachate pond underdrain water quality shall be sampled weekly throughout the rest of 2004 for field parameters including pH, specific conductivity and temperature, and an analysis of the results shall be included in the 2004 annual report for the facility. The analysis of the results shall include a proposal for future monitoring at this location, and the

necessary changes to the EMP. After review and approval by the Department, the changes shall be incorporated into the EMP and implemented as approved.

8. The applicant shall construct the sludge mixing test plot in accordance with the proposed plan, as revised in accordance with staff recommendations. At least 60 days prior to landfilling of sludge from cells 1 and 2 with other waste outside of the test plot, the applicant shall propose to the Department for review and approval, based on the findings of the test plot program, a ratio of existing and new sludge to incoming waste to be placed in cells 1, 2 and 3, detailed procedures for mixing the waste streams, and an odor control and monitoring plan for sludge excavation and mixing operations.

9. At least 60 days prior to landfilling of sludge from cells 1 and 2 with other waste outside of the test plot, the applicant shall submit to the Department for review and approval, based on the findings of the test plot program, an updated geotechnical stability analysis and a finalized geotechnical monitoring plan for the landfill.

10. At least 45 days prior to the commencement of waste placement in cell 3, the applicant shall submit to the Department for review and approval an updated operations manual, including a finalized conceptual cell development plan for the life of the landfill and a detailed cell development plan for the next 2 years of operation. The updated operations manual shall address all staff recommendations as agreed to in SME's January 22, 2004 submittal addressing staff memoranda. The operations manual shall be updated again following completion of the test plot program and prior to excavation of sludge from cells 1 and 2. All changes to the operations manual for the facility are to be implemented as approved by the Department.

11. The applicant shall include in each of the facility's annual reports proposed revisions to the operations manual, including an annually updated cell development plan. Each year's annual report shall also include an evaluation of the sizing and the installation timing of the active gas extraction system components over the reporting period, and an evaluation of the effectiveness of the system based on the quantities and types of wastes projected for the next year.

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The operations manual shall be revised as conditions dictate and to comply with any changes in the operating requirements in the Rules.

12. Prior to the commencement of operations in cell 3, the applicant shall install overhead lights, or another lighting system that identifies the entrance road into the facility, at the entrance to the facility.

13. The applicant shall obtain prior to construction of the MSE berm, and comply with the standards of during construction, permits-by-rule under 06-096 CMR Chapter 305.4 and 305.9.

14. At least 60 days prior to the planned commencement of operations in cell 3, the applicant shall submit to the Department for review and approval the following information on the perimeter hydrogen sulfide monitoring program: the number and locations of instruments, based on meteorological conditions; system security measures; monitoring program details and responsibilities; and reporting procedures.

15. At least 6 months prior to the planned commencement of operation of new cells or other structures, the applicant shall submit to the Department for review and approval detailed design packages for each construction activity. The detailed design packages shall include a complete set of project specific contract bid documents, including construction drawings, technical specifications, contract administrative documents, construction monitoring and documentation provisions, construction quality assurance plans, erosion and sedimentation control plans, and the following information:

    A. For the landfill cells other than cell 3, the perimeter berm, the leachate storage tank and the ancillary structures, the detailed design packages shall also address all staff recommendations regarding the design, the technical specifications, the construction drawings, and the construction quality assurance plan as agreed to in SME's January 22, 2004 responses to the comments provided in 3 initial engineering review memoranda by staff. In addition, the applicant shall include a demonstration of financial capacity for costs associated with the construction of each cell developed after cell 3.;

B. For the active gas extraction system, the detailed design package shall also address staff recommendations regarding the design, the technical specifications, the construction drawings, and the construction quality assurance plan as agreed to in SHA's submittal dated January 21, 2004 and the applicant's letter dated February 4, 2004. The detailed design package for the initial construction of the active gas extraction system shall also include the active gas system operating plan, inclusive of monitoring, record-keeping, and reporting procedures; and the provisions to be implemented to protect and provide safe access to the well-heads if temporary geomembrane tarps are proposed for intermediate cover; and

C. For the phased final cover system, the detailed design package shall include the supporting information required by the applicable provisions of Chapter 401.5 of the Rules, and address the recommendations in staff memoranda as agreed to in SME's submittal dated January 22, 2004 and as responded to in staff memoranda dated January 26, 28 and 30, 2004.

If the Rules applicable to any aspect of the design and construction of the vertical increase of the landfill and its ancillary structures change during the development of the landfill, the applicant shall address the new requirements in subsequent submittals.

16. With regards to the acceptance of MSW for disposal, consistent with its proposal, the applicant:

A. shall not dispose of unprocessed MSW from any source other than bypass from the following sources: PERC incinerator in Orrington and the Maine Energy incinerator in Biddeford; waste delivered under an interruptible contract with PERC; or waste delivered in excess of processing capacity at other MSW incinerators in Maine;

B. shall not accept waste from an incinerator without verifiable authorization from either the owner/operator of an incinerator or from a regulatory entity with jurisdiction over the incinerator that a bypass has been called

or, for holders of interruptible contracts, the contracts have been interrupted in accordance with the contractual provisions;

C. shall limit the total amount of (a) unprocessed MSW incinerated at Maine Energy and (b) MSW bypassed from Maine Energy for disposal at the WOTL and at Pine Tree Landfill's Secure III Landfill Expansion to no more than 310,000 tons in any calendar year, unless changes in conditions or circumstances occur that cause the Department to revise this cap; and

D. shall notify the Department if waste deliveries in excess of processing capacity at MSW incinerators continue from a particular incinerator for a period exceeding 1 week, and provide such information as the Department may request to demonstrate that the deliveries are due to either planned outages or unplanned production problems.

17. The monthly activity reports submitted to the Department by the applicant shall provide the data needed to determine the quantities of the various waste types, and their sources, delivered to the landfill. The monthly reports on the wastes accepted for disposal at the landfill shall include the amount and source of unprocessed MSW accepted for disposal.

18. Prior to accepting for disposal any waste not listed in the application, the applicant shall submit an application for the new waste to the Department for review and approval.

19. The applicant shall include in the annual reports for the facility submitted to the Department, in addition to the specific requirements of Chapter 401.4(D) of the Rules, the amount of unprocessed MSW received at WOTL from each of the approved sources.

20. If Department staff find that operation of the landfill as proposed unreasonably adversely results in unreasonable odors or fugitive dust emissions, the Department shall require additional odor control measures or fugitive dust control measures at the facility.

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21. The applicant shall perform 2 additional noise studies in accordance with the provisions of the Rules: one within the first month of operation of cell 3, and the other within the first month of operation of cell 9. The results of each of the noise studies shall be submitted to the Department for its review and comment within 2 weeks of completion. If the actual noise levels are above the limits prescribed in the Rules, additional noise measures shall be implemented to meet the requirements of the Rules within 1 month of the submittal of the noise study.

22. The applicant shall conduct a future visual analysis, performed when the final elevation of the landfill reaches 330 feet, and demonstrate that the results agree with the projections provided in the application. If that demonstration cannot be made, the applicant shall propose alternative mechanisms for meeting the visual impact standards of the Rules within 1 month of the date of the visual analysis.

23. The applicant shall negotiate in good faith with the Route 43 landowner for permission to plant a tree screen in the location identified in the visual impact assessment.

24. The applicant shall submit the detailed construction plans for the placement of phased final cover to the Department for its review and approval at least 90 days prior to each application of final cover. In addition, the applicant shall submit to the Department for its review and approval a final closure plan for the landfill, prepared in accordance with the Rules in effect at that time, and complete final closure of the landfill in accordance with the approved final closure plan. The final closure plan shall include a post-closure monitoring and maintenance plan covering a period of at least 30 years following closure. The post-closure monitoring and maintenance plan shall be revised throughout the post-closure period to comply with changes in site conditions or any changes in

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the post-closure monitoring and maintenance requirements of the Rules. Post-closure monitoring and maintenance shall continue until the Department approves its cessation.

DONE AND DATED AT AUGUSTA, MAINE THIS 9th DAY

OF April, 2004.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Dawn R Gallagher

Dawn R. Gallagher, Commissioner

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

Date of initial receipt of application: October 30, 2003
Date application accepted for processing: November 21, 2003

Date filed with Board of Environmental Protection:

XCD51106/cwd

Landfill Expansion License #S-020700-WD-BI-N (2017)

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

BOARD ORDER

IN THE MATTER OF

STATE OF MAINE, ACTING THROUGH	)	SOLID WASTE LICENSE,
THE BUREAU OF GENERAL SERVICES	)	NATURAL RESOURCES
OLD TOWN, PENOBSCOT COUNTY, ME	)	PROTECTION ACT, AND
JUNIPER RIDGE LANDFILL EXPANSION	)	WATER QUALITY CERTIFICATION
#S-020700-WD-BI-N and #L-19015-TG-D-N	)	
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

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Reference to "Finding [#]" refers to the specified section in the Findings of Fact narrative portion of the license. Conclusions and Conditions are listed separately at the end of the license.

STATE OF MAINE, ACTING THROUGH THE BUREAU OF GENERAL SERVICES OLD TOWN, PENOBSCOT COUNTY, ME JUNIPER RIDGE LANDFILL EXPANSION #S-020700-WD-BI-N and #L-19015-TG-D-N (APPROVAL WITH CONDITIONS)	))))))	SOLID WASTE LICENSE, NATURAL RESOURCES PROTECTION ACT, AND WATER QUALITY CERTIFICATION NEW LICENSE

Pursuant to the provisions of the *Maine Hazardous Waste, Septage and Solid Waste Management Act*, 38 Maine Revised Statutes (M.R.S.) §§ 1301 to 1319-Y; *Solid Waste Management Hierarchy*, 38 M.R.S. §2101; the *Rule Concerning the Processing of Applications and Other Administrative Matters*, 06-096 Code of Maine Rules (C.M.R.) ch. 2 (last amended October 19, 2015); the *Solid Waste Management Rules: General Provisions*, 06-096 C.M.R. ch. 400 (last amended April 6, 2015), *Landfill Siting, Design and Operation,* 06-096 C.M.R. ch. 401 (last amended April 12, 2015), and *Water Quality Monitoring, Leachate Monitoring, and Waste Characterization*, 06-096 C.M.R. ch. 405 (last amended April 12, 2015) (collectively, the Rules); the *Natural Resources Protection Act* (NRPA), 38 M.R.S. §§ 480-A to 480-JJ; Section 401 of the *Federal Water Pollution Control Act*, 33 U.S.C. § 1341; *Wetlands and Waterbodies Protection*, 06-096 C.M.R. ch. 310 (last amended January 26, 2009); and *Assessing and Mitigating Impacts to Existing Scenic and Aesthetic Uses*, 06-096 C.M.R. ch. 315 (effective June 29, 2003), the Board of Environmental Protection (Board) has considered the application of the State of Maine acting through the Bureau of General Services, with all supportive data, agency review comments, and other related materials on file, and FINDS THE FOLLOWING FACTS:

APPLICATION OVERVIEW AND PROCEDURAL HISTORY

1. APPLICATION SUMMARY

A. Application

The State of Maine, acting through the Bureau of General Services (BGS), has applied for Maine Hazardous Waste, Septage and Solid Waste Management Act, Natural Resources Protection Act, and Water Quality Certification approval to construct a 9.35 million cubic yard expansion of the existing Juniper Ridge Landfill (JRL), located in Old Town, Maine. The northern edge of the property parcel borders, and a portion of the access road is located in, Alton, Maine. The solid waste application under the Maine Hazardous Waste, Septage, and Solid Waste Management Act and the land application under NRPA were processed as a consolidated licensing proceeding and are both addressed in this license.

BGS, as the owner of JRL, and NEWSME Landfill Operations, LLC (NEWSME), as the operator of JRL, prepared the application for the proposed expansion.

The NRPA application was originally identified as license #L-24251-TG-C-N, which was incorrect. It is now correctly identified as license #L-19015-TG-D-N.

B. History

The following history is a summary and does not include all licensing actions:

(1) On July 28, 1993, James River Paper Company, Inc. was issued a license to construct and operate a 68-acre secure landfill, known as the West Old Town Landfill, to dispose of the James River Paper Company's pulp and papermaking residuals (license #S-020700-7A-A-N). The project impacted 1.31 acres of freshwater wetland. The compensation package included preservation of 27.92 acres of land adjacent to the facility and the restoration and enhancement of 1.76 acres of wetland within the preserved parcel.

(2) On August 24, 1995, the Department approved, with conditions, a modification to the compensation package (licenses #L-19015-31-A-M and #S-20700-DW-B-M).

(3) On October 21, 2003, the Department issued conditional approval for the transfer of licenses for the West Old Town Landfill, from the Fort James Operating Company, to the State of Maine, State Planning Office (SPO) (licenses #S-020700-WR-M-T and #L-019015-TH-C-T); the transfer became effective when the sale of the landfill to the State of Maine, acting by and through SPO, occurred on February 5, 2004.

(4) On February 5, 2004, the State of Maine, acting by and through the SPO, and Casella Waste Systems, Inc. (Casella) entered into an Operating Services Agreement (OSA) for the operation of the West Old Town Landfill.

(5) On April 9, 2004, the Department approved an amendment application (license #S-020700-WD-N-A) for a vertical increase in the final elevation of the landfill and the disposal of additional waste streams.

(6) In 2006, the West Old Town Landfill became known as the Juniper Ridge Landfill.

(7) On January 31, 2012, the Department issued to the State of Maine, acting through the SPO, a Public Benefit Determination (license #S-020700-W5-AU-N) partial approval, with conditions, for additional landfill capacity of 9.35 million cubic yards, decreased from the original 21.9 million cubic yard capacity proposed.

(8) Pursuant to PL 2011, ch. 655, § GG-69, on July 1, 2012, the BGS, within the Department of Administrative and Financial Services (DAFS), became the state agency acting as the owner and licensee of JRL. The Department

of Economic and Community Development is the manager of JRL. NEWSME, a wholly-owned indirect subsidiary of Casella, operates the landfill for the State of Maine, acting through the Bureau of General Services.

(9) To date, approximately 62.6 acres of the facility's 68-acre existing licensed footprint have been developed, including Cells 1, 2, 3A, 3B, 4, 5, 6, 7, 8, and 9 (current active cell).

C. Terms and Acronyms

The following terms and acronyms can be found in this license and are listed in Table 1 for ease of reference:

Table 1: License Terms and Acronyms

applicant	Refers to both BGS and NEWSME (or a successor operator)
Board	Maine Board of Environmental Protection
BGS	Bureau of General Services
BMP	Best Management Practices
Casella	Casella Waste Systems, Inc.
CDD	Construction and Demolition Debris
C.M.R.	Code of Maine Rules
dBA	Decibels adjusted for frequency extremes
Department	Maine Department of Environmental Protection
EMP	Environmental Monitoring Plan
FEMA	Federal Emergency Management Agency
FEPR	Front End Process Residue
GCL	Geosynthetic Clay Liner
H_2S	Hydrogen Sulfide
HDPE	High-Density Polyethylene
JRL	The Juniper Ridge Landfill
LFG	Landfill Gas
MDOT	Maine Department of Transportation
M.R.S.	Maine Revised Statutes
MSW	Municipal Solid Waste
MSW Bypass	Any MSW that is destined for disposal or processing at a solid waste incinerator, but that cannot be disposed of or processed at that incinerator because of the incinerator's malfunction, insufficient capacity, inability to process or burn, down-time, or any other comparable reason as approved by the Department
NEWSME	NEWSME Landfill Operations, LLC
NRPA	Natural Resource Protection Act

OBW	Oversized Bulky Waste
OSA	Operating Service Agreement
ppb	Parts per Billion
PBD	Public Benefit Determination License
PIR	Preliminary Information Report
Rules	The Department's Solid Waste Management Rules, including 06-096 C.M.R. chs. 400, 401, and 405
SME	Sevee & Maher Engineers, Inc.
Soft Layer	A protective layer of waste above the liner and leachate collection systems
State Plan	Maine Materials Management Plan: 2014 State Waste Management and Recycling Plan Update & 2012 Waste Generation and Disposal Capacity Report, January 2014, prepared by the Maine Department of Environmental Protection
SVP	Significant Vernal Pool

D. Summary of Proposal

The application is for the construction and operation of a 9.35 million cubic yard expansion at JRL. The existing solid waste footprint is proposed to be expanded by 54 acres, to be developed in phases. An additional 20 acres is planned for ancillary infrastructure including roads, piping, sedimentation ponds, scales, and buildings. The proposed expansion would extend the life of the landfill by approximately 10 to 12 years.

The proposed expansion design consists of various engineered systems for the construction and operation of the landfill. Landfill gas generated on-site will be combusted in the facility's flare. The leachate from the expansion will be treated off-site, as is the current practice.

The requested wastes to be placed in the proposed expansion are similar to the accepted wastes currently allowed in the existing landfill. The accepted wastes will include only non-hazardous waste generated within the State and will not include MSW, except for MSW bypass as described in Finding 37 of this license.

The application for the proposed expansion includes the direct alteration of 2.04 acres of freshwater wetlands. A compensation plan was proposed for wetland impacts. Additionally, a Permit-by-Rule Notification Form (PBR#60159) was submitted for clearance for an electrical line and perimeter fence through the critical terrestrial habitat of a significant vernal pool (SVP) pursuant to *Permit By Rule Standards*, 06-096 C.M.R. ch. 305, § 19 (last amended June 8, 2012). The Department accepted the PBR on July 29, 2015.

The solid waste and NRPA applications were accepted as complete for processing on August 7, 2015 and July 31, 2015, respectively. The Department commented on various aspects of the application and received responses. These include the following: November 12, 2015 Department review letter on select portions of the application; January 22, 2016 Department review transmittal letter with two technical memoranda; March 4, 2016 BGS and NEWSME response to comments; April 4, 2016 Department follow-up comment transmittal letter with two technical memoranda; May 13, 2016 BGS and NEWSME follow-up responses; and July 1, 2016 Department letter with two memoranda.

E. Ownership and Operation of the Juniper Ridge Landfill

The State of Maine, acting through BGS, owns JRL. Casella is the operator of the landfill through NEWSME, a Casella subsidiary. The terms and conditions of NEWSME's operation of the landfill are established by the OSA between the State of Maine and Casella dated February 5, 2004, and amended on July 24, 2006 and November 2, 2006.

In accordance with the OSA, Casella is required to pay all costs associated with the development, operation, closure and post-closure care of the landfill and the proposed expansion. In addition, Casella is required by the OSA to establish and maintain financial assurances for the landfill and the expansion sufficient to meet the closure and post-closure care provisions of the applicable Rules, assume liability for the landfill and the proposed expansion under both the current and future conditions, and assure that adequate disposal capacity is provided for the wastes currently disposed in the landfill for at least a 20-year period. Resolve 2003, Chapter 93 requires contract terms and conditions to be "revenue-neutral to the State and as the office [former Executive Department, State Planning Office] determines are advisable and in the public interest."

NEWSME has prepared an application to expand JRL in accordance with the terms of the OSA. The OSA is a contract between the State of Maine, acting through BGS, and Casella. The Board and Department are not parties to the OSA. Section 4.1 of the OSA includes language that specifies that the State shall work with Casella in maintaining in the State's name the existing permit, amendments, and all permits, licenses, statutory amendments and legislation, approvals and authorizations reasonably requested by Casella and agreed to by the State for the operation of the landfill in accordance with the terms of the OSA, including without limitation the expansion permit.

Reference to the "applicant" in this license determination refers to both BGS, as the owner of JRL, and NEWSME, as the current operator, acting as an agent on behalf of BGS in accordance with the terms in the OSA.

2. PUBLIC PARTICIPATION

A. Pre-Application Requirements

(1) Preliminary Information Report

A Preliminary Information Report (PIR) is required by 06-096 C.M.R. ch. 401, § 1(E). The PIR, prepared by SME, was submitted to the Department on November 22, 2006 for a larger 106-acre expansion with 22 million cubic yards of capacity. The proposed 54-acre expansion is to be located within the boundary of the area described in the original submittal. A follow-up meeting was held on February 21, 2007 among representatives of the SPO (since abolished), the Department, NEWSME, SME, and Pierce Atwood, LLP to discuss the PIR.

(2) Determination of Environmental Feasibility

The Department issued a letter addressing the PIR on April 13, 2007 stating that the proposed expansion appeared to be environmentally feasible and that the siting criteria of 06-096 C.M.R. ch. 401, § 1(C)(2) did not prohibit the proposed expansion.

(3) Pre-Application Meetings

The Department's rule at 06-096 C.M.R. ch. 2, § 10 includes requirements for pre-application and pre-submission meetings. The applicant held four pre-application meetings in 2014 with the Department and interested persons, including the City of Old Town, the Landfill Advisory Committee, the Penobscot Nation, and the general public. The Town of Alton did not attend the pre-application meetings. The meetings took place September 9, October 16, November 20, and December 18. Additional meetings also occurred among the applicant, the Department, and the U.S. Army Corps of Engineers on October 29, 2014 and April 27, 2015. A representative of the U.S. Fish and Wildlife Service attended the October 29, 2014 meeting.

B. Public Informational Meeting

A public informational meeting was held on June 3, 2015 in the City of Old Town as required by 06-096 C.M.R. ch. 2, § 13. The applicant mailed notice of the public informational meeting to the abutters, the Old Town and Alton municipal offices, the Landfill Advisory Committee and the Penobscot Nation. The notice was published in the Bangor Daily News on May 22, 2015.

C. Notice of Intent to File

A Notice of Intent to File an application was published in the Bangor Daily News and Penobscot Times on July 9, 2015, in addition to being mailed to the abutters, the Old Town and Alton municipal offices, the Landfill Advisory Committee and the Penobscot Nation. The notice and mailing of the notice to the Landfill Advisory Committee fulfilled the public and local participation requirement of 38 M.R.S. § 1310-S(1), the citizen's advisory committee notification requirement of 38 M.R.S. § 1310-N(12), and the public notice requirements of 06-096 C.M.R. ch. 2, § 14.

D. Public Hearing Requests and Board Jurisdiction

The Department received 27 timely requests in August 2015 for a public hearing. On September 17, 2015 the Board, on the recommendation from the Department, voted to assume licensing jurisdiction over the application and convene a public hearing.

E. Public Hearing Process

(1) Intervenors

a. Petitions to Intervene

Intervenor status was requested by several entities. State law at 38 M.R.S. § 1310-S(3) provides municipal intervenor status, if requested, for the municipality in which the facility would be located. The City of Old Town requested intervenor status on June 4, 2015. The Town of Alton notified the Department on July 30, 2015 that it would not be requesting intervenor status. The Board received intervenor status requests from two abutting property owners, Jesse Pekkala and SSR, LLC, who have intervenor status under 38 M.R.S. § 1310-S(3-A). Petitions for intervenor status

were received from three interested persons: Edward Spencer, Dana Snowman, and Antonio Blasi.

b. Board Action on Petitions to Intervene by Interested Persons

The Board's First Procedural Order, issued on January 21, 2016, granted intervenor status to Mr. Spencer and Mr. Snowman. Mr. Blasi was denied intervenor status due to the finding that his petition did not demonstrate that he may be substantially and directly affected by the proceeding.

c. Withdrawal from Participation

On May 10, 2016, Mr. Pekkala withdrew as an intervenor.

d. Intervenor Designations

The following entities participated as intervenors in the licensing process:

i. City of Old Town, as a municipal intervenor;

ii. Edward Spencer, as an interested person petitioner;

iii. Dana Snowman, as an interested person petitioner; and

iv. SSR, LLC, as an abutter.

(2) Procedural Orders

Prior to the public hearing, the Board issued six Procedural Orders:

a. The First Procedural Order, issued on January 21, 2016, addressed the designation of intervenors as described in Finding 2(E)(1) of this license.

b. The Second Procedural Order, issued February 25, 2016, documented the pre-hearing conference held on February 10, 2016. The pre-hearing conference included a review of the procedural rules in preparation for, and during, the hearing; the roles and responsibilities of the applicant, intervenors, and Department staff; and the relevant licensing criteria. The Second Procedural Order

established the deadline for the intervenors to submit a list of issues they expected to address at the hearing through testimony, along with a list of expert witnesses.

c. The Third Procedural Order, issued May 27, 2016, documented the pre-hearing conference held on May 18, 2016. The pre-hearing conference included a review of the list of issues submitted by the intervenors, agreement on issues not contested by the intervenors, and discussion of the Board's site visit and schedule of pre-hearing testimony submissions. The Third Procedural Order established submission deadlines for the applicant's and intervenors' lists of witnesses, pre-filed direct testimony and exhibits, and pre-filed rebuttal testimony, as well as setting the dates for the public hearing.

d. The Fourth Procedural Order, issued July 7, 2016, addressed the requirements for submission of pre-filed testimony and scheduling decisions made in consultation with the parties following the June 23, 2016 Board meeting.

e. The Fifth Procedural Order, issued August 25, 2016, addressed the rulings of the Presiding Officer on the motions to strike pre-filed direct testimony.

f. The Sixth Procedural Order, issued September 28, 2016, documented the pre-hearing conference held on September 14, 2016. The pre-hearing conference included a review of procedures and a draft schedule for the public hearing.

(3) Site Visit

A site visit to JRL occurred on June 23, 2016 for the purpose of allowing Board members to view the physical features of the site and the nature of the surrounding areas. The applicant and intervenors were also present during the tour. Department staff conducted the tour and responded to Board members' questions.

(4) Public Hearing

The Board held a public hearing on the proposed expansion application on October 18 and 19, 2016 in Bangor, Maine pursuant to the Maine Administrative Procedure Act, 5, §§ 9051-9064; 38 M.R.S. §§ 341-D(2)

and 1310-S(2); and the *Rules Governing the Conduct of Licensing Hearings*, 06-096 C.M.R. ch. 3 (last amended February 16, 2015). At the hearing, the witnesses for the parties summarized their pre-filed direct and rebuttal testimony, and were subject to cross-examination by the other parties and questioning by Board members and staff.

The Board held an evening session on October 18 to receive testimony from members of the general public, and 33 persons testified at that session. Prior to the close of the evidentiary record, the Board received 31 written comments from the general public. The testimony and written comments by the general public included opposition to, and support for, the proposed expansion.

Following the filing of post-hearing briefs by the parties on November 23, 2016, the Board held a deliberative session on December 15, 2016 to review the evidentiary record with Department staff.

Issues addressed in pre-filed testimony, hearing testimony, and post-hearing briefs included, but were not limited to: the solid waste management hierarchy regarding CDD and OBW, site geology, design and operation of the proposed expansion, the facility's odor complaint procedure, stormwater management and extreme weather events, ground and surface water monitoring, leachate treatment and disposal, NRPA alternative analysis, impacts to Atlantic salmon, fees and payments to the City of Old Town for the use of CDD fines and soft layer waste, traffic on Bennoch Road, third party administration of the Declaration of Covenants and Restrictions, and hydrogen sulfide action levels and notification procedures.

Issues raised in testimony by the general public in opposition to the project included: impacts on the Penobscot River and natural resources, impacts on public health, leachate treatment, prohibiting additional waste disposal at the site, out-of-state waste coming into the State for disposal at a State landfill, and the solid waste hierarchy.

Issues raised in testimony by the general public in support of the project included: the facility as a well-designed, operated, and maintained landfill; the importance of the landfill to businesses and the community; and the need for a landfill option for material that cannot be reduced, reused, or recycled utilizing current technology and practices.

The hearing transcript and hearing documents are included in the record on file. Additional discussion of testimony and comments are addressed in the findings of fact of this license, as appropriate.

F. Draft License Comment Period

A draft license was made available for comment on April 14, 2017 through notification to the applicant, intervenors, and interested persons. The draft license was posted on the Department's website and the 15 working day comment period closed on May 8, 2017. A total of 48 commenters submitted written comments on the draft license. All of the comments were reviewed and given consideration in relation to the relevant review criteria of State laws and rules.

Comments were received from the applicant, intervenor Edward Spencer, intervenor Dana Snowman, intervenor City of Old Town, and the public (including three industry entities) and included, but were not limited to, the following:

(1) Applicant

Comments on the draft Board Order included:

a. Insertion of NEWSME in the header as an additional licensee;

b. Removal of sand dune references;

c. Changes to the test pad requirements; and

d. Comment to allow MSW if needed for the soft layer.

(2) Intervenor Edward Spencer

Comments on the draft Board Order included:

a. Hierarchy findings and the definition of waste generated within the state;

b. Usage of vague language;

c. Regulated and regulator control;

d. Non action on the PBD recommendation to review CDD imported and processing residue disposed;

e. OBW information;

f. A need for a more thorough evaluation of other viable site locations;

g. Impact on the Penobscot Nation;

h. Technical issues (underdrains and pumping with possible effect on wetlands, site selection process with respect to wetlands and surface water used, odor);

i. Leachate disposal;

j. Financial ability and criminal or civil record;

k. The endangered species evaluation; and

l. MSW bypass issues.

(3) Intervenor Dana Snowman

Comments on the draft Board Order included opposition to the acceptance of out-of-state waste.

(4) Intervenor City of Old Town

No additional comments on the Board Order were stated.

(5) Industry Entities

Comments on the draft Board Order included:

a. MSW bypass language;

b. Utilizing enforceable provisions to preclude MSW for disposal if it can be processed at another facility;

c. Removal of the clause allowing bypass of waste delivered under interruptible contracts with the PERC incinerator;

d. Additions of definitions and limits on the PERC incinerator's FEPR that may be disposed of at JRL;

e. Recalculation of the OBW limits to use an average tons/year over 5 years and to apply the Consumer Price Index (CPI) for 3 years; and

f. Clarification that if the required third party OBD audit is not completed in a timely manner through no fault of the processing facility, the OBW may be disposed of at the expansion.

(6) Public

Comments on the draft Board Order included:

a. Harm to the environment (air, land, and waters);

b. Environmental justice;

c. Meeting hierarchy requirements;

d. Not taking proactive action to meet the State's waste management goals, priorities, and policies; and

e. State designations of in-state waste and out-of-state waste.

Based on comments received, revisions were made to the draft license that address the relevant review criteria and issues raised within the purview of the Board's authority. The revisions include, but are not limited to, general clarification language, revisions to the liner system barrier soil test pad language, added information in Finding 38 on the association between wetlands and the proposed underdrains, additional clarification of the allowance of only MSW bypass in the proposed expansion, removal of the provision governing waste delivered under an interruptible contract, revisions to the bypass notification requirement, and the addition of a provision concerning the receipt if the third party OBW audit is not completed in a timely manner.

All comments received are part of the record and were made available to the Board and posted on the Department's website.

3. PROJECT DESCRIPTION AND SITE DESIGN

The 9.35 million cubic yard proposed expansion of the existing Juniper Ridge Landfill will be located within the 780-acre parcel in Old Town. The northern edge of the property parcel is on the Alton/Old Town border and a portion of the access road is located in Alton. Six cells, Cells 11 through 16, are proposed to be constructed in a phased manner. The construction is projected to begin in 2018 with Cell 11 and then is proposed to continue with a new cell constructed approximately every 2 years. In total, the proposed expansion footprint will be approximately 54 acres, plus an additional 20 acres of ancillary infrastructure, with the same peak elevation as the existing landfill, approximately 390 feet above mean sea level. The side slopes are designed at 3H:1V (horizontal to vertical), with the south side of the expansion to abut the northern side of the existing landfill.

The proposed expansion design includes an underdrain system and augmented secondary liner system over portions of the proposed expansion footprint, a secondary liner system, a leak detection system, a primary liner system, leachate collection and off-site treatment for liquid in contact with waste, landfill gas collection and control infrastructure, stormwater management, and a water quality monitoring network. Similar types of non-hazardous waste generated within the State, as currently placed in existing landfill cells, are proposed for the expansion, including CDD, FEPR, MSW incinerator ash, wood biomass ash, sludges, contaminated soil, OBW, MSW bypass, and other approved special wastes.

The proposed expansion will have direct impacts on 2.04 acres of freshwater wetlands. As stated in Finding 1(D) of this license, the applicant previously obtained a permit-by-rule for clearing of 0.1 acres of the critical terrestrial habitat associated with a significant vernal pool for construction of the fence and electrical line. The applicant also identified additional vernal pools subject to regulation by the U.S. Army Corps of Engineers. The applicant submitted a compensation plan consisting of a designated on-site preservation area of 266 total acres for impacts to both the wetlands regulated by the State and those regulated by the U.S. Army Corps of Engineers.

GENERAL SOLID WASTE PROVISIONS

4. HOST COMMUNITY AGREEMENTS AND MUNICIPAL INTERVENOR GRANTS

A. Host Community Agreement

State law at 38 M.R.S. § 2170-A requires that host community agreements be in place with all applicable communities prior to issuing a license to a solid waste disposal facility owned or operated by the State. Copies of the two host

community agreements with the City of Old Town and the Town of Alton were submitted with the application. The Host Community Compensation and Facility Oversight Agreement, dated December 8, 2005, was signed by the State of Maine, the City of Old Town and Casella Waste Systems, Inc. The Community Benefits Agreement, dated October 6, 2005, was signed by the State of Maine, the Town of Alton, and NEWSME Landfill Operations, LLC.

B. Municipal Intervenor Grants

The Department's rule at 06-096 C.M.R. ch. 400, § 7(B) establishes procedures for the use of funds by a municipality that has requested intervenor status, pursuant to 38 M.R.S. § 1310-S(4), for an expanded solid waste disposal facility proposed to be located in that municipality. A municipal intervenor may request financial assistance to pay for direct expenses associated with its substantive participation in the application review process.

The City of Old Town requested, and was automatically granted, intervenor status on June 4, 2015. The City of Old Town meets the eligibility requirements to receive financial grants to support participation in the licensing process. The Town of Alton notified the Department on July 30, 2015 that it would not be requesting intervenor status.

5. TITLE, RIGHT OR INTEREST

The applicant must demonstrate sufficient title, right, or interest in all of the property which is proposed for development or use pursuant to 06-096 C.M.R. ch. 400, § 4(A). The applicant has provided evidence of the State's title to the property pursuant to the Rules by submitting a copy of its warranty deed to the 780-acre parcel of land on which the proposed expansion will be located. The deed for the parcel is recorded in Book 9188, page 152 at the Penobscot County Registry of Deeds. A deeded right-of-way to the parcel from Route 16 is also recorded in the Registry. The Board therefore finds that the applicant has demonstrated sufficient title, right, or interest in the property proposed for the expansion.

6. FINANCIAL ABILITY AND FINANCIAL ASSURANCE

State law at 38 M.R.S. § 1310-N(2-F)(A) (siting standards) requires that the applicant have the financial ability to develop the project in a manner consistent with state environmental standards and the provisions of the statute. State law at 38 M.R.S. § 1310-Y requires the applicant to provide assurance of its financial ability to satisfy the estimated costs for corrective action and assurance of financial capacity to satisfy the estimated costs of closure and post closure care; however, 38 M.R.S. § 1310-Y applies to

privately owned solid waste facilities. The Department's rules at 06-096 C.M.R. ch. 400, § 4(B)(1) and § 11 require financial ability and financial assurance for the design, construction, operation, maintenance, closure and post-closure care of a proposed solid waste facility; however, as a State-owned facility the proposed expansion is not subject to the requirements of § 11 to provide financial assurance sufficient to ensure that funds are available to pay for the anticipated costs of compliance with all facility closure, post-closure maintenance, post-closure monitoring requirements, and corrective action.

Although not all of the financial requirements of the State laws and Rules apply to the State owned JRL, Casella maintains financial assurance as required by the OSA and as described below.

A. Financial Ability: Design, Construct, Operate, Maintain, Close, and Post-Closure Care

Permitting, design, construction, operation, and closure of JRL are funded by Casella, as set forth in the OSA with the State of Maine. Ongoing activities at JRL are funded by revenues generated from the operation of the landfill (i.e., tipping fees). The applicant provided a letter dated May 21, 2015 from the Bank of America, N.A. showing that Casella maintains a secured credit facility administered by that bank. The applicant represented that this letter demonstrates the ability of NEWSME and its ultimate parent company, Casella, to fund the expansion of JRL from working capital, if necessary.

Table 2 includes the opinion of expansion costs submitted by the applicant (Volume I of the application, Table 3-1, page 3-2). The application included an estimated cost of construction for the first cell of the expansion, Cell 11, of $6,240,000.

Table 2: Opinion of Expansion Costs

Activity	Estimated Cost ($)
Design and Permitting	$4,800,000
Construction	$19,800,000
Operations	$7,000,000
Closure	$12,400,000
Post-Closure Care	$8,700,000

Notes:
1. Design costs include MEDEP permit fees in 2015.
2. Construction costs are in 2015 dollars.
3. Operations costs represent estimated yearly costs.
4. Closure costs for the entire project in 2015 dollars at a per acre closure cost at $226,000 per acre.

5. Post-closure care includes costs to maintain and monitor the facility for the 30-year post-closure period in 2015 dollars based on a per-acre cost of $160,400 per acre.

The Board finds that financial ability is maintained by NEWSME as the current operator of JRL to design, operate, maintain, close, and accomplish post-closure care in a manner consistent with applicable State law and Rule requirements.

B. Financial Assurance

The applicant maintains a surety bond as financial assurance for final closure costs and post-closure care costs for the entire developed site for a 30-year period. Financial assurance is required by the OSA, Sections 13.7 and 21. A surety bond will be utilized as financial assurance for the proposed expansion, as well. The closure and post-closure care costs are updated yearly with updates of costs by an independent third party and the documentation of any changes made to the funding agreement submitted in the facility's Annual Report. The most recent updated surety bond documentation was submitted to the Department in an August 9, 2016 letter with attachments.

The Board finds that sufficient financial assurance is maintained by NEWSME as the current operator of JRL for closure and post-closure care, provided NEWSME submits the appropriate financial assurance package updates to the Department on an annual basis.

7. TECHNICAL ABILITY

The applicant must have the technical ability to develop the project in a manner consistent with State environmental standards in accordance with the 38 M.R.S. § 1310-N (2-F)(A) siting standards and must submit evidence that affirmatively demonstrates the technical ability to design, construct, operate, maintain, close, and accomplish post-closure care, as well as meeting civil or criminal record standards as stated in 06-096 C.M.R. ch. 400, § 4(C)(1).

A. Technical Experience

NEWSME has managed JRL since April 2004 and employs qualified management and staff at the facility, along with utilizing qualified consultants for design, construction, and operations. The application included position descriptions and responsibilities, along with resumes, of key personnel. NEWSME's parent company, Casella is also available to provide extensive

expertise in solid waste, recycling, and resource management. The specific consultants retained for the proposed expansion application include: SME of Cumberland, Maine as the primary consultant with expertise in geology, hydrogeology, and landfill design; Sanborn, Head & Associates, Inc. of Concord, New Hampshire for landfill gas design; Gorrill Palmer of Gray, Maine for traffic assessment; SMRT, Inc. of Portland, Maine for visual assessment; Epsilon Associates, Inc. of Maynard, Massachusetts for noise assessment; and Stantec Consulting Services, Inc. (Stantec) of Topsham, Maine for wetland and other natural resources assessments.

The Board finds that the combination of BGS staff, NEWSME operations and management personnel, and the consultants retained by the applicant have the technical ability to develop the proposed expansion in a manner consistent with the applicable State law and Rule requirements.

B. Civil or Criminal Record

Finding 23 of this license contains the information on civil and criminal disclosure.

8. PROVISIONS FOR TRAFFIC MOVEMENT

The applicant must make adequate provisions for safe and uncongested traffic movement of all types into, out of, and within the proposed solid waste facility as set forth in the 38 M.R.S. § 1310-N(2-F)(B) siting standards and in 06-096 C.M.R. ch. 400, § 4(D)(1).

The primary waste haul route to JRL utilizes the Interstate system, I-95, to the Route 16 Bennoch Road interchange (exit 199), then Route 16 West for 0.1 miles to JRL's site access road. This haul route is to remain unchanged. New internal roads required for the proposed expansion have been designed for continuous traffic flow to minimize danger to pedestrians or other vehicles. The site access and internal site roads are maintained by NEWSME, including winter plowing and summer dust control.

The applicant submitted a traffic assessment prepared by Gorrill Palmer, dated June 2015, to determine if traffic increase due to the expansion will be adequately accommodated. Based on 2014 weight scale records and turning movement volumes collected on September 30, 2014, it was determined that the 2014 peak design hour trip generation was 28 during the morning and 25 during the afternoon. The proposed expansion is expected to increase accepted waste tonnages to 700,000 tons annually from about 629,000 tons received in 2014, resulting in an estimated 31 and 28 truck round trips during the peak morning and afternoon hours, respectively. For the proposed expansion, the total daily vehicle trips generation is expected to be 203 (one way traffic, therefore,

approximately 101 total vehicles per day), of which 20 would be non-trucks and 183 would be various trucks with gross vehicle weights from 70,000 to 100,000 pounds. Gorrill Palmer noted that a disposal volume of approximately 700,000 tons was accepted in both 2010 and 2011.

For the proposed expansion, the primary 30-foot wide paved access road to the landfill will remain at its current location. Prior to a federal law change in 2011 which increased the allowable gross vehicle weight on I-95 from 80,000 to 100,000 pounds, vehicles over 80,000 pounds were required to use the state and local roadways. The weight limit change has reduced the traffic on local roadways by allowing trucks to utilize I-95. The applicant will encourage trucks to utilize the I-95 haul route when trucking waste to the proposed expansion.

In addition to addressing the existing and future traffic volumes and haul routes, the traffic assessment also looked at the future capacity of the facility, the Maine Department of Transportation (MDOT) accident inventory, sight distances, and internal access roads. The assessment concluded that the existing street system will continue to accommodate the vehicles associated with operation of the expansion.

During the course of the application review, traffic issues were raised by the City of Old Town regarding JRL related truck traffic on Bennoch Road (State Route 16). To address road conditions, BGS contacted MDOT concerning the possibility of improvements to the northern part of Bennoch Road. Preservation paving and highway rehabilitation work were added to MDOT's 2018 work plan. To encourage truck usage on I-95 rather than Bennoch Road, the facility has installed two signs that read "Trucks Please Use I-95". One sign is located just beyond the scale house, seen by drivers leaving the scales, and the other is located across from the landfill entrance, seen by drivers as they leave the facility. In addition, MDOT agreed to install two additional signs. At the hearing, the City of Old Town stated that their concerns regarding expansion truck traffic impacts have been addressed.

The Board finds that the applicant has demonstrated that the roads and intersections in the vicinity of JRL have the ability to safely and appropriately handle all of the traffic attributable to the proposed expansion into, out of, and within the facility pursuant to the applicable State law and Rule requirements. The Board further finds that the applicant will continue its policy of encouraging trucks to utilize I-95.

9. FITTING THE SOLID WASTE FACILITY HARMONIOUSLY INTO THE NATURAL ENVIRONMENT

In accordance with the 38 M.R.S. § 1310-N(2-F)(C) siting standards, the applicant must make adequate provisions for fitting the proposed solid waste facility harmoniously into

the existing natural environment. Pursuant to the requirements in 06-096 C.M.R. ch. 400, § 4(E)(1), JRL must have buffer strips of sufficient size and quality to adequately protect aquatic and wildlife habitat and the natural environment; and may not unreasonably adversely affect protected natural resources and rare, threatened and endangered plant and animal species. The buffer must be a minimum of 100 feet between the facility site and the listed locations and habitats, unless otherwise approved or required.

The applicant retained Stantec to identify and inventory the presence of wetlands; potential significant wildlife habitats, unusual natural areas; vernal pools; and rare, threatened, and endangered species on the proposed project site. A review of records and contact with the following agencies occurred: the Maine Department of Inland Fisheries and Wildlife, the Department of Agriculture, Conservation, and Forestry, the Department, and U.S. Fish and Wildlife Service. Field studies were performed to assess the potential presence of State or federally listed rare, threatened, and endangered species, along with the delineation of wetlands and waterbodies.

Stantec did not directly observe State or federally listed rare, threatened and endangered plant or wildlife species on site during the field work which took place in 2008-2009 and 2014-2015. However, two areas were identified at the facility for further review: the forested area on site which is located in the range of the northern long-eared bat and the northeast portion of the facility which is located in the National Oceanic Atmospheric Association's mapped critical habitat for Atlantic salmon.

The northern long-eared bat (Myotis septentrionalis) was listed as threatened effective May 4, 2015 with a 4d ruling by the U.S. Fish and Wildlife Service under the Endangered Species Act. Stantec conducted an acoustic bat survey during the nights of June 10 and 11, 2015 utilizing the current U.S. Fish and Wildlife Service guidelines and did not detect the presence of the northern long-eared bat.

Atlantic salmon are protected under the final 2009 ruling issued by the National Marine Fisheries Service and U.S. Fish and Wildlife Service under the Endangered Species Act. The expansion is proposed to be located approximately 800 feet from an unnamed intermittent brook, 950 feet from an unnamed tributary to Pushaw Stream and 2,350 feet from Judkins Brook. All of these streams are located in the watershed of the Penobscot River which contains Atlantic salmon. Isolated freshwater wetlands occur within the 780 acre facility parcel, including approximately two acres directly impacted by the proposed expansion; however, no delineated or mapped streams were identified within the proposed development area of the site. The Department of Marine Resources (DMR) stated that the proposed project should not cause any significant adverse impact to Atlantic salmon or other marine resources. The Maine Department of Inland Fisheries and Wildlife (MDIFW) stated that fisheries staff does not anticipate any adverse impacts on fisheries resources associated with this landfill expansion.

At the hearing, intervenor Edward Spencer's expert witness, Dr. Stephen Coghlan, questioned the applicant's conclusions regarding no expected impacts to Atlantic salmon. He testified on the life history and habitat requirements of Atlantic salmon and its sensitivity to various toxins, and argued that leachate generated by the project as well as impacts to the freshwater wetlands on-site have the potential to negatively impact its viability. He also argued that potential impacts to Atlantic sturgeon (federally-listed as threatened) and shortnose sturgeon (federally-listed as endangered) which are found in the lower Penobscot River Watershed should be considered. Dr. Coghlan testified that continued deforestation, urbanization and wetland alteration in the Penobscot River watershed have a detrimental impact on the habitat and viability of these endangered species as a result of increased runoff of nutrients and toxic chemicals. Dr. Coghlan also stated that in the event of a catastrophic breach of the liner system or a large storm event, leachate and/or stormwater runoff may contaminate adjacent waterways and ultimately the Penobscot River. Dr. Coghlan pointed out that in light of the success of the Penobscot River Restoration Trust's work on the Penobscot River that other important anadromous fish species have seen population increases recently and that the proposed expansion may put those species at risk again.

In response, Bryan Emerson, the applicant's wetland's expert, stated in his rebuttal testimony that the proposed expansion does not directly impact any river, stream or brook. The largest wetland being impacted in the middle of the proposed expansion is "an isolated forested wetland with no surface hydrological connection to a stream or floodplain wetlands, and the wetlands being impacted on the edge of the expansion are not floodplain wetlands. Therefore, no direct impacts to Atlantic salmon or their habitat are likely to occur." He further testified that Judkins Brook, which is within federally mapped Critical Habitat for Atlantic salmon, is located in a different watershed than the landfill expansion. With respect to Dr. Coghlan's concerns regarding potential impacts to Atlantic sturgeon and shortnose sturgeon in the Penobscot River, Mr. Emerson testified that Judkins Brook is located approximately 6.5 river miles upstream from the Stillwater River, and Pushaw Steam, more than 8.4 river miles. The Stillwater River then flows approximately 6 to 8 river miles before it reaches the mainstream of the Penobsot River, making it "highly unlikely" that there would be any adverse impacts to Atlantic sturgeon or shortnose sturgeon as a result of the JRL expansion.

Based on Stantec's evaluation results; the design of the landfill; the distance from the solid waste boundary to the intermittent and perennial streams; the fact that these streams do not contain habitat for Atlantic Salmon, Atlantic sturgeon, or shortnose sturgeon; and that the leachate is collected and treated at an off-site facility that has a waste discharge license from the Department, the Board finds the project will not have an unreasonable impact to Atlantic salmon, Atlantic sturgeon, or shortnose sturgeon.

The expansion will impact approximately 2.04 acres of primarily forested freshwater wetlands through direct filling and 0.1 acres of the critical terrestrial habitat of one significant vernal pool regulated under the Natural Resources Protection Act. The impacts to the significant vernal pool were authorized in a permit-by-rule that was accepted by the Department on July 29, 2015. Finding 38 of this license addresses impacts to freshwater wetlands and compliance with the Natural Resources Protection Act and associated rules.

In addition to the NRPA regulated wetlands, the applicant identified 14 vernal pools within and adjacent to the expansion area, 12 of which are regulated by the U.S. Army Corps of Engineers. Stantec prepared a Wetlands Compensation Plan to meet both NRPA and Corps requirements.

The MDIFW reviewed the proposed project and stated that, with the exception of one Significant Vernal Pool, there are no other essential or significant wildlife habitats at the project site.

The Board finds that the applicant has demonstrated that the facility will have sufficient buffers to adequately protect aquatic life and wildlife habitat and the natural environment; and that there will be no unreasonable adverse effects to protected natural resources and rare, threatened and endangered plant and animal species pursuant to 38 M.R.S. § 1310-N (2-F)(C) and 06-096 C.M.R. ch. 400, § 4(E)(1).

10. NO UNREASONABLE ADVERSE EFFECT ON EXISTING USES AND SCENIC CHARACTER

The solid waste facility may not unreasonably adversely affect exiting uses and scenic character as set forth in the 38 M.R.S. § 1310-N(2-F)(C) siting standards and in 06-096 C.M.R. ch. 400, § 4(F)(1), including consideration of bird hazard to aircraft, historical sites, established public viewing areas, excessive noise at the property boundary or at any protected location, or existing uses of neighboring property.

A. Bird Hazard to Aircraft

The proposed expansion is located over 13,000 feet from Dewitt Field Old Town Municipal Airport, the closest airfield. The Rules require a description of all airport runways within 10,000 feet of the facility.

Based on the distance to the airport, the Board finds that the expansion is not expected to present a bird hazard to aircraft.

B. Historical Site Preservation

In a letter dated January 15, 2015, from the Deputy State Historic Preservation Officer of the Maine Historic Preservation Commission, it was concluded that there would be no historic properties affected by the proposed expansion.

The Board finds that the proposed expansion will not unreasonably adversely affect historic properties.

C. Visual Assessment

A visual assessment dated July 2015 was prepared for the applicant by SMRT Inc. to evaluate whether the proposed expansion will unreasonably interfere with views from established public viewing areas. Public viewing area is defined in 06-096 C.M.R. ch. 400, § 1(Ll) as "an area designated for the public to view scenic areas, historical sites, unusual natural features or public monuments. These areas include but are not limited to scenic highways; public easements; scenic turnouts; public monuments; and national, state or municipal parks." The Rules require descriptions of protected locations and established public viewing areas within 2,000 feet of the proposed expansion.

The visual assessment included defining the existing site characteristics around the facility, quantification of the site viewshed, identification of public viewing areas, development of maps for line of site and viewsheds, and preparation of final landfill topography illustrations. Computer-generated modeling, weather balloons at strategic locations and elevations, field visits, and photography were used. To determine public viewing areas within 2,000 feet of the proposed expansion, stakeholders contacted by correspondence included Maine Bureau of Parks and Lands, MDOT, City of Old Town, the towns of Alton, Glenburn, Greenbush, Hudson, and Milford, and the Penobscot Nation. No public viewing areas were identified within 2,000 feet of the proposed expansion, but the study area was expanded to a 6-mile distance based on a question raised in a pre-submittal meeting regarding possible views from the western shore of Pushaw Lake and vicinity. The stakeholder process identified the following potential scenic resources within 6 miles of the proposed expansion: Pushaw Lake, Pushaw Stream, Penobscot River, Stillwater River, Hirundo Wildlife Refuge, Sunkhaze Meadows National Wildlife Refuge, Mud Pond (also known as Perch Pond) and the Perch Pond Recreational Trail, the Costigan Historical Cemetery, and the Penobscot River corridor at the public boat launch. Views were also considered from the following roadways: Route 16, I-95 Southbound, and Route 43.

The assessment performed using U.S. Forest Service standards and guidelines in 06-096 C.M.R. ch. 315 concluded that Pushaw Lake and the Penobscot and Stillwater Rivers had no significant scenic features reported or identified within the study area. The scenic resources within the study area were determined not to have views to the landfill or are considered background by the U.S. Forest Service as being 4 miles to the horizon. The area roadways were not defined as public viewing areas, scenic resources, or scenic byways. The views from Route 16 were considered intermittent, the distant view from I-95 includes broken line of sight by roadside vegetation, and Route 43 has a screening of plantings.

Views of the landfill will change during construction and operation. The operating landfill will generally be seen as grayish in color with equipment in sight. Prior to final closure, the landfill is proposed to be covered by a temporary black geomembrane, and at closure it will be fully planted with a vegetative layer and will resemble nearby hillsides with similar height, scale, and form.

The Board finds that the design of the proposed expansion takes into account the surroundings and when completed, capped, and vegetated, the expansion will not have an unreasonable adverse effect on the scenic character of the surrounding area as required pursuant to 38 M.R.S. § 1310-N(2-F)(C) siting standards and in 06-096 C.M.R. ch. 400, § 4(F)(1).

D. Noise

A Sound Level Assessment Report, dated July 2015, was prepared for the applicant by Epsilon Associates, Inc. to evaluate sound levels from the proposed expansion. The Rules include noise standards, as noise is considered unwanted sound and sound levels can be measured in decibels (dBA = decibels adjusted to reflect the ear's response to different frequency of sound). Table 3 includes the sound level limit standards of 06-096 C.M.R. ch. 400, § 4(F)(2).

Table 3: Sound Level Limit Standards

Sound Level Limit	**Applicable Hours** Daytime: 7:00 am to 7:00 pm Nighttime: 7:00 pm to 7:00 am	**Location**
75 dBA	Daytime and Nighttime	Facility property boundary
60 dBA	Daytime	Protected location zoned or usage not predominantly commercial or industrial (i.e., residential)
50 dBA	Nighttime	

The assessment included existing sound levels around the operating landfill and measurement of potential noise sources (operations and equipment), computer

modeling to predict future sound levels for various operating scenarios, and comparisons to the sound level limits. Sound levels from mobile equipment (excluding registered and inspected on-road vehicles), the Thiopaq® landfill gas treatment facility, and the anticipated future on site landfill gas-to-energy plant were included in the modeling. Operations for the proposed expansion were considered to be the same as current operations: 6:00 am to 6:00 pm Monday to Friday and 7:30 am to 2:30 pm Saturday and Sunday.

During periods of operations, modeled results were below the 75 dBA sound level limits for daytime and nighttime at the facility property boundary. However, residential areas are considered protected locations in the Rules and the western and northern property lines border residential properties. Additionally, there is a residential parcel to the south beyond the property boundary. These locations were assessed for compliance with the more restrictive sound level limits. The assessment results were below 60 dBA for the daytime operations, but were above 50 dBA for the one operating hour from 6:00 am to 7:00 am considered nighttime. To meet the sound level limit for this one hour of operation, the facility will be restricted to utilizing landfill equipment with a combined sound level of 77 dBA at 50 feet or less during the 6:00 am to 7:00 am hour when within 60 feet from the western solid waste boundary (approximately 480 feet from the western property line). This equates to utilizing a Caterpillar 836 compactor (77 dBA or less at 50 feet) or a Caterpillar 826 compactor (75 dBA or less at 50 feet), but not both compactors simultaneously.

The applicant will continue to maintain buffer vegetation between the proposed expansion and property lines to minimize sound levels from the facility, with the exception of tree clearing to install the relocated electrical line. The proposed pump stations, future gas-to-energy plant, and other mechanical structures will incorporate acoustical enclosures. Construction and maintenance activities will include environmental noise control devices in proper working condition and maintained as originally provided with the equipment by its manufacturer. Although vehicle warning signals and alarms are exempt from the sound limit levels, NEWSME has replaced the original backup alarms on operating equipment at the landfill with broadband backup alarms having less abrupt sounds.

The Board finds that the noise study for the proposed expansion indicates that routine operations will not generate excessive noise at the property boundary or at any protected location as defined by the Rules; provided that during the hour of 6:00 am to 7:00 am, only equipment with a combined sound level of 77 dBA at 50 feet or less are utilized if within 60 feet of the western solid waste boundary (approximately 480 feet from the western property line).

E. Neighboring Property

The portions of the 780-acre parcel to be developed will be a continuation of the existing site use, with buffers as required by 06-096 C.M.R. ch. 401, §§ 1(C)(2) and (3). Existing land in the vicinity of the expansion is locally zoned for landfilling, rural residences, farming, and under resource protection. The setbacks and buffers from the solid waste boundary in comparison to the Rule requirements are listed in Table 4 (modified from Volume I of the application, Table 3-3, page 3-12):

Table 4: Proposed Expansion Setback and Buffers

Setbacks from the Solid Waste Boundary to:	Actual Proposed (feet)	Rules Setback Requirements (feet)
Prohibitive Siting Criteria		
Class AA or Class SA Waters	> 10,560 (> 2 miles)	1,000
Significant sand and gravel aquifer	5,230 (approximately 1 mile)	300
Fault displaced in Holocene time	None identified on 780-acre parcel. Nearest mapped fault approximately 6 miles northeast of site.	200
Restrictive Siting Criteria		
Nearest public road	2,400	300
Property boundary	420	300
Nearest residence	2,100	1,000
Stratified sand and gravel deposit	275	100
Classified surface water	950	100
Water supply spring or water supply well not owned by the applicant	2,100	1,000

The Board finds that the proposed facility will have no unreasonable adverse effect on existing uses of property neighboring the proposed expansion based on the facility's buffers and setbacks as required in State law and the Rules.

11. NO UNREASONABLE ADVERSE EFFECT ON AIR QUALITY

The solid waste facility may not unreasonably adversely affect air quality pursuant to the siting standards of 38 M.R.S. § 1310-N(2-F)(C) and 06-096 C.M.R. ch. 400, § 4(G)(1). The facility must obtain an air emission license, if required; control fugitive dust and

nuisance odor; and prohibit open burning of solid waste other than clean or painted wood waste.

A. Air Emission License

Air emission license renewal #A-921-70-B-R was issued on October 7, 2014 for the existing landfill facility with findings that emissions from the source will receive Best Practical Treatment, will not violate applicable emissions standards, and will not violate applicable ambient air quality standards in conjunction with emissions from other sources. The air emission license renewal includes State and federal emission limits and operational requirements associated with landfill gas collection and control, as well as monitoring and reporting requirements.

The 2014 air emission license renewal addresses control of landfill gas emissions through use of a landfill gas collection and control system, with the extracted and collected landfill gas passing through a Thiopaq® sulfur removal system, then being combusted in either the main flare (Flare #4) or back-up flares prior to release to the atmosphere. In the future, a landfill gas-to-energy facility may be located at the site, at which time the extracted Thiopaq® treated gas may be combusted in engines to produce power as an alternative to flaring. The Thiopaq® system was required to be installed to decrease total reduced sulfur (mainly H_2S) prior to combustion to reduce sulfur dioxide air emissions. Thiopaq® operations began in early 2015, with a sulfur removal Sulfatreat® system installed as backup. In addition to monitoring air emissions from the control equipment, as well as control equipment parameters, the facility is also required by the Federal New Source Performance Standards (NSPS) to perform periodic gas surface scans on the landfill.

An LFG System Expansion Design Report, dated June 2015, was prepared by Sanborn, Head & Associates, Inc. for the proposed expansion consisting of estimates of future landfill gas generation, descriptions of the proposed gas collection and control system, and how the proposed system would connect to the existing gas collection system infrastructure. The report stated that Flare #4 is adequate for the proposed expansion. Flare #4 capacity and operations are addressed in the air emission license renewal.

The Board finds that the applicant has an air emission license, as required by State law and the Rules.

B. Fugitive Dust

The measures to control dust at the proposed expansion will include utilizing water spray trucks to wet secondary roads during dry weather, paving the primary access road to the proposed expansion, and making use of a road sweeper to remove dirt buildup on paved roadways. Calcium chloride may be utilized on an as-needed basis, primarily on internal cell access roads.

On the landfill's active working area, ash will be off-loaded and primarily utilized as a mix within daily cover or as a bulking agent for sludge. The ash will not be prone to being windblown due to quenching, which is to occur at the point of generation, and the placement of ash and ash mixtures on the active landfill area.

The Board finds that the dust control measures proposed by the applicant are sufficient to control fugitive dust as required by State law and the Rules.

C. Nuisance Odors and H_2S

Three potential primary sources of odor identified by the applicant were odors associated with incoming wastes, leachate storage and transport, and landfill related gases. The facility's Odor Complaint Management and Response Plan to manage landfill-related odors and limit off-site odor migration is part of the facility's current Operations Manual. Incoming waste types with the highest potential for odor generation are FEPR, MSW bypass, and wastewater treatment plant sludge. The leachate has potential for odor during storage at the facility and transport to the wastewater treatment facility. Landfill gases, including odorous H_2S, are produced as the waste in the landfill decomposes.

Measures for minimization of odor associated with incoming odorous waste streams will include placement within a small area in the cell, waste compaction, and placement of another lift (or layer) of non-odorous waste such as ash or CDD waste above it. Daily cover will be applied over the active portion of the landfill at the end of each day of waste placement. The facility will also utilize odor neutralizing spray systems, as needed, such as a bulldozer mounted system within the active cell, a trailer spray system for incoming and outgoing trailer loads, and a perimeter misting system.

To minimize leachate odors, the leachate will be collected and transported by piping systems and stored in an enclosed tank sized to hold all of the leachate generated at the landfill prior to being transported for treatment and disposal. Tanker trucks used to haul the leachate to the wastewater treatment facility will be

required to have their tanker filling points tightly sealed during transportation and have the ability to add chemicals for odor reduction.

Odor from LFG produced as waste degradation occurs will be minimized by the installation of intermediate or final cover over non-active portions of the landfill and the operation of the facility's LFG collection and control system, which will be expanded to accommodate the proposed expansion.

The facility monitors H_2S concentrations through real-time data collected using six Honeywell Analytics Single Point Monitors, four located off-site (on the access road, West Coiley Road, Route 43, and Old Stagecoach Road), and two located on-site, one adjacent to the perimeter fence and one on NEWSME owned land on Route 16. The location and operation of the four off-site monitors have been pre-determined with the Department's approval. The two on-site monitors are solely utilized to assist in operations, and the location and operation of these monitors may change or cease based on ongoing operations. If the monitors detect concentrations of 15 parts per billion (ppb) or above at any of the off-site monitors, the scale house is alerted by automated telephone message. Personnel then report any alert to supervisory staff for follow-up. In addition to monitoring for compliance with the action level of 15 ppb, the monitor data can be utilized in assisting with odor complaints.

Odor complaints received by the facility will follow a specific procedure. Information will be obtained from the complainant and then given to the appropriate complaint response personnel. Follow-up steps will be taken during the complaint investigation including filling out a Complaint Record Form with data about the day, time, wind direction and speed, H_2S levels, unusual conditions at the landfill, and observed waste materials accepted at the time of complaint. Landfill personnel will communicate directly with the complainant, either in person or by phone. For all complaints, the following will also be documented: remedial actions taken, resolution of the complaint, comments made during the investigation, and any other recommendations.

During the licensing proceedings, the City of Old Town raised the issue of H_2S as it relates to odor and exposure. The City's consultant and expert witness, Denis St. Peter, P.E. of CES, Inc., recommended that the facility use acute action levels for concentrations of H_2S exceeding 15 ppb (for reporting of events in the facility's Monthly Status Report) and 30 ppb, with the Old Town Code Enforcement Officer to be contacted if H_2S levels exceed 30 ppb. The applicant agreed and has incorporated the action levels into the facility's Operations Manual. Mr. St. Peter also recommended that the City set forth its own evaluation protocol to review the effect of possible chronic (long-term) exposure

to H_2S on members of the public since JRL does not currently use a chronic exposure standard. A portion of the Host Community funding will be used to hire a consultant to annually review the facility's H_2S data, with the City reporting the findings to the applicant and the Department.

Intervenor Edward Spencer testified on the odor complaint procedure and suggested consideration be made to include law enforcement officials in the process to verify nuisance odors. In response to this concern, Jeremy Labbe, P.E., Environmental Manager at JRL, testified that the City of Old Town receives a summary of every odor complaint at JRL and that JRL can provide copies of individual completed complaint forms to the City if requested. Mr. Labbe further testified that any City employee or citizen may call in an odor complaint.

The Board finds that the applicant has proposed odor control mechanisms sufficient to control nuisance odors from the proposed expansion as required by State law and the Rules. The Board further finds that the facility's current odor complaint procedure includes appropriate documentation and follow-up to odor complaints at this time.

12. NO UNREASONABLE ADVERSE EFFECT ON SURFACE WATER QUALITY

In accordance with the 38 M.R.S. § 1310-N(2-F)(C) siting standards of no unreasonable adverse effect on water quality and the requirements of 06-096 C.M.R. ch. 400, § 4(H)(1), the solid waste facility: may not discharge any water pollutants, directly or indirectly, that affect the state classification of a surface water body, as specified in 38 M.R.S. § 464; may not discharge any pollutant without first obtaining a license pursuant to 38 M.R.S. § 413 (waste discharge licenses); may not degrade water quality by contributing to the phosphorous concentrations in "waterbodies most at risk from new development" as defined in *Direct Watersheds of Lakes Most at Risk from New Development, and Urban Impaired Streams,* 06-096 C.M.R. ch. 502 (last amended December 27, 2006); and may not cause the discharge of a nonpoint source of pollution to waters of the United States that violates any requirement of an area-wide or State-wide water quality management plan that has been approved in compliance with Section 319 of the *Federal Water Pollution Control Act*, as amended.

The proposed expansion includes a leachate collection and off-site treatment system for precipitation that comes into contact with waste and stormwater management and erosion sedimentation control plans to control surface water runoff from covered portions of the facility, construction activities, and non-operational areas. The proposed expansion is not located within the watershed of a "lake at most risk from new development" or an "urban impaired stream." The applicant submitted a Stormwater Management Plan and an Erosion Sedimentation Control Plan, both dated July 2015 and prepared by SME. The

plans address effective drainage, flood prevention, and erosion control. The applicant's best management practices include stormwater detention basins, low velocity (lined) ditches, and stone check dams within on-site ditches. The plans are described in more detail in Findings 14 and 17 of this license.

The facility holds a Multi-Sector General Stormwater Permit (#MER05B477) for the discharge of stormwater associated with industrial activity for Sector L: landfills. The facility also submitted the existing Stormwater Pollution Prevention Plan, originally prepared in April 2006 and most recently revised in June 2013. The Stormwater Pollution Prevention Plan will be updated as necessary to address construction as the proposed expansion is developed.

Leachate generated by the proposed expansion will be collected, stored onsite, and trucked off-site to the MFGR, LLC wastewater treatment plant in Old Town. The project was reviewed by the Department's Bureau of Water Quality, which stated that the treatment plant is licensed to accept the leachate and is currently operating in compliance with that license (Department Order #W-002226-5O-O-R, entered into the evidentiary record). Leachate management is described in more detail in Findings 26(D) and 28(E) of this license.

The Board finds that the stormwater and leachate management systems for the proposed expansion meet the applicable State laws and Rules and are designed to prevent the discharge of sediment and other contaminants conveyed by stormwater from polluting the waters of the State and otherwise unreasonably affecting surface water quality.

13. NO UNREASONABLE ADVERSE EFFECT ON OTHER NATURAL RESOURCES

The solid waste facility may not unreasonably adversely affect other natural resources in the municipality or in neighboring municipalities pursuant to the 38 M.R.S. § 1310-N(2-F)(C) siting standards and 06-096 C.M.R. ch. 400, § 4(I)(1). The facility must conform to the standards of NRPA, 38 M.R.S. §§ 480-A to 480-Z, if proposed to be located in, on, over, or adjacent to a protected natural resource; and must be permitted by the federal government for any activities that require a Federal Wetlands permit.

Finding 38 of this license addresses impacts to protected natural resources under the NRPA and includes the Board's findings regarding compliance with NRPA requirements. The applicant has applied to the U.S. Army Corps of Engineers for a permit for impacts to federally regulated wetlands located in and adjacent to the expansion area.

14. SOIL TYPES THAT ARE SUITABLE AND WILL NOT CAUSE UNREASONABLE EROSION

In accordance with 38 M.R.S. § 1310-N(2-F)(D) siting standards and 06-096 C.M.R. ch. 400, § 4(J)(1), the solid waste facility must be located on soil types suitable to the nature of the undertaking and the facility must not cause unreasonable erosion of soil or sediment.

An Erosion and Sediment Control Plan, dated July 2015 and prepared by SME, was submitted with the application to address the site setting including watersheds, wooded areas, and surficial soils; existing and proposed drainage structures, timing and sequence of land disturbance activities during cell construction, landfill operations, and cover placement; temporary, permanent, and standard erosion control measures; and maintenance and inspection of erosion control features to ensure proper function. In addition, a site assessment report was submitted with the application consisting of site investigation findings and site characteristics, along with other analyses.

The surficial soils were investigated with the use of site test pits and soil borings and through the use of the Natural Resources Conservation Service Web Soil Survey of Penobscot County, Maine 2014. The surficial soils under and around the proposed expansion footprint are primarily Plaisted very stony loam and Howland very stony loam. On-site observations and a review of soils mapping did not identify areas near the proposed expansion that would be prone to or highly susceptible to erosion, such as exposed sideslopes.

The design and implementation of all erosion control measures will follow the requirements of the Rules and will be in accordance with the appropriate version of Maine's Erosion and Sediment Control Best Management Practices (BMP) Manual, most recently updated in March 2015 for Contractors and in October 2016 for Designers and Engineers (the previous version was dated 2003). BMP's to minimize erosion from the proposed expansion will include utilizing grass lined and riprap lined channels, catch basins, sediment detention ponds, culverts, ditches, storm drains, riprap aprons, riprap plunge pools, and level spreaders. Analyses were performed to appropriately size and locate these structures. Some existing structures will be utilized as they exist without modifications and others will be modified or removed. For example, Detention Ponds 1 and 9 will be modified, Detention Pond 5 will be removed, Detention Ponds 2 and 6 will remain unmodified, and Detention Ponds 10, 11, and 12 will be added.

Prior to disturbance of soil during development, appropriate erosion and sedimentation control measures will be put in place. Temporary measures will include silt fences, temporary seeding, mulching, and stone check dams. Permanent measures will include downspouts, sedimentation ponds, permanent seeding, mulching, and culvert inlet and

outlet protection. The amount of area disturbed at any one time will be minimized by the phased development of the landfill over time.

The Board finds that the construction and operation of the proposed expansion will not cause unreasonable sedimentation or erosion of soil and that suitable soil types underlie the landfill, meeting the applicable State laws and Rules; provided that the erosion and sedimentation control plan is implemented as proposed, incorporating any future revisions as a result of the Department's review and approval of each new cell construction as detailed in a specific design package as phased landfill development occurs.

15. NO UNREASONABLE RISK THAT A DISCHARGE TO A SIGNIFICANT GROUND WATER AQUIFER WILL OCCUR

Pursuant to 38 M.R.S. § 1310-N(2-A), the 38 M.R.S. § 1310-N(2-F)(E) siting standards, and 06-096 C.M.R. ch. 400, § 4(K)(1), the proposed solid waste facility may not: overlie any significant sand and gravel aquifers; pose an unreasonable threat to the quality of a significant sand and gravel aquifer; pose an unreasonable threat to the quality of an underlying fractured bedrock aquifer; or pose an unreasonable risk that a discharge to a significant ground water aquifer will occur. Significant ground water aquifer is defined in 06-096 C.M.R. ch. 400, §§ 1(Ccc) as "a porous formation of ice contact and glacial outwash sand and gravel supplies or fractured bedrock that contains significant recoverable quantities of water likely to provide drinking water supplies", with a similar definition found in 38 M.R.S. § 1310-N(2-A).

The application included a comprehensive Site Assessment Report dated July 2015, prepared by SME, of the geologic and hydrogeologic characteristics of the site, in addition to the water quality of the site, future water quality monitoring, and travel time analyses.

The Maine Geological Survey maps (Open File 08-87, Tolman and Lanctot, 2008) show the nearest mapped sand and gravel aquifer in the vicinity of the proposed expansion is approximately one mile east of the landfill. There are no stratified sand and gravel deposits mapped by the Maine Geological Survey within the facility site (Borns and Thomspson, 1981; Foster and Smith, 2001). Therefore, the proposed expansion does not overlie any significant sand and gravel aquifers.

An investigation was performed to determine whether the proposed expansion would pose a risk or affect the quality of a significant sand and gravel aquifer or a bedrock aquifer. Although no mapped stratified sand and gravel deposits are located near the proposed expansion and ground water from bedrock beneath, directly adjacent to, and immediately downgradient of the proposed site is not likely to be used for domestic

consumption due to the State's ownership of land 400 feet downgradient of the proposed solid waste boundary, two formations were evaluated further. These formations consist of the isolated stratified sand zones contained within the basal till greater than 100 feet beyond the southeast side of the proposed expansion boundary and the off-site bedrock immediately adjacent to the site property boundary.

The on-site stratified sand and off-site bedrock formations were evaluated utilizing the time of travel analysis and the contaminant transport analysis included in the application. These analyses are described in more detail in Findings 25 and 29 of this license, respectively.

The Board finds that the proposed expansion will not be located over a significant sand and gravel aquifer and that the facility poses no unreasonable risk to a significant sand and gravel aquifer or underlying fractured bedrock aquifer, as required by State law and the Rules. Adequate protection of water quality will be provided by the soils under the proposed expansion, the design of the proposed expansion, the ground water flow conditions, and implementation of the Water Quality Monitoring Program discussed further in Finding 33 of this license.

16. ADEQUATE PROVISION FOR UTILITIES AND NO UNREASONABLE ADVERSE EFFECT ON EXISTING OR PROPOSED UTILITIES

The applicant shall provide for adequate utilities, including adequate water supplies and appropriate sanitary wastewater disposal, and the facility may not have an unreasonable adverse effect on existing or proposed utilities in the municipality or area served by those utilities, in accordance with the 38 M.R.S. § 1310-N(2-F)(F) siting standards and in 06-096 C.M.R. ch. 400, § 4(L)(1).

Existing sanitary wastewater disposal systems located at the maintenance buildings (on the southeast side of the facility) and the office building and scale house (currently located on the north side of the facility) will continue to be utilized by personnel. However, with the development of Cell 12, the office building and scale house will be relocated northeast from its current position and a well and new on-site sanitary wastewater disposal system will be installed.

Water for dust control, leachate pipe cleaning, and other needs of the facility will continue to be met by the existing on-site water supply sources. The leachate generated by the landfill will continue to be collected and stored on-site and treated off-site.

As part of the proposed expansion, an approximate 3,700-foot portion of the facility's three-phase, 480-volt power electrical service will be relocated. This electrical service enters the site along the existing access roadway which will be modified to accommodate

the development of the proposed expansion. The new leachate pump stations associated with the proposed expansion will require three-phase, 480-volt power, which will be supplied to each pump station through additional on-site electrical cables to be installed along the site access roads.

The Board finds that the applicant has provided for adequate utilities and the proposed facility will not have an unreasonable adverse effect on existing or proposed utilities in the municipality or area served by the utilities, pursuant to the applicable State law and Rules.

17. NOT UNREASONABLY CAUSE OR INCREASE FLOODING

The solid waste facility may not unreasonably cause or increase flooding on-site or on adjacent properties nor create an unreasonable flood hazard to a structure pursuant to the 38 M.R.S. § 1310-N(2-F)(G) siting standards. As set forth in 06-096 C.M.R. ch. 400, § 4(M)(1), the facility may not be located in a 100-year flood plain or restrict the flow of a 100-year flood. In addition, the facility must include a stormwater management system that controls run-on and run-off; and infiltrates, detains, or retains precipitation falling on the facility site during a storm of an intensity up to and including a 25-year, 24-hour storm, such that the rate of flow of stormwater from the facility after construction does not exceed the rate of outflow of stormwater from the facility site prior to the construction of the facility.

The most recent Federal Emergency Management Agency (FEMA) flood plain map of the proposed expansion's location shows that the proposed expansion is not located on a 100-year flood plain (Quad panel number 2301120002A, dated April 1978).

The Stormwater Management Plan prepared by SME and dated July 2015 for the proposed expansion application included pre-and post- development stormwater analyses, for storm events up to and including a 25-year, 24-hour storm event. The post-development design includes modifications to some of the existing stormwater structures, along with the addition of three detention ponds and various drainage ditches, catch basin, storm drains, and culverts. The stormwater analyses showed that post-development peak flows did not exceed pre-development peak flows. The results of the submitted analyses are shown in Table 5 (Volume I of the application, Appendix J, Table 4-1, page 9). Changes in precipitation data, requirements, or cell development plans may result in revisions to the analyses as the proposed expansion is developed.

Table 5: Summary of Peak Flows

Analysis Point	Peak Flow (cubic feet per second, cfs)					
	Pre-Development			Post-Development		
	2-Year	10-Year	25-Year	2-Year	10-Year	25-Year
1	29.5	92.6	130.9	16.2	50.4	68.3
2	10.2	26.6	36.0	9.8	24.6	33.2
3	29.1	74.1	100.3	29.1	74.1	100.3
4	36.1	92.1	124.5	33.4	84.7	112.5
5	6.2	14.6	19.3	5.7	13.4	17.7

Note: Peak flow of analysis point after routing through the detention pond and/or reaches.

Dr. Stephen Coghlan, Intervenor Spencer's expert witness, raised concerns in pre-filed direct testimony on the date of the 1978 flood plain map used by the applicant. Department staff verified through a website search of FEMA's floodplain maps that the most recent map for the proposed expansion area was utilized, as required. Dr. Coghlan also testified on the potential for extreme rainfall events and flooding due to climatic changes and questioned the adequacy of an analysis based upon a 25-year, 24-hour storm event. Michael Booth, P.E. of SME, one of the applicant's expert witnesses, testified that the rules require that an event of intensity up to and including a 25-year, 24-hour storm be utilized in the analysis. In addition, Mr. Booth testified that the stormwater ponds include structures that also allow stormwater flow from a 100-year storm to be managed without impacting the integrity of the structures and that with respect to the age of the flood plain maps, the expansion is located on a high point and not susceptible to flooding.

The Board finds that the facility will not be located in a 100-year flood plain and that adherence to the facility's stormwater management plan will control run-on and run-off; and will infiltrate, detain, or retain water falling on the facility site during a storm of an intensity up to and including a 25-year, 24-hour storm, such that post-development stormwater flows from the facility are below pre-development stormwater flows from the facility site. These findings meet the applicable requirements of State law and the Rules.

18. SOLID WASTE MANAGEMENT HIERARCHY

A. Applicable Law

As stated in 38 M.R.S. § 1310-N(1)(D) and 06-096 C.M.R. ch. 400, § 4(N)(1), the purpose and practices of the solid waste facility must be consistent with the State's solid waste management hierarchy (hierarchy) set forth in 38 M.R.S. § 2101(1), which reads as follows:

> Priorities. It is the policy of the State to plan for and implement an integrated approach to solid waste management for solid waste generated in the State and solid waste imported into this State, which must be based on the following order of priority:
>
> A. Reduction of waste generated at the source, including both amount and toxicity of the waste;
> B. Reuse of waste;
> C. Recycling of waste;
> D. Composting of biodegradable waste;
> E. Waste processing that reduces the volume of waste needing land disposal; including incineration; and
> F. Land disposal of waste.

For the purpose of 06-096 C.M.R. ch. 400, § 4(N):

> reducing, reusing, recycling, composting and/or processing waste to the "maximum extent practicable" prior to disposal means handling the greatest amount of waste possible through means as high on the solid waste management hierarchy as possible, resulting in maximizing waste diversion and minimizing the amount of waste disposed, without causing unreasonable increases in facility operating costs or unreasonable impacts on other aspects of the facility's operation. Determination of the "maximum extent practicable" includes consideration of the availability and cost of technologies and services, transportation and handling logistics, and overall costs that may be associated with various waste handling methods.

In addition, 38 M.R.S. § 2101(2) establishes that "it is the policy of the State to actively promote and encourage waste reduction measures from all sources and maximize waste diversion efforts by encouraging new and expanded uses of solid waste generated in the State as a resource."

The Department's rule at 06-096 C.M.R. ch. 400, § 4(N)(2)(a) states that for a solid waste disposal facility, the applicant must affirmatively demonstrate consistency with the hierarchy, including the following:

> that the waste has been reduced, reused, recycled, composted, and/or processed to the maximum extent practicable prior to incineration or landfilling, in order to maximize the amount of material recycled and reused, and to minimize the amount of waste

> being disposed. Such evidence shall include, but is not limited to, a description of the reduction, reuse, recycling, composting and/or processing programs/efforts that the waste is or will be subject to, and that are sufficiently within the control of the applicant to manage or facilitate, including relevant metrics to evaluate effectiveness; and a description of ongoing efforts to increase the effectiveness of these programs/efforts.

State law also imposes limits on the origin of wastes accepted at a State-owned solid waste facility. In accordance with 38 M.R.S. § 1310-N(11),

> a solid waste facility owned by the State may not be licensed to accept waste that is not waste generated within the State. For the purposes of this subsection, "waste generated within the State" includes residue and bypass generated by incineration, processing and recycling facilities within the State or waste, whether generated within the State or outside of the State, if it is used for daily cover, frost protection or stability or is generated within 30 miles of the solid waste disposal facility.

B. Applicant's Summary of Proposed Waste Streams Relative to the Hierarchy

In its application (Volume I) and the testimony of Toni King, P.E., Regional Engineer for Casella Waste Systems, Inc.'s Eastern Region, the applicant provided information, summarized below, on the wastes proposed to be disposed in the expansion and the viable waste management options for these wastes as related to the hierarchy that are sufficiently within the control of the applicant to manage or facilitate:

(1) *CDD* – JRL has received, and is expected to continue to receive in the expansion, CDD from Casella-owned companies and others. Typically, about 30% of the material disposed of at JRL is CDD. In 2014, Casella-owned companies delivered approximately 87,324 tons of CDD material to JRL. Approximately 3,335 tons of clean wood and metals had been removed from this material and JRL has a wood waste handing area which received 46 tons of clean wood and stumps in 2014. These materials were ground and recycled as alternative daily landfill cover. Additionally, Casella controlled/operated transfer stations divert tonnage from JRL, including clean and processed wood and metal, which is removed from the CDD before the CDD is sent to JRL. These Casella facilities also direct or supply CDD to processing facilities such as ReEnergy in Lewiston for beneficial use or recycling.

(2) *FEPR* – FEPR currently comes to JRL from the PERC incinerator in Orrington. PERC's FEPR is approximately 20% by weight of the non-combustible portion of the facility's MSW that cannot be incinerated and is removed mechanically prior to combustion of the refuse-derived fuel. FEPR is currently utilized at JRL as part of the 5-foot layer, referred to as the "soft layer", which is placed above the landfill liner and leachate collection systems as a protective layer. This usage is also proposed for the expansion. At this time, there is no other disposal option allowed in Maine other than secure landfill disposal for FEPR. The applicant states that if FEPR were not available, the facility would need to purchase other materials such as tire chips and sand to provide a soft layer.

(3) *MSW Incinerator Ash and Multi-Fuel Boiler Ash* – The use or reuse of MSW incinerator ash is currently not allowed by regulatory beneficial use standards in Maine due to its chemical characteristics; therefore, the current disposal method is landfilling. Multi-fuel boiler ash is similar to MSW incinerator ash regarding the allowable disposal method, with the exception of a few ashes, such as clean wood ash. Clean wood ash may be land spread or used in the production of flowable fill for certain construction needs. Casella Organics, NEWSME's sister company, has developed, and continues to develop, programs to reuse and recycle suitable clean wood ash, diverting various amounts from the landfill. JRL will utilize ash in its operations as daily cover at the proposed expansion, eliminating the need to use virgin soil (non-waste material) to serve that purpose.

(4) *CDD Processing Fines* – The residue from the processing of CDD is currently utilized as landfill grading, shaping, and alternative daily cover material and is expected to be used in the same manner for the proposed expansion. The current allowable disposal methods for CDD processing fines are either reuse as daily cover or disposal in secure landfills. Use of CDD fines as alternative daily cover materials at landfills is a beneficial use/recycling activity. Approximately 126,000 tons of CDD fines were received at JRL in 2014 and used as alternative daily cover.

(5) *OBW* – OBW is not currently generated by entities within the control of BGS and NEWSME, and there are no prevalent, viable mechanisms for reuse, reduction, or recycling of OBW that are within the control of BGS and NEWSME. The primary management option is landfill disposal for OBW.

(6) *Municipal Wastewater Treatment Plant Sludge* – Municipal wastewater treatment plant sludge not land applied, composted, or alternatively managed is proposed as acceptable waste at the expansion. Casella Organics has developed, and continues to develop, alternative sludge usage programs; however, the usage options for municipal wastewater treatment plant sludge from Maine communities is limited due to factors such as the quality of sludge, available acres for land application, facility capacity restrictions and cost considerations. Landfilling is the disposal option for municipal wastewater treatment plant sludge not otherwise land applied, composted or alternatively managed.

(7) *Industrial Wastewater Treatment Plant Sludge and Residuals* – As with municipal wastewater treatment plant sludge, industrial wastewater treatment plant sludge and residuals are expected to be disposed of in the proposed expansion. Maine industries with wastewater or process treatment plants (the generator of this type of sludge) are responsible for reducing and recycling this waste material to the maximum extent practicable. As stated above, Casella Organics has an active alternative sludge usage program to divert some of this waste material from the landfill; however, the sludge not otherwise processed is landfilled. For example, in 2014 Casella Organics handled approximately 42,000 tons of short paper fiber from the Cascades Auburn Fiber pulp mill in Auburn, Maine, all but 8000 tons of which was diverted from disposal to beneficial uses.

(8) *Contaminated Soils and Oil Spill Debris* – Contaminated soils and oil spill debris are currently accepted at JRL at an estimated amount of about 1% of the total tonnage (approximately 6,500 tons in 2014) and are expected to be accepted in the proposed expansion. This waste type often is the result of accidental spills and releases and is managed in accordance with regulated practices (such as facility spill prevention, control, and countermeasure plans). While some of these wastes can be used in construction projects or in secure settings, reuse is typically limited due to physical and/or chemical characteristics or practical limitations such as transportation costs. Alternate use decisions are within the control of the generator, not BGS or NEWSME.

(9) *Miscellaneous Special Wastes* – Generators of miscellaneous special wastes are responsible for reducing to the maximum practicable extent the amount of these wastes that are landfilled. These special waste streams are handled either through individual one-time or ongoing special waste permits when there is not an alternative to landfilling based on regulatory

standards and practical cost and transportation considerations. Alternative use decisions are within the control of the generator, not BGS or NEWSME.

(10) *MSW Bypass from Maine MSW Incinerators* – The only MSW that will be disposed of in the JRL expansion is bypass from Maine MSW incinerators (pre-filed testimony by Ms. King page 10; pre-filed testimony by Jeremy Labbe, Environmental Manager at JRL, page 13; hearing testimony by Michael Barden, the State's Manager for State-owned landfills, pages 15 and 147 of the hearing transcript; and during questioning of Intervenor Edward Spencer page 419 of the hearing transcript). These incinerators are required by their licenses to provide an alternative management method (bypass) if the facility receives MSW that is in excess of its ability to accept, process, and/or combust that waste (i.e., during planned shutdowns or unplanned production problems). The decision to bypass and where to dispose of the bypass is made by the incinerator facility and is not within the control of BGS or NEWSME.

C. Testimony Regarding the Hierarchy

Compliance with the State's solid waste management hierarchy was a major issue at the hearing.

The applicant testified that the proposed expansion will be developed and operated consistent with the hierarchy and that JRL will promote and encourage waste reduction measures and maximize the waste diversion efforts of JRL users to the maximum extent practicable. Toni King, Regional Engineer for Casella Waste Systems, Inc.'s Eastern Region, testified that a high percentage of material to be disposed of in the proposed expansion is ranked in the State Plan (Maine Materials Management Plan: 2014 State Waste Management and Recycling Plan Update & 2012 Waste Generation and Disposal Capacity Report, January 2014, prepared by the Maine Department of Environmental Protection) as either a high or medium option for landfill disposal; i.e., landfill disposal is the primary management technique available (high) or a middle option (medium). Ms. King testified that approximately 30% of the waste material accepted at JRL is utilized in landfill operations and is considered recycling in accordance with the applicable State laws and Rules. This includes residuals from waste processing facilities used as alternative daily cover, thereby offsetting the amount of landfill capacity used by non-waste materials. Ms. King noted in her testimony that the Department evaluated JRL's use of alternative daily cover as part of the Public Benefit Determination for the proposed expansion and concluded that the amount

used at JRL is comparable to the amount used at the Crossroads landfill in Norridgewock, Maine.

Ms. King also testified that NEWSME's parent company operates Casella Recycling, LLC and Casella Organics, both of which contribute to the reduction of waste landfilled. Casella Recycling, LLC, a Zero-Sort facility in Lewiston, recycled approximately 87,700 tons of material in 2014 and the non-recyclable residuals (9% of the waste stream) were sent to the Mid Maine Waste Action Committee (MMWAC) incinerator in Auburn, with ecomaine in Portland available as backup. Casella Organics composts and land applies organic wastes, landfilling their customers' waste only when the physical or chemical properties of the material do not allow for beneficial reuse, if there is a lack of site access for land application, or when reuse/recycling outlets are not available.

Intervenor Edward Spencer addressed the following issues in his testimony and post-hearing brief: a concern that wastes have been coming into JRL without adequate assurance of source reduction; wastes sent to JRL should have been handled according to the State's hierarchy at their source, their point of discard, including wastes discarded outside of Maine and subsequently sent to Maine processing facilities; the definition of "waste generated within the State" is concerning since CDD processing facilities can accept out-of-state wastes but once processed, those wastes (fines, OBW, etc.) are considered in-state waste; and as a state-owned landfill, the focus should be on preserving capacity by exerting more control over the waste accepted for disposal.

With respect to CDD and associated residuals, Mr. Spencer testified that for the last five years (2011 through 2015) wastes categorized as CDD, OBW, and CDD process fines when combined accounted for over 57% of inputs to JRL. Mr. Spencer expressed concern over the origin of CDD ultimately disposed of at JRL, and testified that the majority of wastes entering the Lewiston processing facility (ReEnergy) and "continuing to JRL" were not discarded in Maine. Mr. Spencer expressed concern about the amount of OBW in the CDD, and questioned the amount of effort that goes into recycling various components of OBW such as mattresses, appliances, and furniture. Mr. Spencer argued in support of an annual limit on the amount of OBW disposed of at JRL and for waste audits of processing facilities as set forth in the Public Benefit Determination for the proposed expansion.

Intervenor Dana Snowman raised similar concerns regarding the amount and origin of wastes coming to JRL and the statutory definition of "waste generated within the State" in his questioning of the applicant's witnesses.

In response to these concerns, Michael Barden, the State's Manager for State-owned landfills, testified that out-of-state wastes are "excluded wastes" and disposal at JRL is prohibited, and he affirmed that JRL accepts only waste which meets the definition of "waste generated within the State."

Ms. King further testified that discussion of the "point of discard" is irrelevant; the State's solid waste rules do not require evidence of the point of origin. With respect to CDD and associated residuals, Ms. King testified that CDD processing facilities in Maine must demonstrate that they are complying with Maine State law "by recycling or processing into fuel for combustion all wastes accepted at the facility to the maximum extent practicable, but in no case at a rate of less than 50%." Ms. King testified that two processing facilities cited by Mr. Spencer, ReEnergy in Lewiston and ARC in Eliot, reported recycling rates in 2015 of 78.7% and 84%, respectively, (BGS/NEWSME Exhibits #49 and #50), and have met their statutory recycling and source reduction requirements. Therefore, residuals, including CDD fines and OBW, from these facilities are legally "waste generated within the State" and may be accepted at JRL.

Ms. King testified that the question for the applicant is whether the applicant could further reduce, reuse, compost, or incinerate the post-processing CDD material that JRL receives from these processing facilities. Her response was that it could not; she testified that the fines are used as alternative daily cover (a use which is defined as recycling), the primary option for handling of OBW is landfilling, and that these materials cannot be further reduced, incinerated or composted.

With respect to mattresses, a component of OBW, Ms. King testified that Casella has had limited experience with mattress recycling at other facilities in New England, but that by the time mattresses arrive at JRL, they are in poor condition (fabric contaminated, wood broken) and are not easily recycled.

Ms. King testified that waste streams entering JRL are, and will continue to be, managed consistent with the hierarchy to the extent within the applicant's control and to the maximum extent practicable, and that the hierarchy does not require a solid waste facility to control those who generate waste.

D. Board Finding

The Board finds that Casella-owned facilities have active recycling and reuse programs that divert waste from JRL. In addition, the waste management options available for most of the materials proposed to be disposed of in the landfill expansion, as set forth in the State Plan, are at or near the bottom of the hierarchy.

The concern that OBW from CDD processing facilities are landfilled without limitation is addressed by the establishment of an OBW limit for the proposed expansion in Finding 37 of this license. Compliance with the recycling and source reduction provisions of State law is further addressed in Finding 19 of this license.

With respect to intervenors Edward Spencer and Dana Snowman's argument that generators located outside Maine should be subject to Maine's laws governing recycling and source reduction, the Board finds that under current law, provided the Maine solid waste processing facilities which accept waste from outside Maine are in compliance with the terms of their licenses and State law regarding recycling, residue and bypass generated by these Maine facilities' operations sent to JRL is "waste generated within the State" and may be disposed of in the proposed JRL expansion.

The Board further finds that the applicant's purpose and practices of the proposed expansion are consistent with the applicable State laws and Rules relating to the hierarchy; provided that evolving waste management techniques and practices sufficiently within the control of the applicant continue to be explored and implemented as appropriate to reduce, reuse, recycle, compost, and/or process to the maximum extent practicable prior to landfilling. In each Annual Report, the applicant must summarize the steps taken by the facility in the respective reporting year to meet the hierarchy, submitting relevant metrics to evaluate effectiveness (i.e., tons of material diverted from landfill disposal by Casella companies; tons of materials reused, reduced, recycled at the landfill), a description of ongoing efforts to increase the effectiveness of these programs/efforts, and any additional pertinent hierarchy-related information.

19. RECYCLING

In addition to demonstrating compliance with the State's solid waste management hierarchy as described in Finding 18 of this license, State law at 38 M.R.S. § 1310-N(5-A) requires the applicant to demonstrate that the proposed solid waste disposal facility will accept solid waste that is subject to recycling and source reduction programs, voluntary or otherwise, at least as effective as those in the statute and other provisions of State law; and the applicant has shown consistency with the recycling provisions of the State Plan. Similarly, 06-096 C.M.R. ch. 400, § 6(B) requires a determination by the Department that the volume of the waste and the risks related to its handling and disposal have been reduced to the maximum practical extent by recycling and source reduction prior to being landfilled or incinerated, consistent with state recycling programs and the State Plan.

The applicant submitted the information presented in Table 6 below (Volume I of the application, Table 5-1, page 5-2 and BGS/NEWSME Pre-filed Direct Testimony Exhibit #4 appended to the testimony of Toni King) to address opportunities for recycling of the waste streams proposed to be accepted for disposal in the proposed expansion. The applicant testified that the tonnages of the various waste types in the table were estimated for design purposes and were not intended to be limits on the amounts received.

Table 6: Waste Management Techniques for Proposed Expansion Materials

Material Category	Proposed Waste Types to be Accepted in Expansion		Is Material a Residual from a Processing Facility that reduced the amount of material landfilled?	Is Material subject to recycling efforts by generator or otherwise prior to landfilling or is its use in the landfill considered recycling?	State Plan[1] Ranking of Landfill Disposal as Current Management Method	State Plan[1] Ranking for Source Reduction, Recycle, Compost, Beneficial Reuse Processing As Current Management Method
	Tons	Percentage of Total Tonnage				
Waste Treatment Plant Sludges and Biosolids	70,000	10	No	Yes	L	H,L,N,N/A
Contaminated Soils	30,000	4.3	No	Yes	H	N/A,N
Municipal Solid Waste Incinerator Ash	58,000	8.3	Yes	No	H	N/A
Front-End Processing Residue[2]	54,000	7.6	Yes	No	H	N/A
Biomass and Fossil Fuel Combustion Ash	35,000	5	Yes	Yes	M/H	N/A,M
Construction and Demolition Debris	195,000	27.9	No	Yes	H,M	N/A,N, M
Construction and Demolition Debris Processing Facility Fines	138,000	19.7	Yes	Yes	N/E	N/E
Oversized Bulky Waste	60,000	8.6	No	No	H	L

Material Category	Proposed Waste Types to be Accepted in Expansion		Is Material a Residual from a Processing Facility that reduced the amount of material landfilled?	Is Material subject to recycling efforts by generator or otherwise prior to landfilling or is its use in the landfill considered recycling?	State Plan[1] Ranking of Landfill Disposal as Current Management Method	State Plan[1] Ranking for Source Reduction, Recycle, Compost, Beneficial Reuse Processing As Current Management Method
	Tons	Percentage of Total Tonnage				
Miscellaneous special waste	35,000	5	No	No	M,H	N/A,N,M
MSW Bypass and Soft Layer Material[3]	25,000	3.6	Yes	Yes	M, H	N, N/A
Total[4]	**700,000**	**100**	**44.2**	**70.5**		

Notes: [1] Source: MEDEP Maine Materials Management Plan, January 2014, Appendix C Current Management of Maine's Solid Waste by Type; N=None L=Low; M=Medium; H=High; N/A = Not Applicable (not possible); N/E Not Evaluated.
[2] Listed as shredder residuals.
[3] Note included in Table as an individual category compared to MSW Other Organics.
[4] Values are percent of total material landfilled except tons total.

The applicant also presented evidence on Casella's efforts to facilitate recycling of a number of other waste streams and thereby decrease the volume of wastes landfilled including Casella Recycling's Zero-Sort system used by Maine municipalities (which recycles paper, cardboard, plastic, glass and metals) and Casella Recycling's offer of waste audits to commercial and industrial customers to assist with the recycling of difficult to recycle items (Pre-filed direct testimony of Ms. King).

A summary of testimony at the hearing regarding recycling and source reduction and the hierarchy, and the applicant's responses, are summarized in Finding 18 of this license.

As shown in Table 6, it is expected that 44.2% of waste disposed will be residuals (MSW incinerator ash, 8.3%; FEPR, 7.6%; Biomass and fossil fuel combustion ash, 5.0%; CDD processing fines, 19.7%; and MSW bypass, 3.6%) from processing facilities that already reduce the amount of materials landfilled. Approximately 70.5% of the waste disposed will be materials (waste treatment plant sludges and biosolids, 10%; contaminated soils, 4.3%; biomass and fossil fuel combustion ash, 5.0%; CDD, 27.9%; CDD processing fines, 19.7%; and MSW bypass, 3.6%) subject to recycling at its source or are considered recycling based upon the landfill's use.

While the percentages in the table may vary with actual operations, a review of the data indicates that overall the facility follows the State Plan ranking for recycling. A high percentage of material to be disposed of is ranked in the State Plan as either a high or medium option for landfill disposal; i.e., landfill disposal is the primary management technique available (high) or a middle option (medium). The only low landfill disposal ranked material that will be accepted at JRL includes waste treatment plant sludges and biosolids. Casella Organics, a subsidiary of NEWSME's parent company Casella, does actively compost and reuse this material at the Hawk Ridge Compost Facility in Unity, Maine. The record indicates that in 2014, 29,068 tons of waste water treatment plant sludges and biosolids were manufactured into compost and mulches, while 38,000 tons were brought to JRL for disposal (Volume I of the application, page 5-3).

The Board finds that the applicant has demonstrated that material proposed to be landfilled in the JRL expansion has been reduced to the maximum practical extent by recycling and source reduction prior to being landfilled in accordance with applicable State law and Rules provided the facility's Annual Report includes updates on recycling information similar to that in Table 6 for the waste disposed, as specified by the Department.

20. PUBLIC BENEFIT DETERMINATION

Pursuant to the provisions of 38 M.R.S. § 1310-AA and in accordance with 06-096 C.M.R. ch. 400, § 5, proposals for new or expanded solid waste disposal facilities must be found by the Commissioner to provide a substantial public benefit.

As stated in Finding 1(B)(7) of this license, the applicant originally proposed to expand JRL by 21.9 million cubic yards. The Commissioner issued a PBD approval, with conditions, for a 9.35 million cubic yard capacity increase of JRL on January 31, 2012. On appeal, the Board affirmed the Commissioner's PBD in a decision dated July 19, 2012. Pursuant to 38 M.R.S. §1310-N(3-A)(B), the Commissioner's determination of public benefit is not subject to review by the Board as part of this licensing process.

In the PBD, the Commissioner concluded that the proposed expansion will provide a substantial public benefit, provided the expansion is limited to 9.35 million cubic yards, and provided an annual limit on OBW disposal in the expansion is established. The approval included the following conditions (among others):

3. The applicant shall, if, and when, a license is issued for the construction and operation of the 9.35 million cubic yard expansion, comply with the limit, and any subsequent modifications to the limit, established by the Department in the license on the tonnage of OBW that may be disposed in the 9.35 million cubic yard expansion.

4. Periodic independent third party audits of CDD processing operations that are anticipated to transport more than 10,000 tons of OBW to the 9.35 million cubic yard expansion for disposal on an annual basis shall be conducted to verify the results of the demonstrations required under the provisions of 06-096 [C.M.R. ch. 409, § (2)(C)], focused on the nature and volume of processing residues being sent to JRL for disposal. Third party audits will be conducted by a qualified consultant selected by the Department in consultation with the affected CDD processing facilities and Casella. Casella shall reimburse the Department for the cost of the audits. The first such audit(s) shall occur prior to the disposal of OBW from these processing facilities in the 9.35 million cubic yard expansion. Audits will be conducted at 2 year intervals, unless or until the Department approves their discontinuation.

These conditions of the PBD are included in the conditions of this license. See Finding 37 of this license for further discussion of a limitation on the annual amount of OBW that may be accepted at JRL.

21. HAZARDOUS AND SPECIAL WASTE HANDLING AND EXCLUSION PLAN

Pursuant to 06-096 C.M.R. ch. 400, § 9(A), only permitted wastes may be accepted for handling at a solid waste facility; the operator shall comply with all applicable Federal and State laws regarding the detection, identification, handling, storage, transportation and disposal of special wastes, biomedical wastes and hazardous wastes; and the operator shall develop and implement a Hazardous and Special Waste Handling and Exclusion Plan for the detection, identification, handling, storage, transportation and disposal of any and all wastes that may be delivered to the facility.

Consistent with JRL's current license, only non-hazardous waste will be allowed to be accepted in the proposed expansion. The types of acceptable wastes for disposal are further described in Finding 37 of this license. Included in the facility's Operations Manual is a Hazardous and Special Waste Handling and Exclusion Plan which will apply to the waste delivered to the proposed expansion. This plan includes provisions for waste inspection at the gate and at the point of offloading, as well as procedures to follow if non-acceptable waste does enter the site.

Based upon the information provided by the applicant, the Board finds that the facility will not be licensed to accept hazardous waste and has an appropriate Hazardous and Special Waste Handling and Exclusion Plan for the detection, identification, handling, storage, transportation and disposal of delivered wastes. The Hazardous and Special

Waste Handling and Exclusion Plan will be updated as necessary with the annual review and revision of the facility's Operations Manual.

22. LIABILITY INSURANCE

The Department's rule at 06-096 C.M.R. ch. 400, § 10 requires a solid waste disposal facility, except public entities, to submit proof of liability insurance for the active life and closure of the solid waste disposal facility. The applicant is a public entity and is exempt from the liability insurance requirements of 06-096 C.M.R. ch. 400, § 10. Liability insurance is required by the OSA, Section 21. NEWSME submitted the current certificate of insurance maintained for the facility and NEWSME will provide copies of the updates to the current certificate of insurance in the facility's Annual Report during operation of the proposed expansion.

The Board finds that the applicant is exempt from the liability insurance requirements of 06-096 C.M.R. ch. 400, § 10 of the Rules; however, liability assurance is being maintained by NEWSME as the current operator of JRL and will be maintained for the expansion.

23. CRIMINAL OR CIVIL RECORD

In accordance with 38 M.R.S. § 1310-N(7) and 06-096 C.M.R. ch. 400, § 12, a license for a solid waste facility or activity may be denied if the owner or the operator or any person having a legal interest in the applicant or the facility has been convicted of any criminal law or adjudicated or otherwise found to have committed any civil violation of environmental laws or rules of the State, other states, the United States, or another country.

Civil and criminal disclosure statements were submitted for the BGS and NEWSME as part of the application. The disclosure statements included those for NEWSME's operation of JRL, a related entity New England Waste Services of ME, Inc. (operator of the Pine Tree Landfill), and the five officers, directors, and partners of the two businesses. Additionally, in response to the Department's review and comment on the application, the applicant submitted an organizational chart of the Casella companies authorized to do business in Maine.

In the five year environmental compliance history submitted for New England Waste Services of ME, Inc., four notices of violations and one administrative order were listed. These have been addressed through responses required by the notices of violation and administrative order.

Based upon information in the application, the Board finds that the applicant filed complete disclosure statements as required by applicable State law and Rule. Based on the disclosure statements submitted and the evaluation criteria contained in 06-096 C.M.R. ch. 400, § 12(B), the Board finds no basis for denying the license.

24. VARIANCES

Pursuant to 06-096 C.M.R. ch. 400, § 13, an applicant may seek a variance to the requirements of the Rules for establishing, altering, operating or closing a solid waste facility or handling solid waste provided the applicant demonstrates that its proposal will comply with the intent of State laws and the Rules.

The applicant requested no variances from the Rules for siting, design, or operation of the proposed expansion. The applicant submitted two variance requests related to construction practices regarding the maximum barrier soil lift thickness required by the Rules. In lieu of the variance requests, Department staff commented that the alternative design process required by 06-096 C.M.R. ch. 401, § 2(E) should be used to clearly and convincingly demonstrate the technical equivalency of the proposed alternative (see Department technical memorandum dated January 20, 2016 from S. Farrar, V. Eleftheriou, and K. Libbey). The alternative design standard procedure was agreed to by the applicant and is addressed in Finding 27 of this license.

SOLID WASTE SITING, DESIGN, AND OPERATION

25. SITE ASSESSMENT: GEOLOGIC AND HYDROGEOLOGIC

In accordance with 06-096 C.M.R. ch. 401, § 2(B) and (C), an applicant must submit the results of site investigations and assessments performed to properly describe the surficial stratigraphy and bedrock beneath and adjacent to the proposed solid waste boundary; ground and surface water investigations performed to determine water table information and horizontal and vertical ground water flow gradients and for phreatic surface (water table) observations; and geotechnical investigations to support the stability and settlement assessments. The applicant submitted a Site Assessment Report dated July 2015 prepared by SME (Volume II of the application). The applicant must demonstrate the proposed expansion meets the performance standards and siting criteria in 06-096 C.M.R. ch. 401, § 1(C).

Department staff reviewed the geological and hydrogeological aspects of the proposed expansion prior to the hearing and submitted comments to the applicant in several memoranda. The applicant addressed a number of the staff's comments and made a number of adjustments to the application in response to those comments.

A. General Site Geology Description

Information submitted by the applicant shows that the site of the proposed expansion is in an area underlain by glacial till, on an elongated hill oriented in a northwest-southeast direction understood to have been formed as a glacial drumlin. Dense, silt-clay glacial till is primarily beneath the proposed expansion, with occasional thin, isolated portions of washed till observed typically just above the bedrock. Marine clay was observed over till beyond the proposed expansion boundary. The glacial till ranges from less than 5 feet to greater than 50 feet thick beneath the proposed expansion footprint (average thickness between the landfill base grades and bedrock surface is an estimated 24.5 feet), with approximately 3.6 acres of the footprint having an existing overburden thickness of less than 5 feet. The near-surface till was determined to be fractured above the frost/desiccation zone due to weathering and frost action.

Bedrock beneath the proposed expansion is mapped as interbedded metamorphosed quartzite, siltstone, graywacke, and phyllite of the Vassalboro Formation (Maine Geological Survey mapping, Griffen, 1979a, Osberg et al, 1985), with no bedrock faults mapped within the site. Core samples were primarily metagraywacke and phyllite, with some metasiltstone. Four bedrock outcroppings were observed directly adjacent to the proposed expansion with fracture groupings oriented northwest/southeast and northeast/southwest. The bedrock is only slightly broken, weathered, and stained within the upper several feet, but is generally hard, unweathered, and competent with depth.

Hydraulic conductivities were measured during previous JRL investigations, with the following results: brown and gray glacial tills ranged from 1.8×10^{-5} to 2.4×10^{-8} centimeters per second (cm/sec); discontinuous washed till and sandy zones within the basal till had a geometric mean of 5.3×10^{-4} cm/sec; and bedrock ranged from 3.2×10^{-3} to 9.2×10^{-8} cm/sec.

Based upon the information in the application and supporting documents in the record, the Board finds that the applicant characterized the site geology in accordance with the requirements of 06-096 C.M.R. ch. 401, § 2(B)(1).

B. General Site Ground and Surface Water Description

The application includes information showing that the total 780-acre parcel is divided into four watersheds which drain to the east, northwest, northeast, and southwest. There is a relatively shallow water table from approximately 5 to 10 feet beneath much of the facility property due to the relatively low hydraulic conductivities of the natural soils and bedrock; therefore, the ground water flow

generally follows the topography and is expected to flow from the higher elevations towards the west and east following the drumlin as a ground water divide. Recharge at the higher topographical elevations occurs primarily through precipitation and snowmelt, with ground water moving mainly horizontally and discharging to locations along streams and low-lying topography. Upward vertical seepage gradients are located on the east and west lower portion of the drumlin beyond the proposed expansion footprint.

There are no stratified sand and gravel deposits mapped by the Maine Geological Survey within the landfill site. Further discussion of standards related to significant ground water aquifer can be found in Finding 15 of this license.

Based upon the information in the record, the Board finds that the applicant characterized the site hydrogeology in accordance with the requirements of 06-096 C.M.R. ch. 401, § 2(B)(2).

C. Site Investigations and Proposed Expansion Area Specifics

The applicant submitted data and summaries of site-specific investigations conducted within and around the proposed expansion area from 2004 to the present, including:

(1) Wetlands delineation within 2,000 feet of the proposed expansion footprint;

(2) Subsurface test pits and borings to sample and evaluate soil and bedrock lithologies;

(3) Bedrock coring for mapping, fracture frequency measurement, and porosity estimation;

(4) Surficial geophysical surveys using electrical earth resistivity and Very Low Frequency-Electromagnetic (VLF-EM) methods to identify bedrock fracture zones and other features;

(5) Borehole geophysical logging to identify and quantitatively characterize bedrock fracture orientation and structural features;

(6) Installation of multi-level piezometer clusters and monitoring wells to determine seasonal ground water flow rates and direction;

(7) In-situ hydraulic conductivity testing in monitoring wells and piezometers for both till and bedrock;

(8) Testing of soil properties;

(9) Laboratory hydraulic conductivity testing of undisturbed till samples for vertical hydraulic conductivity;

(10) Natural gradient ground water tracer tests to measure ground water velocities in till and bedrock;

(11) Ground water age-dating for ground water velocity verification;

(12) Bedrock pumping tests for fracture interconnectivity; and

(13) Water quality testing of the natural background ground water.

The information collected, specific methods used, and the results of the evaluations were included in the application. The results of the evaluations were utilized to confirm the site characteristics and in the design of the proposed expansion.

The water table (ground water phreatic surface depth) was found to vary between 0 and 2 feet below the existing ground surface during the wet season, whereas the dry season water table varies between 5 and 10 feet beneath the existing ground surface. Due to the shallow water table depth, the northeast side of the proposed expansion will be subject to upward ground water seepage into the construction excavations; therefore, the applicant will install an underdrain in the 12.7-acre area. It is expected that the seepage into the underdrain will continue, but then will eventually diminish since there will be less recharge once the area is covered, first by the liner systems, and eventually by a final cover system.

Information provided by the applicant shows that the fine-grained glacial till can be considered to provide some natural containment under the proposed expansion. The applicant used a variety of hydrogeological methods to estimate the horizontal ground water velocities. The calculated ground water velocities ranged from 1 to 24 feet per year (ft/yr) through the till. The natural gradient tracer test revealed a range of horizontal ground water velocities of about 10 to 24 ft/yr for the near surface weathered till. Subsequent estimates of travel time to sensitive receptors incorporated conservative estimates of horizontal ground water velocities.

Ground water movement through the bedrock under the proposed expansion is a function of the overall interconnectivity of the bedrock's fracture and joint openings. Based on pumping tests, bedrock tracer tests, and other investigative methods, the applicant concluded that the degree of bedrock fracture interconnectivity beneath the proposed expansion allows for a level of predictability of ground water movement through the site's bedrock and could be utilized for controlling ground water flow directions by means of ground water extraction wells if a leachate leak were to occur. The applicant's estimates of site-wide horizontal bedrock ground water velocities range from about 0.4 to 10 feet per day. Based on its ground water modeling, the applicant estimated that post-construction ground water flow directions beneath the proposed expansion are projected to be in a generally southerly direction.

Over the course of the review and comment period on the application, Department staff requested the collection of supplemental data from three additional boreholes at suggested locations within the proposed expansion footprint, and the geophysical downhole logging of those boreholes and the two water supply wells serving the office and scale house. The applicant conducted the requested drilling and geophysical downhole logging and submitted the results of the data collected in a report to the Department on June 7, 2016.

During its review of the application, Department staff raised several questions regarding the interpretation of the pumping test data and resulting ground water level drawdowns. The applicant responded to the Department's questions through additional correspondence, resulting in a Department memorandum dated June 21, 2016 from R. Behr stating that the Department's concerns have been addressed.

In his testimony and cross-examination, intervenor Edward Spencer posed questions regarding the site geology, including the impact of glacial rebound on landfill stability, the use of an underdrain system below ground water level, and potential ground water flow beyond the site. One of the applicant's expert witnesses, John Sevee, P.E., C.G., testified that glacial rebounding will have no effect on the integrity of the landfill or the slope of the drainage pipes since the crustal rebound is occurring over the entire region surrounding the landfill. Michael Booth, expert witness for the applicant, testified that the underdrain system was primarily designed to facilitate construction and will be monitored as part of the water quality monitoring program. Mr. Sevee testified that ground water flow paths were investigated through wells and borings, along with utilizing ground water simulations which indicated that ground water emanating from the landfill site does not pass to ground water users along Route 16, Route 43, or Stagecoach Road.

Based upon the information in the record, the Board finds that the applicant has submitted a site assessment report and subsequent information addressing Department staff's review comments, identified the site characteristics and recommendations for landfill design and construction, identified potential impacted sensitive receptors, and estimated ground water flow time of travel as required by 06-096 C.M.R. ch. 401, §§ 2(B) and (C). See Finding 33 of this license for further discussion regarding the Water Quality Report and Ground Water Monitoring Program.

The Board further finds that the underdrain system was included and designed specifically to minimize ground water intrusion during construction and that, in the future, the ground water level will flatten due to less recharge once the proposed liner system is placed. Addressing the concern of ground water flow beyond the site, the Board finds that extensive site assessments have been undertaken and submitted in the past and with this application to characterize the geology and hydrogeology at the site and to serve as the basis for the selection of the design of the proposed expansion.

D. Geotechnical Investigation

The applicant submitted the results of its geotechnical investigations as part of the site assessment. Based on the information provided by the applicant in the site investigations, including published data, on-site field and laboratory data, and specific seismic information, the Board finds that the applicant gathered sufficient information to support the stability and settlement assessments described in Findings 28A and B of this license, as required by 06-096 C.M.R. ch. 401, § 2(B)(3).

E. Time of Travel Calculations

The applicant submitted a time of travel analysis to demonstrate conformance with the Rule's performance standard of greater than 6 years from the bottom of the landfill to sensitive receptors and greater than 3 years from leachate storage structures and pump stations to sensitive receptors set forth in 06-096 C.M.R. ch. 401, § 1(C)(1)(c). Improvement allowances for the leak detection system and a composite secondary liner system were included in the calculations as described in Finding 26B of this license. An imported soil layer of 12 inches of compacted, low permeability, marine clay to be placed below the secondary liner system in the proposed expansion area was also taken into account in the calculations as allowed in 06-096 C.M.R. ch. 401, § 2(C)(2), based on the use of improvement allowances and the hydraulic conductivity and effective porosity of the marine

clay. The analysis included time of travel from each of the proposed expansion cells and the two proposed permanent leachate sumps. The applicant did not include the existing leachate storage tank in its calculations because it was previously addressed in license #S-020700-WD-N-A, dated April 9, 2004.

The sensitive receptors were selected based on the requirements in the Rules and site-specific characteristics and are listed in Table 7 (Volume II of the application, Table 7-1, page 7-6).

Table 7: Identified Site Sensitive Receptors

Identification	Location Description
Point A	Southeast sandy zone
Point B	Hypothetical Groundwater Supply Well at Closest Property Boundary on Eastern Side.
Point C	Surface Water Discharge to the East. An Unnamed tributary to Judkins Brook.
Point D	Surface Water Discharge to the Southwest. An Unnamed Tributary to Pushaw Stream.
Point E	Hypothetical Groundwater Supply Well at Closest Northern Corner of Property Boundary on Western Side.
Point F	Hypothetical Groundwater Supply Well at Closest Southern Corner of Property Boundary on Western Side.
Point G	Surface Water Discharge to the Northwest. An Unnamed Tributary to Pushaw Stream.

The applicant provided results of the time of travel calculations as shown in Table 8 (based on combining two tables in the application, Volume II, Tables 7-3 and 7-4 on page 7-11, and the applicant's update in the second response to comments dated May 13, 2016, with added footnotes for clarity). The analysis was performed twice: under current conditions and under future conditions when the ground water table flattens due to the cutoff of precipitation recharge when the area is covered (first by the liner system, then eventually by the final cover system).

Table 8: Calculated Travel Times to Site Sensitive Receptors

Landfill Node	Site Sensitive Receptor	Offset Credits[1] (yrs)	Imported Soils[2] (yrs)	Existing Conditions		Future Conditions		Rule Require-ment (yrs)
				Calculated Travel Time in Soil and Bedrock (yrs)	Total Travel Time (yrs)	Calculated Travel Time in Soil and Bedrock (yrs)	Total Travel Time (yrs)	
Cell 11 Southern End	Point A	3	3	10.5	**16.5**	10.5	**16.5**	**6**
Cell 11 Center	Point B	2	3	3.9	**8.9**	3.9	**8.9**	**6**

Landfill Node	Site Sensitive Receptor	Offset Credits[1] (yrs)	Imported Soils[2] (yrs)	Existing Conditions		Future Conditions		Rule Require-ment (yrs)
				Calculated Travel Time in Soil and Bedrock (yrs)	Total Travel Time (yrs)	Calculated Travel Time in Soil and Bedrock (yrs)	Total Travel Time (yrs)	
Cell 12 Center	Point C	2	3	11.3	**16.3**	11.4	**16.4**	**6**
Cell 13 Center	Point C	2	3	11.0	**16.0**	11.2	**16.2**	**6**
Cell 13 Leachate Sump	Point C	2	3	35.8	**40.8**	36.1	**41.1**	**3**
Cell 14 Center	Point D	3	3	47.7	**53.7**	62.2	**68.2**	**6**
Cell 14 Center	Point E	3	3	3.3	**9.3**	17.7	**23.7**	**6**
Cell 15 Center	Point F	2	3	1.2	**6.2**	1.4	**6.4**	**6**
Cell 16 Center	Point G	2	3	4.7	**9.7**	5.3	**10.3**	**6**
Cell 16 Leachate Sump	Point G	3	3	10.3	**16.3**	10.3	**16.3**	**3**

Notes: [1] Improvement allowance offset credits are described in Finding 26B of this license.
[2] 06-096 C.M.R. ch. 401, § 2(C)(2) allows for imported soils used for base preparation below liner systems to account for up to three years in the time of travel calculations, as appropriate.

Intervenor Edward Spencer testified that time of travel calculations appear to be an acknowledgement that a landfill leak will occur. Michael Booth, an expert witness for the applicant, testified that the time of travel analysis is required by the Rules and is utilized as a design evaluation tool.

Based on the information in the record, the Board finds that the applicant meets the Rule requirements of ground water time of travel from the bottom of the landfill liner systems (greater than 6 years) and leachate storage structures and pump stations (greater than 3 years) to all identified sensitive receptors. The applicant installed piezometers and water table observation wells at a sufficient number of locations to enable a calculation of ground water time of travel and performed the calculations with the appropriate information in accordance with the Rules.

26. DESIGN STANDARDS: ENGINEERING

The Department's rule at 06-096 C.M.R. ch. 401, § 2(D) requires an engineering design for a proposed landfill to meet specific design and performance standards. The applicant submitted engineering design information in support of the proposed expansion. As noted previously, a number of rounds of comments and responses occurred between Department staff and the applicant on the technical aspects of the proposed expansion design.

In general, the applicant's design of the proposed expansion consists of an underdrain and augmented secondary liner system over portions of the proposed expansion footprint, two liner systems (primary and secondary), a leak detection system, leachate and gas collection and control systems, and intermediate and final cover systems. The outer side slopes are designed at 3H:1V (3 horizontal to 1 vertical), with a maximum final elevation of 390 feet above mean sea level. Six operational cells are proposed. The applicant submitted a detailed engineering design including drawings, contract administrative documents, technical specifications and a construction quality assurance plan for Cell 11 with the application. Similar detailed engineering designs are required to be submitted for Department review and approval prior to each subsequent cell's construction.

A. Liner System Requirements

The liner system proposed for the expansion includes a composite primary liner, a leak detection system, and a secondary liner system. The proposed liner system consists of the following from top to bottom:

(1) A composite primary liner system consisting of an 80-mil HDPE textured geomembrane, a GCL, and a 12-inch compacted clay layer (hydraulic conductivity less than or equal to $1x10^{-7}$ cm/sec);

(2) A leak detection system consisting of a 12-inch layer of sand (average hydraulic conductivity greater than or equal to $1x10^{-2}$ cm/sec and a minimum hydraulic conductivity of $5x10^{-3}$ cm/sec), a network of 6-inch diameter perforated HDPE pipe, and a drainage geocomposite; and

(3) A secondary liner system consisting of a 60-mil HDPE textured geomembrane. The secondary liner system will be augmented with a GCL and 12 inches of compacted clay (hydraulic conductivity less than or equal to $1x10^{-7}$ cm/sec) on approximately 11 acres where the existing soil depth between the bedrock and landfill base grades is less than 10 feet.

Intervenor Edward Spencer voiced concerns in his testimony that the liner systems will eventually leak. In response, Michael Booth, expert witness for the applicant, countered the claim that all liner systems must necessarily leak, focusing on the following proposed expansion items: the expansion primary and secondary liner system was specifically designed to address potential leak issues, the construction process will include an electrical leak location survey of the primary geomembrane, the specifications for the geomembranes require compliance with ASTM standards (including stress cracking standards), construction specifications and practices will mitigate pressure points beneath the geomembrane that could lead to stress cracks, and the proposed expansion design eliminates liner penetrations for piping.

The Board finds that the liner system proposed by the applicant was designed in accordance with 06-096 C.M.R ch. 401, § 2(D)(1). The Board also finds that the proposed HDPE geomembranes for both the primary and secondary liner systems are thicker than the 60-mil and 40-mil Rule requirements, respectively. The Board finds that the geomembranes, GCLs, drainage geocomposites, and soils proposed will meet the performance requirements of the Rules, including material characteristics (i.e., Geosynthetic Research Institute standards and American Society for Testing and Materials (ASTM) standards) and installation requirements. Further, the applicant will be required to submit detailed design packages including the engineering design, drawings, contract administrative documents, technical specifications and a construction quality assurance plan to the Department for review and approval prior to the construction of each cell.

B. Improvement Allowance System (Time of Travel)

The Department's rule at 06-096 C.M.R. ch. 401, § 2(D)(2) allows for the use of improvement allowance offsets when calculating existing ground water time of travel to achieve the minimum 6 year time of travel to sensitive receptors.

The applicant incorporated improvement allowance offsets in the time of travel demonstration. Finding 25(E) of this license includes additional time of travel information.

The Board finds that the applicant utilized the allowance offsets appropriately as permitted by the Rules for the following two design improvements: a two year offset for the addition and monitoring of a leak detection system and geomembrane secondary liner for the areas of the proposed expansion where the design is applied; and a three year offset for the addition of a composite liner system (secondary liner augmented by a GCL) and leak detection system for the

areas where the bottom of the secondary liner system and the bedrock surface is generally less than 10 feet.

C. Base Preparation Below Liner Systems

The base preparation below the liner system proposed by the applicant includes grading native till subgrades, filling with native till material (maximum 12-inch lift), placement of an underdrain system (12 inches of sand and 4-inch collection pipes) where the proposed grades are below the phreatic surface, and placement of 12 inches of compacted clay soils (maximum hydraulic conductivity of $1x10^{-7}$ cm/sec).

Based upon the information provided by the applicant, the Board finds that the base preparation below the liner system proposed by the applicant was designed in accordance with 06-096 C.M.R. ch. 401, § 2(D)(3). The proposed grading plan will result in positive drainage to the perimeter of the landfill for the underdrain, leak detection, and leachate collection systems. The materials and placement will meet the performance criteria in the Rules, including gradation, moisture content, density, and hydraulic conductivity.

D. Leachate Conveyance System and Storage Structure Standards

The applicant submitted leachate collection and conveyance system designs for the proposed expansion to handle the predicted leachate, leak detection, and landfill gas condensate flows. The leachate management system components include leachate collection, leak detection, landfill gas condensate collection, leachate transport from the landfill to on-site storage, and the on-site leachate storage tank. The leachate, leak detection, and gas condensate systems include pumping systems and force mains to pump flows from each collection point to the tank. The design of the piping system for collection and conveyance accounts for the stresses due to dynamic and static loading conditions and climate effects anticipated over the life of the landfill. System designs also address filter criteria such as sizing of piping perforations, soil gradation, and component interfaces, so that clogging of the systems will be minimized. The systems were designed for use during operations, closure, and post-closure. All piping components are designed with access for inspection and cleaning.

(1) Leachate Collection System

The applicant designed the leachate collection system to allow all leachate to drain to a collection sump at the low point of the individual landfill cells. Components of the leachate collection system include 6-inch and 8-

inch diameter HDPE collection piping, 12 inches of sand (average hydraulic conductivity greater than $1x10^{-2}$ cm/sec and minimum hydraulic conductivity of $5x10^{-3}$ cm/sec), filter stone and drainage stone around the piping, and a drainage geocomposite.

The applicant used the U.S. Environmental Protection Agency (EPA)'s Hydrogeologic Evaluation for Landfill Performance (HELP) model to estimate leachate generation rates for the proposed expansion. The leachate depth (head) over the primary liner system will be limited to 12 inches, except in leachate sumps. The leachate levels within the landfill cells will be monitored using pressure transducers located at the bottom of each cell.

The application shows that a five-foot layer of select waste will be placed directly over the drainage sand component of the leachate collection system for frost protection, to protect the liner from puncture by other wastes placed in the landfill, and to serve as a filter medium.

In his testimony, intervenor Edward Spencer questioned whether the horizontal pipes in the leachate collection system may collapse. Michael Booth, expert witness for the applicant, testified that the leachate collection pipes are specifically designed for the expansion setting.

Based on the information in the application and hearing record, the Board finds the leachate collection system proposed by the applicant was designed in accordance with 06-096 C.M.R. ch. 401, § 2(D)(4). The Board further finds that the applicant performed static and seismic stability and settlement analyses to address potential movement of the piping in addition to including piping specifications in the application.

(2) Leak Detection System

The application shows that a leak detection system for the proposed expansion will be located under the primary liner system and will consist of the following, from top to bottom: 12-inches of drainage sand, crushed stone, perforated 6-inch diameter HDPE pipe surrounded with drainage stone and a drainage geocomposite. The applicant designed the leak detection system to detect leachate from each cell's primary liner system within 30 days. The fluids collected in the leak detection system will drain by gravity to individual collection sumps located at the low point of each cell and will be pumped to the leachate collection system and from

there pumped into the leachate transport system. Each pump will include a flow meter and sampling ports.

The Board finds the leak detection system proposed by the applicant was designed in accordance with 06-096 C.M.R. ch. 401, § 2(D)(4).

(3) Landfill Gas Condensate System

The application shows that the LFG condensate collection system for the proposed expansion consists of U-shaped condensate traps at low points in the gas conveyance pipe to remove liquid. Condensate collected in the traps will drain to a primary leachate collection system pipe. From there it will be conveyed to an existing landfill leachate header pipe and transported to the on-site leachate storage tank.

The Board finds that the applicant has appropriately addressed collection of LFG condensate as required by 06-096 C.M.R. ch. 401, § 2(D)(4).

(4) Leachate Transport

As stated in the application, leachate transport for the proposed expansion includes temporary and permanent internal cell pump stations that will deliver leachate to dual-walled force mains (6-inch by 10-inch diameter) located within the eastern and western perimeter berms. Temporary pump stations will be installed in each of Cells 11, 12, 14, and 15 and will be utilized during each cell's active period, to be discontinued when each cell becomes inactive and the subsequent lower grade cells are developed. The inactive cell's leachate piping will be connected to the next cell's piping system. The permanent pump stations will be located in Cells 13 and 16 at the lowest base grades and will be operated during active and post-closure periods. Both the temporary and permanent leachate pump stations will utilize a sump and pump design that avoids penetrations of the liner system. The pump stations were sized using the HydroCAD Model to account for storm events and storage volume. Sample ports will be included in all pump stations to allow for the sampling of leachate and each pump will have continuous recording flow meters.

The Board finds the applicant has appropriately addressed the transport of the leachate pursuant to 06-096 C.M.R. ch. 401, § 2(D)(4).

(5) Leachate Storage

As stated in the application, calculations demonstrate that the existing 921,000 gallon above ground glass-lined leachate storage tank is capable of handling the maximum anticipated leachate during the life of the proposed expansion. The storage tank is surrounded by a secondary containment structure with an available volume of 110 percent of the tank. The storage tank was addressed during the issuance of Department license #S-020700-WD-N-A. From the storage tank, tanker trucks will remove the leachate and transport it to the MFGR, LLC wastewater treatment plant in Old Town for treatment and disposal as described in the Leachate Disposal Agreement between MFGR, LLC and NEWSME, effective April 27, 2016. The City of Brewer wastewater treatment plant is available as a back-up disposal facility as described in Industrial Wastewater Discharge Permit #37-2679-07, effective March 3, 2013.

The Board finds the applicant has appropriately addressed on-site leachate storage and off-site treatment and subsequent disposal in accordance with 06-096 C.M.R. ch. 401, § 2(D)(4).

E. Seismic Impact Zone

Information in the application shows that the proposed expansion is located in a seismic impact zone as identified by U.S.G.S. Seismic Hazard Maps. The facility's structures, including liner systems, leachate collection systems, and surface water control systems for the proposed expansion were designed to withstand the maximum horizontal acceleration identified by the Hazard Maps. Additional seismic discussion can be found in Finding 28(A) of this license.

Based upon information in the record, the Board finds that the proposed expansion has been designed to meet the seismic requirements of 06-096 C.M.R. ch. 401, § 2(D)(5).

F. Phased Operations

As set forth in the application, the proposed expansion was designed for phased construction, taking into account waste operations and cover placement, stormwater run-on and run-off, leachate management, protection of the liner system from freeze and thaw effects, and stability. Individual cell size was based on the design waste disposal rates, resulting in approximately 2 years of active waste placement in each cell. Final cover will be installed in a phased manner during construction seasons when new cells are not being developed.

The Board finds that the submitted cell development plans for the 6 proposed cells meet the requirements of 06-096 C.M.R. ch. 401, § 2(D)(6).

27. ALTERNATIVE DESIGN PROCESS

Pursuant to 06-096 C.M.R. ch. 401, § 2(E), an applicant may propose alternatives to the minimum design standard and requirements of section 2(D) of the rule. An applicant is required to submit documentation to clearly and convincingly demonstrate technical equivalency of the proposed alternative.

A. Liner System Barrier Soil Lift Thickness

The landfill liner system requirements include a barrier soil layer placed in maximum lift thicknesses of 9 inches pursuant to 06-096 C.M.R. ch. 401, § 2(D)(1)(g)(iv). The applicant has proposed a barrier soil lift thickness of 12 inches, as has been utilized in the past during construction of Cells 7, 8, and 9 at the existing landfill. The test pad programs utilized during the construction of these cells demonstrated that the performance criteria required in the Rules (densities, moisture content, hydraulic conductivity, soil remolding, and lift bonding) were met utilizing the current available compaction techniques and equipment and project specific soils.

The Board finds that the applicant has submitted documentation referencing past practices that clearly and convincingly demonstrates technical equivalency of placing barrier soil in a 12-inch lift thickness compared to a 9-inch lift thickness, provided that a test pad program is undertaken as proposed in the application and described in Finding 28(L) of this license during construction of each cell of the proposed expansion to demonstrate that the required performance criteria will be met and the results submitted to the Department at least 7 days prior to full scale construction. If the applicant cannot demonstrate technical equivalency, the maximum barrier soil lift thickness will remain 9 inches.

B. Base Preparation Below Liner Systems Lift Thickness

The requirements for constructed base materials below liner systems include a base material maximum allowable compacted lift thickness of 9 inches pursuant to 06-096 C.M.R. ch. 401, § (2)(D)(3)(e). Similar to the liner system barrier soil request described in Finding 27(A) above, the applicant has proposed the placement of barrier soil in a 12-inch lift thickness compared to the required 9-inch lift thickness.

Based on the same reasons noted above for the liner system barrier soil lift thickness, the Board finds that the applicant has submitted documentation during past practices that clearly and convincingly demonstrates technical equivalency of placing barrier soil in a 12-inch lift thickness compared to a 9-inch lift thickness for base material placement, provided that a test pad program is undertaken as proposed in the application and described in Finding 28(L) of this license during construction of each cell of the proposed expansion to demonstrate that the required performance criteria will be met and the results submitted to the Department at least 7 days prior to full scale construction. If the applicant cannot demonstrate technical equivalency, the maximum barrier soil lift thickness will remain 9 inches.

28. ENGINEERING REPORT

The Department's rule at 06-096 C.M.R. ch. 401, § 2(F) requires the applicant to submit an engineering report detailing the basis for engineering design and the proposed construction procedures, utilizing site specific factors and analyzing potential modes and significance of engineered system failures. The application and subsequent information submitted by the applicant addressing Department review comments, included data, calculations, assumptions, and evaluations for the following aspects of the proposed expansion:

A. Stability Assessment

The application for the proposed expansion included a slope stability assessment which analyzed static and seismic loads during construction, operation, and post-closure periods. The stability evaluation included four cross-sections of the proposed expansion representing the steepest base liner slope angle, the steepest final sideslope angles, the greatest waste thickness, and the tallest and steepest exterior waste grades. The geotechnical properties were based on data collected from previous field and laboratory studies and construction projects. The data included density, internal and external friction properties, and cohesion/adhesion as applicable.

The applicant used two potentiometric surfaces in its assessment of landfill stability based on the following: maintenance of the leachate level within the base liner system and a conservative assumption that the potentiometric surface beneath the entire landfill is coincident with the bottom of the base liner system. A sensitivity analysis was completed to evaluate the potential impact of higher water levels. Seismic slope stability was evaluated, utilizing site specific Hazard Maps and the acceptable accelerations. As part of the seismic stability evaluation, the applicant also submitted a liquefaction and deformation analysis. In addition,

a sensitivity analysis was performed on two of the cross-sections for horizontal deformation (strain) of the base liner system.

The site specific data and design parameters were used by the applicant as input to the slope stability computer analysis program SLOPE/W. The resultant calculated factors of safety exceeded the minimum acceptable values required by the Rules, demonstrating that in-place waste and foundation soils beneath and adjacent to the waste can support the proposed expansion loads. The results of the stability assessment and comparison to the applicable safety factor requirements are presented in Tables 9 and 10 (based on the application, Volume III, Table 3-9, page 3-21 and separated into two tables for presentation clarity).

Table 9: Stability Assessment Result Summary
Calculated Slope Stability Minimum Factors of Safety
for Construction and Operations

Cross-Section	Static Condition				Seismic Condition			
	Waste, Shallow surficial	Liner, Block	Foundation (circular)	Rule Minimum	Waste, Shallow surficial	Liner, Block	Foundation (circular)	Rule Minimum
A-A’	1.91	1.73	2.65	1.3	1.54	1.37	2.14	1.1
B-B’	2.43	2.01	2.93		1.88	1.50	2.26	
C-C’	1.90	1.75	2.17		1.53	1.39	1.75	
D-D’	1.92	1.82	2.61		1.55	1.45	2.07	

Table 10: Stability Assessment Result Summary
Calculated Slope Stability Minimum Factors of Safety
for Post Closure

Cross-Section	Static Condition				Seismic Condition			
	Waste, Shallow surficial	Liner, Block	Foundation (circular)	Rule Minimum	Waste, Shallow surficial	Liner, Block	Foundation (circular)	Rule Minimum
A-A’	1.81	1.72	2.65	1.5	1.11	1.00	1.62	1.0
B-B’	2.33	1.98	2.90		1.32	1.05	1.64	
C-C’	1.81	1.74	2.17		1.11	1.01	1.33	
D-D’	1.84	1.81	2.54		1.11	1.04	1.52	

As the proposed expansion development occurs, the applicant will perform individual slope and interface stability assessments as part of each cell design to

confirm the construction and operational phase stability. Similar assessments for each cover system construction project will also be performed.

Based on the information provided in the application, the Board finds that the applicant has met the requirements in 06-096 C.M.R. ch. 401, § 2(F)(1) for static and seismic stability factors of safety, as demonstrated in a slope stability assessment for static and seismic loads during construction, operation, and post-closure periods.

B. Settlement Assessment

The applicant submitted a settlement assessment to predict total and differential settlements of the landfill liner systems, leachate management systems, and cover system components. The settlement assessment quantified the anticipated primary and secondary settlements of the landfill waste and foundation soils and evaluated the effect of the settlements on the base liner system, leachate collection, and cover system components.

The foundation soils below the proposed expansion are a dense to very dense glacial till. Settlement of the foundation soils is predicted to be between 0.0 to 0.3 feet. It was determined that neither the base liner nor leachate collection systems will be compromised by the predicted settlement, since the strains on the geosynthetics (i.e., geomembrane, GCL, drainage geocomposite) will be within acceptable limits, the base liner slopes are estimated to change by less than 0.1% from the design slopes, and the leachate collection piping would continue to maintain positive drainage.

The waste and cover settlement was projected based on the similar composition and behavior of waste existing at the facility. The calculated combined primary and secondary settlements would be between 0 to 8 feet at the end of the 30-year post-closure period. The applicant does not expect these settlements to compromise the cover system since the settlement is projected to occur in a uniform, gradual manner, the cover system's initial slope angles are sufficient to maintain positive drainage even with the predicted settlement, and tensile strains at 0.1% are well below the allowable strain for the textured, linear low density polyethylene (LLDPE) or HDPE geomembrane to be used as a component of the final cover system.

The Board finds that the applicant has met the settlement requirements in 06-096 C.M.R. ch. 401, § 2(F)(2), confirming future predicted settlement will not adversely affect the landfill liner system, leachate collection system, and cover system components.

C. Stability and Settlement Monitoring Plan

The Stability and Settlement Monitoring Plan submitted in the Design Report prepared by SME (Volume III, Section 3.1.5, page 3-26) and the referenced geotechnical monitoring plan (Operations Manual, Volume IV, Appendix N of the application) proposed for the expansion include the installation and monitoring of pore-water pressure transducers at the base of each cell and geotechnical slope stability and settlement inspections of the facility. The pressure transducers will be connected to the pump station control panels and will measure leachate head on the liner system to confirm the leachate collection system design assumptions. The annual inspections will be performed by a qualified geotechnical engineer to observe slopes for cracks, sloughs, seeps, leachate breakouts, displacements, toe-heaving, areas of stressed vegetation; to observe any water ponding; and to compare recent waste placement topographic maps with the previous year's information.

As part of the annual geotechnical inspection, the applicant proposes to conduct an annual review of waste types, quantities, location of waste placement; evaluation of pore pressure data; and review of site aerial topographic surveys. If the design assumptions such as waste streams and pore pressures have changed, then a reassessment may be warranted. A summary of the geotechnical inspections and evaluations will be included in the facility's Annual Report.

The Board finds that the Stability and Settlement Monitoring Plan submitted by the applicant meets the requirements of 06-096 C.M.R. ch. 401, § 2(F)(3) and that the applicant must include the results of the geotechnical inspections and evaluations in a geotechnical report submitted in the Annual Report.

D. Water Balance

EPA's Hydrologic Evaluation of Landfill Performance (HELP) Model was used by the applicant to evaluate the rates and volumes of leachate, including consolidation water, to be generated by the landfill during operations, closure, and post-closure periods. The model results identified the most critical leachate generation conditions over the life of the proposed expansion and were used to design the leachate collection system. Three simulations were performed under conditions of open active waste filling assuming 10 feet of waste and no cover, an intermediate covered condition assuming 90 feet of waste and 18 inches of soil cover, and a final cover condition. The average daily leachate flows were estimated to be approximately 48,000 gallons per day from the entire facility during the operation of the proposed expansion, with an average daily flow during

the peak monthly condition of approximately 57,500 gallons per day. The estimated yearly flows ranged from approximately 22.9 million gallons per year during the operation of Cell 12 to approximately 13.8 million gallons per year during the operation of Cell 15.

The Board finds that the applicant has met the requirements in 06-096 C.M.R. ch. 401, § 2(F)(4) for adequately designing the leachate collection system to convey the predicted leachate flow from the proposed expansion.

E. Leachate Management

The Rules require the applicant to select an appropriate leachate management method and require a leachate management plan. In accordance with 06-096 C.M.R. ch. 401, § 2(F)(5), leachate management options available to the applicant include "off-site transport to a licensed wastewater treatment facility for treatment and disposal." The applicant has proposed to continue the method currently employed at the existing landfill; namely, leachate will be collected and conveyed through a series of pipes above the primary liner system, pumped to the on-site leachate storage tank and trucked to the MFGR, LLC (MFGR) wastewater treatment plant in Old Town (disposal agreement signed April 27, 2016). A contingency plan for leachate disposal limitations at contracted treatment facilities is required in 06-096 C.M.R. ch. 401, § 2(F)(5)(e)(iii), including a letter of intent or service contracts for such proposed contingencies. To meet this requirement, the applicant has provided a back-up agreement for leachate treatment, held with the City of Brewer wastewater treatment plant (disposal agreement effective March 3, 2013). Both MFGR and City of Brewer disposal agreements have a term of 5 years and both treatment facilities hold current wastewater licenses from the Department, as required by the Rules.

The design calculations and drawings for the leachate collection and transport system were submitted with the application and are further described in Finding 26(D) of this license. The leak detection system, located beneath the primary liner system, includes the capability to measure both flow and quality of liquid collected by the system. The leak detection system was based on a design leakage rate as defined in 06-096 C.M.R. ch. 400. The design leakage rate for the primary liner component of the system was calculated to be 0.26 gallons per acre per day, based on potential variables such as geomembrane imperfections, the head above the primary liner, the uniformity of contact between the geomembrane and underlying soil/GCL, and the hydraulic conductivity of the material in contact with the primary liner. In conjunction with the siting and design specifics of the proposed landfill, the design leakage rate is required to be taken into account for assessing hypothetical failures. The leak detection system was designed to detect

leaks from each cell's primary liner system within 30 days, and have sufficient hydraulic capacity to transmit the flow associated with the Action Leakage Rate (ALR) for the proposed expansion. The applicant proposed to determine leachate leakage by comparing the measured specific conductance to values calculated using the selected ALR, leachate specific conductance, and baseline measurements. The monitoring methodology was included in the Liner Action Plan (LAP), submitted as part of the proposed expansion application in the Operations Manual.

During review of the application, Department staff commented on the proposed LAP and recommended an initial two-tiered ALR program based on 20 and 100 gallons per acre per day, followed by consultation with Department staff to determine the appropriate response action (Department technical memorandum dated January 20, 2016 from S. Farrar, V. Eleftheriou, and K. Libbey). Specific conductance could then be utilized to determine further action, but would not be the primary ALR method initially. The applicant may request revisions to the LAP upon submittal of actual field data as the proposed expansion is developed for the Department's approval through changes to the Operations Manual.

Contingency plans were built into the designs for conveyance and transport system failures as described in the application, including conservative design factors and assumptions; materials to be used; periodic maintenance, cleaning, and inspection; monitoring pressure transducers and pressure gauges; alarm systems; back-up pumps and generators; force main dual-containment piping; and easy access to cell pumps.

The volume of leachate generated will be measured through the use of flow meters at each pump station. Leachate and the leak detection system quality will be monitored in accordance with the facility's Environmental Monitoring Plan (EMP), as described in Finding 33 of this license. The leachate management system will be maintained, inspected, and cleaned periodically, as addressed in the facility's Operations Manual section on site maintenance and inspection.

As stated above, the applicant has proposed to transport leachate off-site to the MFGR wastewater treatment facility for treatment and subsequent disposal. Taking into account the proposed expansion, leachate hauling is expected to be approximately 48,000 gallons per day, with an estimated 57,500 gallons per day during peak months. This represents an increase from current hauling loads which average 30,000 gallons per day and 46,000 gallons per day during peak months. The quality of the leachate to be taken off-site and treated is expected to be consistent with the current leachate quality since there is no change in accepted waste types proposed. Leachate samples will be routinely collected from the on-

site storage tank and the leachate and leak detection pump stations for characterization. Data on characteristics of the leachate will be sent to the wastewater treatment facility.

During the hearing, intervenor Edward Spencer questioned the adequacy of the MFGR wastewater treatment facility given closure of the pulp and papermaking operations at the former mill site. Mr. Spencer's witness, Dr. Steve Coghlan, expressed concerns regarding the potential for the discharge of pollutants including metals from the wastewater treatment plant to adversely impact the Penobscot River.

The Board finds that evidence in the record indicates that MFGR's waste discharge license was most recently renewed and amended on October 12, 2016 to reflect the change in wastewater loading to the facility including leachate from JRL. The MFGR license specifically recognizes that "the wastewater characteristics are no longer representative of a kraft pulp mill operation as sources of wastewater are primarily storm water, landfill leachate from JRL, wastewater from the commercial LaBree's Bakery, filter backwash from the Orono-Veazie Water District and septage dewatering filtrate, leachate and storm water runoff from a composting facility" (Department license #W-002226-5O-O-R). In addition to State standards, MFGR's wastewater application was evaluated for compliance with National Effluent Guidelines set forth in 40 CFR, Part 445, *Landfills Point Source Category*, Subpart B, *RCRA Subtitle D Non-Hazardous Waste Landfill.*

MFGR's wastewater treatment license places limits on the concentration of various pollutants in the discharge and requires that discharges from the MFGR wastewater treatment facility be monitored for a range of parameters including, but not limited to, flow, pH, biological oxygen demand, total suspended solids, mercury, whole effluent toxicity, and priority pollutants. The license states that the wastewater treatment facility modifies its treatment protocols as appropriate based on operating parameters such as influent flow, strength, and temperature to meet the effluent limits, including those for metals (metals can be present in the sludge and also within the discharged effluent at allowable levels). In issuing MFGR's renewal license, the Commissioner concluded, based upon a knowledge of the influent and the operation of the MFGR facility, that all applicable licensing criteria for the proposed waste discharge had been met and that the "discharge, either by itself in combination with other discharges, will not lower the quality of any classified body of water below such classification" and that "the provisions of the State's antidegradation policy, 38 M.R.S., § 464(4)(F), will be met."

The Board finds that the applicant has met the applicable requirements in 06-096 C.M.R. ch. 401, § 2(F)(5) for leachate management, based on the submitted leachate management design plans and utilization of a licensed wastewater treatment facility, along with a back-up licensed wastewater treatment facility as the contingency plan, for the treatment of the collected leachate; provided that the applicant maintains a valid leachate disposal contract(s) with licensed waste water treatment facility(ies) for the treatment and disposal of leachate from the proposed expansion.

F. Gas Management

The Landfill Gas Expansion Design Report dated June 2015, prepared by Sanborn Head & Associates, Inc. and submitted with the application, addresses LFG management for the proposed expansion. The existing active LFG extraction system will be expanded to accommodate gas generated from future waste placement. The LFG collection and control system consists of horizontal extraction trenches and vertical extraction wells. Once extracted, the LFG passes through a moisture separator, followed by treatment at a Thiopaq® sulfur removal system to reduce hydrogen sulfide, and is then combusted at the flare. The June 2015 report demonstrates that the existing H_2S removal equipment and flares as addressed in the landfill's existing air license renewal are adequate to handle the LFG from the proposed expansion. A landfill gas to energy facility may be proposed in the future as an alternative to flaring and to generate electricity.

The application states that the LFG collection and control system is utilized to control air emissions, including methane and odors from hydrogen sulfide, as described previously in Finding 11(A) of this license. The existing facility is required to meet the EPA's New Source Performance Standards, 40 CFR Part 60, Subpart WWW, *Standards of Performance for Municipal Solid Waste Landfills* (initially published in 61 FR 9919, March 12, 1996). The application included reference to Subpart WWW, but in 2016, 40 CFR Part 60, Subpart XXX, *Standards of Performance for Municipal Solid Waste Landfills that Commenced Construction, Reconstruction, or Modification after July 17, 2014* (published in 81 FR 59368, Aug. 29, 2016) was promulgated. The proposed expansion will be subject to 40 CFR Part 60, Subpart XXX upon commencing construction of Cell 11. Requirements in the federal regulation include operational standards for gas collection and control systems, as well as provisions for compliance and monitoring.

In the application, Sanborn Head & Associates estimated the LFG generation rate using the EPA's *Landfill Gas Emissions Model, Version 3.02* (LandGEM) for the years 2004 to 2050, with a peak collection rate of approximately 3,600 standard

cubic feet per minute (scfm) in 2031, assuming LFG at 50% methane and taking into account the proposed expansion construction to commence in 2018. The application states that the LFG collection system will be installed in phases as the proposed expansion cells are built. Horizontal extraction trenches will be located in the waste mass, constructed 4-feet wide by 5-feet deep, and contain a 6-inch perforated HDPE pipe surrounded by coarse aggregate. The trenches will be installed approximately every 40 feet in vertical elevation and spaced approximately 100 feet apart. The permanent vertical extraction wells will be constructed of 8-inch diameter schedule 80 polyvinyl chloride pipe, slotted on the lower portion. They will be installed approximately 100 feet on center. Conveyance HDPE pipes will vary from 4 inches to 24 inches in diameter and will be sloped to provide condensate drainage and account for settlement.

LFG management at the facility also includes the installation of intermediate and final cover on non-active portions of the landfill to promote efficient gas collection.

Intervenor Edward Spencer questioned in testimony whether the horizontal pipes in the landfill gas collection system may collapse. Michael Booth, an expert witness for the applicant, testified that the horizontal gas collector trenches are only a temporary collection method and only need to function until the permanent vertical extraction wells are installed once the appropriate waste depth is achieved.

The Board finds that the applicant has met the requirements in 06-096 C.M.R. ch. 401, § 2(F)(6) for LFG collection and control based on the submitted LFG design report and cell development plans, and the proposed expansion will be subject to the requirements of 40 CFR Part 60, Subpart XXX when JRL commences construction on the proposed expansion. The Board further finds that the design and operation of the LFG collection and control system will minimize LFG related nuisance odors.

G. Cell Development Plan

A Cell Development Plan was submitted with the application which illustrates the sequence of development for the proposed expansion in a phased manner, allowing operation in an active landfill cell while construction occurs on the next cell. Phased intermediate and final cover placement are also proposed. Table 11 includes general cell development information, with a schedule for new cell construction approximately every two years. Table 11 was compiled from information in the application, Volume III, Section 3.5.1. Specific plan details with layout of cells, projected grades, location and timing of intermediate and

final cover, location and construction of cell access, relevant aspects of leachate and stormwater management measures, relevant aspects of erosion and sedimentation control measures, and other pertinent facility-specific features are included in the facility's Operations Manual and will be updated with the facility's Annual Report.

Table 11: Proposed Expansion Cell Development Plan Summary* (cell construction listed from first to last, occurring every two years)

Cell Number	Size (acres)	Disposal Capacity (cubic yards)	Construction Items of Note
11	9.5	1,460,000	• Expansion of existing Detention Pond 9; • Year following Cell 11 construction, final cover placed over approximately 14.3 acres of existing landfill.
12	12.6	1,500,000	• Construction of Detention Pond 10; • Relocation of the administration building; • Year following Cell 12 construction, final cover placed over approximately 18.6 acres of existing landfill.
13	11.8	1,580,000	• Construction of Detention Pond 11; • Relocation of the scale house; • Year following Cell 13 construction, final cover placed over approximately 14.6 acres of existing landfill.
14	6.7	1,670,000	• Year following Cell 14 construction, final cover placed over approximately 13.3 acres of existing landfill.
15	6.0	1,500,000	• Year following Cell 15 construction, final cover placed over approximately 15.0 acres of existing landfill.
16	7.1	1,640,000	• Construction of Detention Pond 12; • Over a several year period following Cell 16 construction, final cover placed over remaining 45.5 acres.

Note: *Size and capacity information is approximate. Variations in construction scheduling may occur as development progresses.

The Board finds that the applicant has met the Cell Development Plan Rule requirements in 06-096 C.M.R. ch. 401, § 2(F)(7), including cell development sequencing and phased placement of intermediate and final cover. The Board further finds that the applicant shall update the Cell Development Plan on an annual basis as the proposed expansion is developed.

H. Phased Final Cover System Proposal

The applicant proposed a phased final cover system for the expansion consisting of the following, from top to bottom: 12 inches of vegetative soil, 12 inches of

drainage sand, a 40-mil LLDPE or HDPE textured geomembrane, and 24 inches of barrier soil. Prior to each phase of final cover system construction, an engineering report, construction contract bid documents, including drawings, technical specifications, and contract administrative documents and a quality assurance plan will be submitted to the Department for review and approval. The applicant anticipates that final cover system construction will occur about every other year.

The Board finds that the applicant has met the requirements in 06-096 C.M.R. ch. 401, § 2(F)(8) for a phased cover system; provided that an engineering report, construction contract bid documents, including drawings, technical specifications, and contract administrative documents and a quality assurance plan are submitted to the Department for review and approval at least four months prior to each proposed application of a phased final cover system.

I. Waste Storage, Staging, and Burn Areas Design

The applicant has not proposed additional waste storage and staging areas outside of the solid waste boundary, or a burn area for wood waste or CDD. Rather, the applicant proposes to use the existing permitted wood waste handling area adjacent to the maintenance facility for the proposed expansion. In addition, areas within the existing landfill may be used to temporary stockpile soft layer material to be placed in the bottom of newly constructed cells.

The Board finds that the applicant is not proposing additional waste storage and staging areas outside of the solid waste boundary, or a burn area for wood waste or CDD and will utilize the existing permitted wood waste handling area. Therefore, the provisions requiring submittal of a design and operating plan in accordance with 06-096 C.M.R. ch. 401, § 2(F)(9) do not apply to the proposed expansion; however, the facility shall continue to operate the existing storage and burn area in accordance with the applicable operating requirements.

J. Waste Characterization and Design Compatibility

The Department's rule at 06-096 C.M.R. ch. 401, § 2(F)(10) requires that the wastes proposed to be accepted at the expansion must be characterized to enable the Department to determine that the wastes to be landfilled are non-hazardous and suitable for disposal in accordance with the proposed design, and to support the analytical parameters proposed in the Environmental Monitoring Plan (EMP).

The procedures for the characterization, testing and acceptance of waste at JRL are included in the facility's Solid Waste Characterization Plan in the Operations

Manual. The wastes proposed to be accepted in the expansion are similar to the wastes currently approved for JRL, with the exception of MSW (except for bypass) which will not be accepted in the proposed expansion. Generally, the waste types include wastewater treatment plant and miscellaneous sludge, FEPR, contaminated soils, MSW incinerator ash, biomass and fossil fuel ash, MSW bypass from incinerators, CDD, OBW, CDD process fines, and miscellaneous waste. Finding 37 of this license addresses the acceptable wastes in more detail.

The applicant states that the currently accepted waste types have been previously determined by the Department and JRL to be non-hazardous, compatible for commingling, and compatible with the engineered systems components.

The Board finds that the applicant has provided appropriate waste characterization procedures for the proposed expansion as required by 06-096 C.M.R. ch. 401, § 2(F)(10).

K. Surface Water Control Plans

The Department's Rules at 06-096 C.M.R. ch. 401, § 2(F)(11) require that an applicant submit two surface water control plans: an erosion and sedimentation control plan which meets the standards and submission requirements of 06-096 C.M.R. ch. 400, § 4(J) and a stormwater management plan which meets the standards and submission requirements of 06-096 C.M.R. ch. 400, § 4(M). The applicant's Erosion and Sedimentation Control Plan and the Stormwater Management Plan are described in Findings 14 and 17 of this license.

The Board finds that the applicant has submitted the two required surface water control plans required by 06-096 C.M.R. ch. 401, § 2(F)(11) and that these plans meet the requirements of 06-096 C.M.R. ch. 400, §§ 4(J) and 4(M) as set forth in Findings 14 and 17 of this license.

L. Test Pad Submission

The applicant has proposed to utilize test pads to demonstrate that the proposed barrier soil material and construction methods will result in barrier soil meeting the specified requirements. The test pad program will evaluate the construction techniques to determine conformance with the project technical specifications, similar to the program used during construction of the existing cells at JRL. For base grade, liner, and final cover system construction, a test pad covering an area of approximately 50,000 square feet will be constructed in the cell or cover area. During placement and compaction of the test pad, testing will be performed for moisture, density, and in-place hydraulic conductivity at the appropriate locations

and frequencies. Once the performance criteria is met, up to four shallow test pits will be excavated in the test pad area to evaluate the remolding and bonding of the barrier soil. If the entities involved in construction and oversight, including the Department, concur with the results, the construction techniques utilized on the test pad will continue for the project and the frequency of in-place hydraulic conductivity testing may be reduced with approval from the Department. If the borrow source or material properties change during the course of construction, a new test pad will be required.

The Board finds that the applicant has submitted an appropriate test pad program as required by 06-096 C.M.R. ch. 401, § 2(F)(12). Any reduction in the frequency of the in-place hydraulic conductivity testing must be authorized by the Department.

M. Special Construction Requirements

In accordance with 06-096 C.M.R. ch. 401, § 2(F)(13), at facilities where ground water monitoring in bedrock is anticipated or is being conducted, the applicant must submit information on all measures to be taken to minimize the disturbance of soil material within five feet of the bedrock surface.

The applicant submitted information on measures to be taken to minimize the disturbance of soil material within 10 feet of the bedrock surface where the augmented secondary liner system will be installed. In these areas, the base grade will be cut one foot to accommodate the additional foot of compacted clay to be placed under the secondary liner system. To achieve minimal soil disturbance, the excavator will complete the cut prior to placement of imported soils.

In other areas of the site where the proposed base grades are below the phreatic surface, the applicant has proposed to install an underdrain system to assist with dewatering and to facilitate base liner system construction.

The Board finds that the applicant has submitted measures to minimize soil disturbance that meet the 5 feet to bedrock separation requirement in 06-096 C.M.R. ch. 401, § 2(F)(13).

29. CONTAMINANT TRANSPORT ANALYSIS

In accordance with 06-096 C.M.R. ch. 401, § 2(G), an applicant is required to provide a thorough analysis of the proposed site and the adjacent area that could be affected during operation and after closure of the landfill in the event of releases of contaminants to ground water beyond engineered systems to assess the potential for an unreasonable

threat to sensitive receptors and to identify any operational or monitoring measures needed to ensure protection of sensitive receptors. As defined in the Rules, the potential for an unreasonable threat to a sensitive receptor is an arrival time of less than 6 years from the landfill or less than 3 years from leachate storage structures and pump stations of a concentration of a pollutant which would result in contamination of that sensitive receptor.

The contaminant transport analysis submitted by the applicant consisted of modeling potential leakage scenarios using information from site investigations and appropriate inputs and assumptions. An analytical three-dimensional ground water solute transport equation was used to simulate leachate concentrations from hypothetical leaks. Evaluated hypothetical scenarios included complete failure of the liner system, a leaking liner system, and a leaking leachate force main. The leachate constituents modeled were iron, nitrate, alkalinity, arsenic, chloride, and ammonia since these constituents have the highest concentrations in leachate relative to the ground water and surface water criteria. A sensitivity analysis was also performed.

Based upon information in the application, the Board finds that under the hypothetical failure scenarios, the results of the analysis showed that sensitive receptors in the vicinity of the proposed expansion will not be unreasonably threatened by leachate leaks; the proposed monitoring locations and monitoring frequency will be sufficient to detect changes in water quality from potential failures; and the currently proposed design will provide greater than six years travel time from the landfill's base liner to the sensitive receptors.

The Board further finds that the applicant provided an analysis of potential releases of contaminants to ground water that meets the requirement of the 06-096 C.M.R. ch. 401, § 2(G) and has demonstrated that the proposed expansion will not pose unreasonable threats to sensitive receptors.

30. PLAN VIEW AND PROFILE VIEW DRAWINGS

The Department's rules at 06-096 C.M.R. ch. 401, § 2(H) require that an applicant submit plan and profile drawings that provide information specified in the rule.

The Board finds that the applicant submitted the drawings required in 06-096 C.M.R. ch. 401, § 2(H), including the drawings for existing site conditions, site development, site base grading, underdrain piping, leak detection piping, leachate collection piping, the gas collection and control system, final site drainage, final site development, landfill cross-sections, and specific details of engineered systems.

31. QUALITY ASSURANCE PLAN

The Department's rules at 06-096 C.M.R. ch. 401, § 2(I) requires that an applicant submit a Quality Assurance Plan to assure that design specifications and performance requirements for all facility components are met during construction. The Quality Assurance Plan submitted by the applicant for the proposed expansion includes the following, as related to construction: quality assurance measures to be implemented; the relationship between the Quality Assurance Plan, construction quality control, and the construction contract bid documents; responsible authorities and a resolution process; qualifications of quality assurance personnel and testing laboratories; inspections and tests to be performed for construction conformance; sampling details; recordkeeping and reporting requirements; and a list and description of all items requiring quality assurance certification.

The Board finds that the applicant has submitted a Quality Assurance Plan that addresses the items required by 06-096 C.M.R. ch. 401, § 2(I) to verify conformance with construction design specifications and performance requirements.

32. CONSTRUCTION CONTRACT BID DOCUMENTS

Pursuant to 06-096 C.M.R. ch. 401, § 2(J), an applicant is required to submit construction bid documents. The applicant may submit draft documents at the time the application is filed, and subsequently submit final detailed construction contract bid documents to the Department for review and approval on a schedule approved by the Department.

The application included construction bid documents for Cell 11 consisting of contract administrative documents, technical specifications, and drawings.

The Board finds that the applicant provided the construction contract bid documents for Cell 11 in accordance with the Rules. Prior to the construction of individual subsequent cells (Cells 12 through 16), detailed construction contract bid documents shall be submitted to the Department for review and approval four months prior to commencing construction activities at each cell.

33. WATER QUALITY REPORT AND PROPOSED MONITORING PROGRAM

In accordance with 06-096 C.M.R. ch. 401, § 2(K), an applicant is required to provide a water quality report addressing the site characterization requirements of 06-096 C.M.R. ch. 405, including a water quality monitoring program.

The application includes information on the water quality monitoring program which was established at the site in 1990 and currently includes periodic sampling of 22 monitoring

wells, 3 ground water discharge locations, 6 surface water locations, 10 underdrain locations, and 1 leachate location. The specific sampling and monitoring procedures utilized are detailed in the facility's EMP. The proposed expansion will be integrated into the existing water quality monitoring program, with updates and revisions as appropriate.

The proposed expansion will include the addition of 45 monitoring locations consisting of: background and downgradient piezometers and wells, additional surface water and pore water sampling points, and leak detection and underdrain system monitoring points. The locations will be phased in with the development of the proposed cells over a 10 to 12 year period.

Leachate monitoring for the proposed expansion will consist of sampling at the leachate tank; each leak detection sump discharge; and underdrain discharge. Ground water monitoring for the proposed expansion will consist of sampling of 23 new monitoring wells and 11 existing wells and piezometers. Several existing ground water monitoring wells, piezometers, and open-boreholes in the area of the proposed expansion footprint will be abandoned in accordance with the provisions of 06-096 C.M.R. ch. 405, § 5(H). Surface water monitoring will include sampling of two additional locations to characterize potential shallow ground water discharge and runoff impacts to nearby streams and wetland areas. Water quality sampling for the leachate tank, underdrain and leak detection systems, and monitoring wells will be performed three times a year. The leak detection sump discharges and underdrain discharge will be assessed monthly for flow and specific conductance (the Liner Action Plan, included in the Operations Manual, addresses steps to be taken if water quality changes occur).

During review of the application, Department staff commented that the ground water flow directions are anticipated to change with proposed expansion development and that the EMP should provide for an annual assessment of ground water flow directions (Department technical memorandum dated April 1, 2016 from R. Behr).

As set forth in the application, the water quality monitoring program will continue to be adjusted annually based on the operational status of the cells, development at the facility, the previous year's water quality evaluation, and the results of the Department's annual review of the water quality data.

The Board finds that the applicant submitted a water quality report which both characterized the existing site and proposed a water quality monitoring program as required by the Rules. Water quality monitoring shall be performed according to the EMP for the site. An Annual Water Quality Report evaluating JRL's water quality and an assessment of ground water flow directions as the proposed expansion is developed shall

be compiled each year and submitted with the facility's Annual Report. Proposed changes to the water quality monitoring program shall require Department approval.

34. OPERATIONS MANUAL

In accordance with 06-096 C.M.R. ch. 401, § 2(L), a copy of the facility's operations manual must be submitted as part of the application. The facility's Operations Manual was prepared in accordance with 06-096 C.M.R. ch. 401, § 4(A) and contains revisions to JRL's existing operations manual to address the proposed expansion. As required, the Operations Manual will be reviewed annually by the operator and will be updated as necessary. Since the July 2015 version of the Operations Manual submitted with the application, updates to portions of the Operations Manual have been submitted to the Department as a result of Department comments during the application review process.

The Board finds that the applicant has submitted an Operations Manual in accordance with the requirements of 06-096 C.M.R. ch. 401, § 2(L).

35. CONSTRUCTION

The proposed expansion is subject to the regulatory requirements of 06-096 C.M.R. ch. 401, § 3 during construction, as summarized below:

A. Preconstruction Conference

Unless waived by the Department, a pre-construction conference will be held between the applicant and/or the agents of the applicant and the Department, with at least a 7-day advance notice given to the Department.

B. Quality Assurance Plan

The Quality Assurance Plan (QAP) must be implemented at the beginning of construction. Construction Quality Assurance (CQA) must include continuous site inspections by the CQA personnel. Geosynthetics and barrier soil layers must be inspected, tested, and certified by qualified CQA personnel separate from the owner/operator and contractor.

C. Liner Installation

Before installation of any type of liner system, the applicant must evaluate the impacts of climatic conditions, proposed installation procedures, and the proposed installation schedule on liner system integrity. Results and recommendations from the test pad program must be submitted to the Department for review and

approval. Liner systems may be installed only between April 15 and November 1, and only when the ambient temperature exceeds 32 degrees Fahrenheit, unless a specific cold weather installation plan is submitted to the Department for review and approval.

D. Changes from Approved Plans and Specifications

Prior to implementing any changes to the approved landfill design, the leachate management systems, or project specifications, the applicant must receive approval from the Department through an amendment or minor revision, or through a change order approval.

E. Weekly Inspection Reports

The CQA team responsible for construction inspection at the landfill shall keep daily and weekly construction inspection reports and provide a copy to the Department within one week after each construction week.

F. Photographic Documentation

In the final construction report, the applicant shall provide the Department with representative photographic documentation of each stage of construction.

G. Record Drawings

The applicant shall provide record drawings, signed and stamped by a State of Maine Licensed Professional Engineer, to the Department within 45 days after construction completion of each cell.

H. Final Construction Report and Commencement of Operations

The applicant shall submit a written request that the Department conduct an inspection of the completed construction for a finding of compliance with the facility license. The applicant may commence operations of the landfill upon Departmental approval or ten working days after submitting the written certification stating that the project was constructed in accordance with the approved plans and specifications, and after the Department conducts or waives the need for a final construction inspection. The Department may delay commencement of operations pending resolution of issues identified during its inspection and/or during review of the written certification.

The applicant shall submit a final construction report to the Department within 45 days following construction completion of each cell which includes the items specified in the Rules. The written certification is required as part of the final construction report, but may be submitted prior to the final report in order to expedite approval for commencement of operations.

The Board finds that the applicant must follow the applicable regulatory requirements of the Rules during construction.

36. OPERATIONS

The proposed expansion is subject to the regulatory requirements of 06-096 C.M.R. ch. 401, § 4 during landfill operations, as summarized below.

A. Operations Manual

The Operations Manual must be reviewed annually by the operator and updated as necessary. These updates shall be distributed to the entities holding certified copies, including the Department and key operating and management personnel of the landfill. The landfill operator shall familiarize operating personnel with relevant sections of the Operations Manual.

B. Operator Training and Certification Program

At least two key personnel must be trained in the operation of, and regulatory requirements for, the landfill and be certified as required by the Rules.

C. Operating Requirements

The policy and procedures utilized by JRL to meet the operating requirements in the Rules are addressed in the facility's Operations Manual. These operating requirements include, but are not limited to, updating the Operations Manual on an annual basis, accepting only wastes allowed by the facility's licenses and characterizing these wastes appropriately, and providing for facility inspection and maintenance on a regular basis. Requirements for utilization of an approved cell development plan, environmental monitoring and the appropriate installation of daily, intermediate and final cover are also outlined in the Operations Manual.

D. Annual Report

Pursuant to 38 M.R.S. § 1310-N(6-D) and as stated in 06-096 C.M.R ch. 401, §(4)(D), an Annual Report and fee shall be submitted to the Department in the

timeframe stated in the Rules, currently by April 30 of each year. The Annual Report shall contain the applicable information required by the Rules. The operator shall keep copies of the Annual Reports submitted to the Department throughout the operational and the post-closure care period of the landfill.

The Board finds that the applicant has submitted an Operations Manual for the proposed expansion in accordance with the applicable requirements of the Rules, as also discussed in Finding 34 of this license.

37. ACCEPTABLE WASTE AND OBW LIMIT

A. Acceptable Waste

JRL is currently licensed to accept non-hazardous waste generated within the State, including up to 81,000 tons of MSW a year until March 31, 2018 (license #S-020700-WD-BG-Z issued June 19, 2014). The proposed expansion will be licensed to accept similar waste types; however, the proposed expansion will be prohibited from accepting municipal solid waste, except MSW bypass material. For the purpose of this license, MSW bypass is defined as any MSW that is destined for disposal or processing at a solid waste incinerator, but that cannot be disposed of or processed at that incinerator because of the incinerator's malfunction, insufficient capacity, inability to process or burn, down-time, or any other comparable reason as approved by the Department.

Table 12 is a summary of the non-hazardous waste generated within the State currently allowed in the existing landfill (Volume IV of the application, Table 7-1, page 7-2) and also proposed for disposal in the expansion with the exception of MSW as referenced in the paragraph above.

Table 12: Summary of Acceptable Waste for Disposal in the Proposed Expansion

Air & Water Filtration Media	Leather Scrap Waste
Approved Landfill Utilization Wastes	Municipal Solid Waste (MSW)/MSW Bypass
Asbestos (non-friable)	Municipal Solid Waste Ash
Biomass Boiler Ash	Non-hazardous Chemical Related Products
Biomedical Incinerator Ash	Oversized Bulky Wastes
Burned Railroad Ties & Associated Ash	Pigeon Waste
Catch Basin Grit	Pulp & Paper Mill Sludge
Clean Wood Open Burn Ash	Sandblast Grit
Construction & Demolition Debris	Spoiled Foods
Dredged Spoils from Waterways	Sulfur Scrubbing Residue
Dried Paint Residue & Related Debris	Treated Biomedical Waste
Filter Press Cake & Collagen Scrapings	Urban Fill-type Soils

Fossil Fuel Boiler Ash	Virgin Petroleum Contaminated Soil & Debris
Gasoline Contaminated Soil & Debris, Surface Spill	Waste Oil Contaminated Soil & Debris (Oily Debris)
Gasoline Contaminated Soil & Debris, (UST)	Wastewater Treatment Plant Sludge
Grit Screening Waste	Water Treatment Plant Sludge
Laundry Sludge	

In addition to the above waste streams, JRL may accept individually approved wastes after obtaining the proper special waste licenses from the Department.

In accordance with 38 M.R.S. § 1310-N(11), a solid waste disposal facility owned by the State may not be licensed to accept waste that is not waste generated within the State. As set forth in 38 M.R.S. § 1310-N(11) "waste generated within the State" is defined as including "residue and bypass generated by incineration, processing and recycling facilities within the State or waste, whether generated within the State or outside of the State, if it is used for daily cover, frost protection or stability or is generated within 30 miles of the solid waste disposal facility."

During the hearing, intervenor Edward Spencer and a number of commenters at the public session voiced concerns that incinerators, and processing and recycling facilities are allowed to accept waste from out of state, and once the material is processed by these Maine facilities, the residue and bypass is then considered in-state waste that may be taken to JRL for operational use or disposal. Mr. Spencer and commenters raised concerns that waste with out-of-state point of origins would be allowed to be disposed in a state-owned landfill.

The Board finds that the definition of "waste generated within the State" applies to wastes to be disposed of in the proposed expansion. The Board has no authority to alter State statute.

The Board finds that all waste streams accepted at the facility must be characterized (i.e., tested) and accepted following the procedures in the facility's Solid Waste Characterization Plan. For actual delivery onto JRL's site, waste haulers must have the proper manifest documentation as required in the Operations Manual.

B. OBW Limit

Condition 3 of the PBD requires the applicant to comply with a Department-established OBW tonnage disposal limit, and any subsequent modification to this limit, for the proposed expansion. The PBD condition is stated in full in Finding 20 of this license.

Condition 4 of the PBD requires periodic independent third party audits of CDD processing operations that are anticipated to transport more than 10,000 tons of OBW to the proposed expansion on an annual basis, focusing on the nature and volume of processing residues sent to JRL for disposal. The third party audits are to be conducted by a qualified consultant selected by the Department in consultation with the affected CDD processing facilities and the applicant, with the applicant providing reimbursement for the cost of the audits. The first audit(s) is(are) to occur prior to the disposal of OBW from these processing facilities in the proposed expansion and at subsequent 2-year intervals, unless or until the Department approves their discontinuation. The PBD condition is stated in full in Finding 20 of this license.

The term OBW is not defined in regulation or statute; therefore, for the purpose of this licensing action, OBW refers to the standard industry meaning that includes large items that may be difficult to process, such as mattresses, furniture, appliances, and certain other components of demolition debris.

During the hearing, the applicant and the intervenors presenting testimony were asked to propose an OBW limit. The City of Old Town did not propose a limit. Intervenor Edward Spencer testified that he would need to perform calculations utilizing data from other waste disposal facilities and consider the population to determine a limit. Toni King, Regional Engineer for Casella Waste Systems, Inc.'s Eastern Region, initially testified that no OBW limit was necessary since circumstances related to OBW management have changed since the PBD was issued. Later in the hearing, Ms. King testified that if a limit was to be set, she suggested an OBW limit of 118,000 tons, based on the rounded 2011 amount of 99,000 tons and a 3% Consumer Price Index (CPI) annualized to current time. With respect to the amount of 60,000 tons, as listed in Finding 19, Table 6 of this license, Ms. King testified that 60,000 tons was used in the application for design purposes and was not a proposed OBW quantity limit.

In order to establish an appropriate OBW tonnage limit for the proposed expansion, the Board took into consideration the intent of the PBD condition, the expected operating conditions of the proposed expansion, currently available recycling options and potential future conditions. Table 13 below presents the actual data of OBW disposed at JRL over the last 5 years (excerpted from information submitted in the August 1, 2016 letter from Donald Meagher, NEWSME; note added for clarification).

Table 13: Historical Disposal of OBW at Juniper Ridge Landfill

Year	Generator	Tons	Generator	Tons	Generator	Tons	Generator	Tons	Total
2011	KTI Biofuels	97,584	MERC	1,129	PERC	174	-	-	98,887
2012	KTI Biofuels	62,945	MERC	1,700	PERC	44	-	-	64,689
2013	KTI Biofuels	29,873	MERC	126	PERC	24	ReEnergy	24,330	54,353
2014	-	-	-	-	-	-	ReEnergy	48,219	48,219
2015	-	-	-	-	-	-	ReEnergy	47,388	47,388
Note: From 2011 to 2012 operational efficiencies and recovery capability improvements occurred at the KTI Biofuels facility which reduced the volume of OBW sent to JRL.									

The median disposal amount of OBW for the five years was determined to be 54,353 tons. The median CPI from this 5 year timeframe was determined to be 1.5% (the five-year period CPIs were 3.0% (2011), 1.7% (2012), 1.5% (2013) 0.8% (2014), and 0.7% (2015)). During hearing cross-examination, Ms. King noted that 10,000 tons of OBW from the PERC facility will likely need to be disposed of annually at JRL due to an operations change at PERC (based on current 2016 data). Utilizing this information, a calculation consisting of the median plus the estimated PERC amount multiplied by the median CPI was performed with a result of approximately 65,000 tons OBW [((54,353 + 10,000) x 1.015) = 65,000].

The Board finds that an OBW limit of 65,000 tons on an annual basis at the proposed expansion is consistent with the intent of Condition 3 of the PBD and is appropriate to meet the State's current OBW solid waste needs provided that the OBW limit is evaluated annually and adjusted as necessary based on current OBW recycling opportunities, economic factors, and other relevant factors at the time of the annual evaluation. If a limit adjustment is required, the OBW limit will be revised either through the provisions of 38 M.R.S. § 341-D(3) or a license application submitted by the applicant through the provisions of 38 M.R.S. § 344(9) and 06-096 C.M.R. chs. 2 and 400. The Board further finds that the Department will coordinate periodic independent third party audits of CDD processing operations that are anticipated to transport more than 10,000 tons of OBW to the proposed expansion on an annual basis consistent with Condition 4 of the PBD.

STATE OF MAINE, ACTING THROUGH THE BUREAU OF GENERAL SERVICES OLD TOWN, PENOBSCOT COUNTY, ME JUNIPER RIDGE LANDFILL EXPANSION #S-020700-WD-BI-N and #L-19015-TG-D-N (APPROVAL WITH CONDITIONS)	90)))))	SOLID WASTE LICENSE, NATURAL RESOURCES PROTECTION ACT, AND WATER QUALITY CERTIFICATION NEW LICENSE

NATURAL RESOURCES PROTECTION ACT

38. NATURAL RESOURCES PROTECTION ACT AND WATER QUALITY CERTIFICATION

In accordance with the Natural Resources Protection Act, 38 M.R.S. § 480-D, the Department shall grant a permit when it finds that the applicant has demonstrated that the proposed activity meets the applicable standards including provisions pertaining to the following: existing scenic, aesthetic, recreational and navigational uses; soil erosion; harm to habitats and fisheries; interference with natural water flow; water quality; flooding; sand or gravel supply; and outstanding river segments. NRPA standards applicable to the proposed expansion are discussed in this Finding section.

To identify and assess impacts to protected natural resources, the applicant submitted a natural resources assessment for the expansion prepared by Stantec Consulting Services, Inc. (Stantec).

The natural resources assessment indicates that the proposed expansion will impact approximately 2.04 acres of primarily forested freshwater wetlands through direct filling and 0.1 acres of the critical terrestrial habitat of one significant vernal pool (SVP) due to clearing for a relocated perimeter fence and an electric line. The impacts to the NRPA regulated SVP were authorized in a permit-by-rule that was accepted by the Department on July 29, 2015 and are not further considered in this licensing proceeding. With the exception of the one vernal pool addressed in the permit-by-rule, the wetlands that will be impacted by the expansion are not Wetlands of Special Significance as defined in 06-096 C.M.R. ch. 310, § 4.

Stantec evaluated the functions and values of the impacted wetlands and prepared a Wetlands Compensation Plan which was submitted in support of its NRPA permit application. The Wetlands Compensation Plan also addresses 12 vernal pools within and adjacent to the expansion area which are regulated by the U.S. Army Corps of Engineers but which are not regulated by the Department under NRPA.

A. Existing Scenic, Aesthetic, Recreational, or Navigational Uses

Pursuant to 38 M.R.S. § 480-D(1), the applicant must demonstrate that the activity will not unreasonably interfere with the existing scenic, aesthetic, recreational or navigational uses of the protected natural resources. The Department's rule 06-096 C.M.R. ch. 315, guides the Department in its analysis of impacts to existing scenic and aesthetic uses resulting from activities in, on, over or adjacent to protected natural resources subject to NRPA.

In support of its application and in accordance with 06-096 C.M.R. ch. 315, the applicant submitted a copy of the Department's Visual Evaluation Field Survey Checklist as Appendix A to the NRPA application along with a description of the property and the proposed project. The applicant also submitted several photographs of the proposed project site including an aerial photograph. The Board visited the project site on June 23, 2016 to view the physical features of the site, including portions of the wetlands that will be filled by the expansion, and the nature of the surrounding area.

An unreasonable adverse visual impact is defined in 06-096 C.M.R. ch. 315, § 4 as one that is "expected to unreasonably interfere with the general public's visual enjoyment and appreciation of a scenic resource." The freshwater wetland impacted by the expansion does not meet the definition of a scenic resource as set forth in 06-096 C.M.R. ch. 315 § 10 in that it is not one of the listed scenic resources nor is it a wetland that is "visited by the general public, in part, for the use, observation, enjoyment and appreciation of its natural and cultural visual qualities."

Finding 10(C) of this license analyzes and makes findings on the proposed expansion's compliance with the scenic character criteria under the solid waste Rules.

There is no evidence of any existing recreational or navigational uses of the impacted wetlands.

Based upon the information in the record including the applicant's scenic assessment, photographs of the site, and the site visit, the Board finds that the proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational or navigational uses of the protected natural resource.

B. Soil Erosion

In accordance with 38 M.R.S. § 480-D(2), the applicant must demonstrate that the activity will not cause unreasonable erosion of soil or sediment nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

As discussed in Finding 14 of this license, the applicant conducted an assessment of surficial soils at the site and submitted an Erosion and Sedimentation Control Plan, dated July 2015, prepared by SME. The applicant proposes to install silt fence and other temporary erosion control measures, detention ponds and berms for each landfill cell prior to the construction of the cells. Once a cell has been

completed and filled with waste, the cell cover will be installed, and final stabilization measures will be taken. The applicant states that the design and implementation of all erosion control measures will follow the requirements of the solid waste Rules and will comply with Maine's Erosion and Sedimentation Control Best Management Practices.

Based upon the information in the record including the construction plan with phased development of landfill cells and the Erosion and Sedimentation Control Plan, the Board finds that the proposed expansion will not cause unreasonable erosion of soil or sediment nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment, as required by 38 M.R.S. § 480-D(2).

C. Habitat Considerations

Pursuant to 38 M.R.S. § 480-D(3), the applicant must demonstrate the activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life.

The expansion will impact 2.04 acres of primarily forested freshwater wetland due to filling. Impacts to these wetlands and associated compensation are discussed in Finding 38(F). Additionally, the proposed expansion is located approximately 800 feet from an unnamed intermittent brook, 950 feet from an unnamed tributary to Pushaw Stream, and approximately 2,350 feet from Judkins Brook. All of these streams are located in the watershed of the Penobscot River which contains Atlantic salmon, and Judkins Brook is located within federally mapped Critical Habitat for Atlantic salmon.

Intervenor Edward Spencer's expert witness, Dr. Steve Coghlan, testified that the expansion could negatively impact Atlantic salmon, Atlantic sturgeon, and shortnose sturgeon due, in part, to the potential for stormwater and leachate to contaminate adjacent waterways and ultimately the Penobscot River.

The applicant responded that its natural resources assessment prepared by Stantec inventoried and assessed potential impacts to natural resources at the site, including rare, threatened and endangered species. Stantec concluded that the project would not have an unreasonable adverse impact on these resources due in part to the location of the expansion relative to the protected resources, the design of the expansion, and management of stormwater and leachate.

Dr. Coghlan's concerns and the applicant's response are discussed further in Finding 9 of this license which is incorporated herein.

Additionally, Mr. Spencer commented that pumping groundwater to allow for construction will have an impact on the adjacent wetlands and Atlantic salmon habitat. Many of the wetlands surrounding the site are forested wetlands and their hydrology is not due to groundwater discharge, but rather results from surface water perched on the low permeability glacial till. Furthermore, the technical design of the underdrain system is that the underdrains (sand and piping) will collect and transport groundwater by gravity, not by active pumping, over portions of three cells where the bottom of the cell will be below the groundwater table. It is expected that the seepage into the underdrain will continue, but then will eventually diminish over time.

The Maine Department of Marine Resources (DMR) reviewed the proposed project and stated that it should not cause any significant adverse impact to Atlantic salmon or other marine resources.

The Maine Department of Inland Fisheries and Wildlife (MDIFW) reviewed the proposed project and stated that, with the exception of one SVP (impacts to which were authorized in the permit-by-rule), there are no other essential or significant wildlife habitats at the project site.

Based on the setback of the expansion from the streams, the evidence supplied by the applicant in its natural resources assessment and related expert testimony, and the review comments submitted by sister agencies DMR and MDIFW, the Board finds that the activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life pursuant to 38 M.R.S. § 480-D(3).

D. Water Quality Considerations

Pursuant to 38 M.R.S. § 480-D(4), the applicant must demonstrate that the activity will not unreasonably interfere with the natural flow of any surface or subsurface waters. Pursuant to 38 M.R.S. § 480-D(5) and Section 401 of the Federal Water Pollution Control Act, the applicant must demonstrate that the activity will not violate any state water quality law, including those governing the classification of the State's waters.

As set forth above, the expansion will be located approximately 800 feet from an unnamed intermittent brook, 950 feet from an unnamed tributary to Pushaw

Stream, and approximately 2,350 feet from Judkins Brook. Information in the record shows that the nearest mapped sand and gravel aquifer is located approximately one mile east of the landfill expansion area.

As discussed more fully in Findings 12, 14, and 15 of this license, the applicant submitted a Stormwater Management Plan and an Erosion and Sedimentation Control Plan, dated July 2015, prepared by SME to manage surface water runoff and minimize impacts to surface water quality from siltation. Additionally, the landfill expansion is designed in accordance with the Department's solid waste Rules to minimize the potential for contamination of groundwater. Leachate from the expansion will be collected, stored on-site, and trucked off-site to the MFGR, LLC wastewater treatment plant in Old Town which is licensed to accept the leachate. The project was reviewed by the Department's Division of Water Quality Management which stated that the treatment plant is currently operating in compliance with its license.

The Board finds that the proposed expansion meets state water quality law, including those governing the classification of the State's waters based on the location of the expansion relative to the protected natural resources, the existing and proposed Stormwater Management System, the Erosion and Sedimentation Control Plan, and the collection and subsequent treatment of the leachate at a licensed wastewater treatment facility.

E. Flooding

In accordance with 38 M.R.S. § 480-D(6), the applicant must demonstrate that the activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.

As discussed in Finding 17, the expansion will not be located in a 100-year flood plain or restrict the flow of a 100-year flood. The applicant also submitted a Stormwater Management Plan which included pre- and post-development stormwater analyses up to and including a 25-year, 24-hour storm event which demonstrate that post-development peak flows will not exceed pre-development peak flows.

Based upon the location of the expansion outside the floodplain and the Stormwater Management Plan, the Board finds that the expansion will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.

F. Wetlands and Waterbodies Protection Rules

The applicant proposes to directly alter 2.04 acres of primarily forested freshwater wetlands to construct the proposed landfill expansion. Including this proposed project and the previous projects on this site, the total cumulative amount of wetland alteration at the site will be 3.35 acres.

The Department's rule at 06-096 C.M.R. ch. 310 elaborates on the NRPA criteria for obtaining a permit. The rules guide the Department in its determination of whether a project's impacts would be unreasonable. A proposed project would generally be found to be unreasonable if it would cause a loss in wetland area, functions and values and there is a practicable alternative to the project that would be less damaging to the environment. Each application for a NRPA permit that involves a freshwater wetland alteration must provide an analysis of alternatives.

(1) Alternatives Analysis

The applicant provided an alternatives analysis (Volume V, Attachment 2 of the Application) which summarized the need for the project and examined alternatives to the selected project site and project design, including: development of alternative sites, a "no build" alternative, waste reduction/alternative waste management strategies, and alternative designs on-site that would impact less wetland area. The applicant stated that alternative State-owned landfill sites, such as Dolby in Millinocket and Carpenter Ridge in T2R8 NWP (currently undeveloped), and the one commercial landfill (Crossroads in Norridgewock) were not viable options because JRL was the only site which had a Public Benefit Determination. The applicant stated that the "no build/do nothing" option was not viable because existing landfills could not accommodate the anticipated waste volumes and a need for 9.35 million cubic yards of additional landfill capacity had already been documented and approved in the PBD for JRL. The alternatives analysis also considered waste management options (discussed in Findings 18 and 19 of this license). Finally, the analysis examined the placement of the expansion on the site and the design of the expansions cells in relationship to the existing waste disposal cells at JRL.

Intervenor Edward Spencer questioned whether the applicant would be required to demonstrate that the proposed expansion could not occur at another location, such as the state-owned Dolby Landfill in Millinocket or by development of the state-owned site at Carpenter Ridge. In response, the Board Chair ruled in the Third Procedural Order that since the Commissioner had issued a PBD for a 9.35 million cubic yard expansion

at JRL, consideration of alternative sites and the no-build alternative were not issues to be addressed in the current licensing proceeding. The Third Procedural Order states:

> The Applicant has received a Public Benefit Determination for the proposed expansion at the Juniper Ridge site and that determination was upheld by the Board on appeal. As stated in the Second Procedural Order, statute prohibits the Board from revisiting the Public Benefit Determination in this licensing proceeding (38 M.R.S. § 1310-N(3-A)(B)). Therefore, the Board will not allow testimony or cross-examination by the parties regarding the need for the proposed 9.35 million cubic yard expansion. Additionally, testimony that the State should seek to develop other landfill sites is not relevant to the current licensing proceeding. However, to the extent the Public Benefit Determination imposes conditions on any license that may be issued in this proceeding, including limits on the types and volumes of waste, those limits are arguably relevant and may be addressed in testimony and cross-examination (Third Procedural Order).

The Board finds that the amount of capacity needed and the general location of disposal were settled with the Commissioner's issuance of the PBD, leaving only the question of whether or not the proposed project could be located on the subject parcel and designed to avoid and minimize wetland impacts.

(2) Avoidance of On-Site Impacts

As discussed above, the applicant submitted an alternatives analysis for the proposed project dated July 2015. The applicant considered two other on-site designs for the JRL expansion, a 70-acre expansion which would have resulted in 4.5 acres of wetland impact and a 60-acre expansion which would have resulted in 3.4 acres of wetland impact. The design submitted for approval and which is the subject of this license will expand the solid waste footprint at JRL by approximately 54 acres and will directly impact 2.04 acres of freshwater wetlands. In its application, the applicant stated that it has located all roads, stormwater ponds, administrative buildings, and other infrastructure to avoid the greatest amount of wetland impacts. According to the applicant, in order to meet

the stated project purpose, some impacts to freshwater wetlands are unavoidable.

(3) Minimization of On-Site Impacts

In accordance with 06-096 C.M.R. ch. 310, § 5(B), the amount of freshwater wetland to be altered must be kept to the minimum amount necessary for meeting the overall purpose of the project. The applicant's design of the expansion utilizes upland areas for a majority of the expansion. The applicant proposes to build cells vertically, thereby minimizing the horizontal footprint and associated wetland impacts. Finally, additional capacity is obtained by utilizing the "in-fill" areas between existing landfill cells and the proposed expansion cells. The Board finds that the applicant's design minimizes impacts to wetlands to the greatest extent practicable.

(4) Compensation

In accordance with 06-096 C.M.R. ch. 310, § 5(C), compensation is the off-setting of a lost wetland function with a function of equal or greater value. The goal of compensation is to achieve no net loss of freshwater wetland functions and values. The amount of compensation required to replace lost functions depends on a number of factors including: the size of the alteration activity, the functions of the wetlands to be altered, the type of compensation to be used, and the characteristics of the compensation site. When wetland preservation is the type of compensation proposed, Department rules generally require a ratio of 8:1 (area preserved to area impacted). As stated previously, the applicant's Wetlands Compensation Plan was designed to address both NRPA and Corps requirements.

The applicant proposes to preserve a 266-acre area on the same parcel as the landfill expansion to address NRPA compensation requirements as well as Corps compensation requirements. The proposed preservation area is adjacent to an existing 16-acre preservation area along Judkins Brook. The functions and values of the freshwater wetlands on the parcel were evaluated by the applicant using the U. S. Army Corps of Engineers Highway Methodology (September, 1999). The functions and values of the freshwater wetlands proposed to be impacted by the project include flood flow alteration, nutrient removal, sediment and toxicant removal, and wildlife habitat. There are no SVPs (other than the one which was the

subject of the permit-by-rule) or other significant wildlife habitats in the wetlands to be impacted.

The preservation area contains 57 acres of freshwater wetland, 25 vernal pools, and upland habitat. Three of the vernal pools are SVPs and eight others are highly functioning vernal pools that met the biological criteria to be considered an SVP, but did not meet all of the necessary criteria. The functions and values of the preservation area include sediment and toxicant removal, flood flow alteration, nutrient removal, and wildlife habitat. Bryan Emerson, professional wetland scientist and witness for the applicant, testified that the applicant has proposed compensation in excess of that required by both NRPA and the Corps. NRPA requires approximately 16.3 acres of wetland compensation for the 2.04 acres of direct impact to wetlands. The Corps compensation requirements differ from those of the Department and require a greater ratio of acres preserved to acre impacted.

The applicant proposes to preserve the area through the use of a Declaration of Covenants and Restrictions (Declaration) and submitted proposed language that meets Department standards. The City of Old Town has agreed to be the Third Party under the Declaration, with third party rights of administration and enforcement. Prior to the start of construction, the applicant must record the Declaration in the Registry of Deeds and must submit a copy of the recorded deed to the Department's Bureau of Land Resources within 60 days of recording.

Based on the Public Benefit Determination, the applicant's alternatives analysis, the project's design, and the land preservation proposal, the Board finds that the applicant has avoided and minimized freshwater wetland impacts to the greatest extent practicable, and has provided compensation for wetland impacts in accordance with Department rules and in exceedance of NRPA requirements. The Board further finds that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project provided that, prior to construction, the applicant records the Declaration of Covenants and Restrictions and submits a copy to the Department's Bureau of Land Resources as described above.

BASED on the above Findings of Fact, and subject to the Conditions listed below, the Board makes the following CONCLUSIONS pursuant to 38 M.R.S. §§ 1310 to 1319-Y, 38 M.R.S. § 2101, and the applicable Department Rules:

STATE OF MAINE, ACTING THROUGH THE BUREAU OF GENERAL SERVICES OLD TOWN, PENOBSCOT COUNTY, ME JUNIPER RIDGE LANDFILL EXPANSION #S-020700-WD-BI-N and #L-19015-TG-D-N (APPROVAL WITH CONDITIONS)	99)))))	SOLID WASTE LICENSE, NATURAL RESOURCES PROTECTION ACT, AND WATER QUALITY CERTIFICATION NEW LICENSE

1. The applicant has submitted evidence that the proposed expansion will not pollute any water of the State, contaminate the ambient air, constitute a hazard to health or welfare, or create a nuisance pursuant to 38 M.R.S. § 1310-N(1)(A) and 06-096 C.M.R. ch. 400, § 3(D).

2. The applicant has complied with the public and local participation and notification requirements pursuant to 38 M.R.S. §§ 1310-S(1) and 1310-N(12) and 06-096 C.M.R. ch. 2, §§ 10, 13, and 14.

3. The applicant has demonstrated sufficient title, right, or interest in all of the property which is proposed for development or use pursuant to 06-096 C.M.R. ch. 400, § 4(A).

4. The applicant has provided a sufficient demonstration of financial ability and assurance and technical ability for the permitting, design, construction, operation, closure, and post-closure care of the proposed landfill expansion pursuant to 38 M.R.S. §§ 1310-N (2-F)(A) and § 1310-Y, and 06-096 C.M.R. ch. 400, §§ 4(B)(1) and 4(C)(1), provided NEWSME submits the appropriate financial assurance package updates in accordance with the Rules on an annual basis.

5. The applicant has provided a civil/criminal disclosure statement demonstrating that the entities are not in violation of environmental or criminal law pursuant to 38 M.R.S. § 1310-N(7) and 06-096 C.M.R. ch. 400, § 4(C)(1)(b) and § 12.

6. The applicant has provided sufficient provisions for safe and uncongested traffic movement of all types into, out of, and within the proposed landfill expansion pursuant to 38 M.R.S. § 1310-N (2-F)(B) and 06-096 C.M.R. ch. 400, § 4(D)(1); provided the facility continues to encourage waste haulers to use I-95 as a primary hauling route.

7. The applicant has provided sufficient provisions for fitting the proposed landfill expansion harmoniously into the existing natural environment; has provided buffer strips of sufficient size and quality to adequately protect aquatic and wildlife habitat and the natural environment; and will not unreasonably adversely affect protected natural resources and rare, threatened and endangered plant and animal species pursuant to 38 M.R.S. § 1310-N(2-F)(C) and 06-096 C.M.R. ch. 400, § 4(E)(1).

8. The applicant has sufficiently demonstrated that the proposed expansion will not unreasonably adversely affect existing uses and scenic character, including bird hazard to aircraft, historical sites, established public viewing areas, excessive noise at the property boundary or at any protected location, or existing uses of neighboring property pursuant to 38 M.R.S. § 1310-N(2-F)(C) and 06-096 C.M.R. ch. 400, § 4(F)(1); provided equipment use is restricted in the operating hour of 6:00 am to 7:00 am to only equipment

with a combined sound level of 77 dBA at 50 feet or less if within 60 feet of the western solid waste boundary (approximately 480 feet from the western property line).

9. The applicant has sufficiently demonstrated that the proposed expansion will not unreasonably adversely affect air quality pursuant to 38 M.R.S. § 1310-N(2-F)(C) and 06-096 C.M.R. ch. 400, § 4(G)(1).

10. The applicant has sufficiently demonstrated that the proposed expansion will not unreasonably adversely affect water quality or cause an unreasonable threat to the quality of a classified body of surface water pursuant to 38 M.R.S. §§ 1310-N(2-F)(C) and 1310-N(1-A) and 06-096 C.M.R. ch. 400, § 4(H)(1).

11. The applicant has sufficiently demonstrated that the proposed expansion will not unreasonably adversely affect other natural resources in the municipality or in neighboring municipalities pursuant to 38 M.R.S. § 1310-N(2-F)(C) and 06-096 C.M.R. ch. 400, § 4(I)(1).

12. The applicant has sufficiently demonstrated that the proposed expansion will not: overlie any significant sand and gravel aquifers; pose an unreasonable threat to the quality of a significant sand and gravel aquifer; pose an unreasonable threat to the quality of an underlying fractured bedrock aquifer, or pose an unreasonable risk that a discharge to a significant ground water aquifer will occur, pursuant to 38 M.R.S. §§ 1310-N(2-A) and 1310-N(2-F)(E), and 06-096 C.M.R. ch. 400, § 4(K)(1).

13. The applicant has made sufficient provisions for adequate utilities, including adequate water supplies and appropriate sanitary wastewater disposal, and sufficiently demonstrated that the facility will not have an unreasonable adverse effect on existing or proposed utilities in the municipality or area served by those utilities, pursuant to 38 M.R.S. § 1310-N(2-F)(F) and 06-096 C.M.R. ch. 400, § 4(L)(1).

14. The applicant has sufficiently demonstrated that the proposed expansion will be located on soils types suitable to the nature of the undertaking and the facility will not cause unreasonable erosion of soil or sediment pursuant to 38 M.R.S. §§ 1310-N(2-F)(D) and 1310-N(1-A)(A) and 06-096 C.M.R. ch. 400, § (4)(J)(1).

15. The applicant has sufficiently demonstrated that the proposed expansion will not unreasonably cause or increase flooding on-site or on adjacent properties nor create an unreasonable flood hazard to a structure pursuant to 38 M.R.S. §§ 1310-N(2-F)(G) and 06-096 C.M.R. ch. 400, § 4(M)(1).

16. The applicant has sufficiently demonstrated that the purpose and practices for the proposed expansion are consistent with the solid waste management hierarchy pursuant

to 38 M.R.S. §§ 2101 and 1310-N(1)(D) and 06-096 C.M.R. ch. 400, § 4(N)(1), provided that a summary of continued efforts to meet the hierarchy and relevant supporting data are submitted annually in the Annual Report.

17. The applicant has sufficiently demonstrated that the proposed expansion will accept solid waste that is subject to recycling and source reduction programs, voluntary or otherwise, at least as effective as those in the statute and other provisions of State law; the volume of the waste and the risks related to its handling and disposal have been reduced to the maximum practical extent by recycling and source reduction prior to being landfilled or incinerated; and the applicant has shown consistency with the recycling provisions of the State plan pursuant to 38 M.R.S. § 1310-N(5-A) and 06-096 C.M.R. ch. 400, § 6(B).

18. The applicant is exempt from the liability insurance requirements of 06-096 C.M.R. ch. 400, § 10.

19. The applicant has clearly and convincingly demonstrated the technical equivalency of placing a barrier soil layer in a 12-inch lift thickness compared to the required 9-inch lift thickness, provided that a test pad program is undertaken during construction of each cell of the proposed expansion as described in the application and Finding 28(L) of this license to demonstrate that the required performance criteria have been met and the results are submitted to the Department at least 7 days prior to full-scale construction. If the applicant cannot demonstrate technical equivalency, the maximum barrier soil lift thickness will remain 9 inches.

20. The applicant has completed a site assessment report that adequately supports the design of the proposed expansion and will conduct water quality monitoring in accordance with the Rules.

21. The applicant has submitted a quality assurance plan and construction contract bid documents including drawings, technical specifications, and contract administrative documents for Cell 11 of the proposed expansion in accordance with 06-096 C.M.R. ch. 401, § 2 (I) and (J).

22. The applicant has proposed an expansion design meeting the requirements of the Rules, provided that, an engineering report, construction contract bid documents, including drawings, technical specifications, and contract administrative documents, a quality assurance plan and erosion and sedimentation control and stormwater management plans are submitted to the Department for review and approval at least four months prior to the commencement of construction activities within each subsequent cell (Cells 12 through 16) of the proposed expansion; and the applicant maintains a valid leachate disposal contract(s) with licensed waste water treatment facility(ies) for the treatment and disposal of leachate from the proposed expansion.

23. The applicant has submitted a phased final cover system meeting the requirements of the Rules, provided that an engineering report, construction contract bid documents, including drawings, technical specifications, and contract administrative documents, and a quality assurance plan and erosion and sedimentation control and stormwater management plans are submitted to the Department for review and approval at least four months prior to the proposed application of a phased final cover system.

24. The applicant has submitted an Operations Manual that meets the operating requirements of 06-096 C.M.R. ch. 401, § 2(L), provided that the Operations Manual is reviewed annually and updated as necessary with the Annual Report.

25. The PBD partial approval issued by the Commissioner in 2012 requires that an annual limit be established in this license on the tonnage of OBW that may be disposed of in the proposed expansion, with future review and potential subsequent modification to the OBW limit, and established provisions for the independent third party audits of CDD processing operations that are anticipated to transport more than 10,000 tons of OBW to the proposed expansion for disposal on an annual basis.

BASED on the above Findings of Fact, and subject to the Conditions listed below, the Board makes the following CONCLUSIONS pursuant to 38 M.R.S. §§ 480-A through 480-JJ, Section 401 of the Federal Water Pollution Control Act, and the applicable Department rules:

26. The applicant has sufficiently demonstrated that the proposed expansion will not unreasonably interfere with existing scenic, aesthetic, recreational or navigational uses pursuant to pursuant to 38 M.R.S. § 480-D(1).

27. The applicant has sufficiently demonstrated that the proposed expansion will not cause unreasonable erosion of soil or sediment nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment pursuant to 38 M.R.S. § 480-D(2).

28. The applicant has sufficiently demonstrated that the proposed expansion will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life pursuant to 38 M.R.S. § 480-D(3), provided the applicant records the Declaration of Covenants and Restrictions as described in Finding 38(F) of this license above.

29. The applicant has sufficiently demonstrated that the proposed expansion will not unreasonably interfere with the natural flow of any surface or subsurface waters pursuant to 38 M.R.S. § 480-D(4).

30. The applicant has sufficiently demonstrated that the proposed expansion will not violate any state water quality law, including those governing the classification of the State's waters pursuant to 38 M.R.S. § 480-D(5) and Section 401 of the Federal Water Pollution Control Act.

31. The applicant has sufficiently demonstrated that the proposed expansion will not unreasonably cause or increase the flooding of the alteration area or adjacent properties pursuant to 38 M.R.S. § 480-D(6).

THEREFORE, the Board APPROVES the noted applications of the applicant, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations:

1. The Standard Conditions of Approval for Solid Waste and NRPA, copies attached.

2. Severability. The invalidity or unenforceability of any provisions, or part thereof, of this license shall not affect the remainder of the provision or any other provision. This license shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

3. Soil Erosion. The applicant shall take all necessary actions to ensure that its activities or those of its agents do not result in unnecessary or noticeable erosion of soils on site during construction and operation of the landfill expansion.

4. Financial Assurance. The applicant shall submit the appropriate financial assurance package updates in accordance with the Rules on an annual basis, including the most recent surety bond documentation.

5. New Cell Construction Submittals. At least 4 months prior to new cell construction and related infrastructure, the applicant must submit the detailed design package for the Department's review and approval. The submittal shall contain the information required by the Rules, including, but not limited to an engineering report, construction contract bid documents consisting of technical specifications, drawings and contract administrative documents, a quality assurance plan and erosion and sedimentation control and stormwater management plans. If the Rules applicable to any aspect of the design and construction of the landfill expansion and its ancillary structures change during the development of the proposed expansion, the applicant shall address the new requirements in subsequent pertinent submittals.

6. Equipment Use - Noise Limitation. From the hour of 6:00 am to 7:00 am, the applicant shall limit equipment use within 60 feet of the western solid waste boundary

(approximately 480 feet from the western property line) to equipment with a combined sound level of 77 dBA at 50 feet or less.

7. Hauler Policy. The applicant shall continue its policy of encouraging hauling trucks to utilize I-95 to reduce use of the Bennoch Road (Route 16).

8. Leachate Disposal Contracts. In accordance with the Rules, the applicant shall maintain valid leachate disposal contract(s) with licensed waste water treatment facility(ies) for the treatment and disposal of leachate from the proposed expansion. A contingency plan for leachate disposal limitations at contracted treatment facilities shall be in place, including a letter of intent or service contracts for such proposed contingencies. Subsequent updates to the leachate disposal documentation shall be submitted to the Department to demonstrate compliance with the leachate management requirements of the Rules.

9. Liner Action Plan (LAP). The LAP shall initially consist of two-tiered action leakage rates of 20 and 100 gallons per acre per day, requiring notification and follow-up interactions with the Department to determine the appropriate response action. Specific conductance shall be utilized as the secondary approach for determining additional response action. As the proposed expansion is developed and upon submittal of actual field data, the applicant may request revisions to the LAP through Operations Manual updates requiring Department approval through the Annual Report.

10. Acceptable Waste

A. In the landfill expansion, the applicant may accept the same non-hazardous waste generated within the State allowed in the existing landfill and under the previously issued waste stream licenses for the facility, with the exception of MSW.

B. The applicant is prohibited from accepting MSW in the landfill expansion. MSW bypass may be accepted in accordance with Condition 11 of this license.

C. OBW disposal at the proposed landfill expansion shall be limited pursuant to Condition 12 of this license.

D. Prior to accepting any waste for disposal not listed or referenced in the application and previously licensed, the applicant shall submit an application for the new waste to the Department for review and approval.

E. Allowable wastes shall be accepted at the landfill expansion in accordance with the facility's Solid Waste Characterization Plan and regulatory and statutory requirements.

11. MSW Bypass

A. The applicant shall not dispose of any unprocessed MSW from any source other than MSW bypass from MSW incinerators located in Maine.

B. The applicant shall not accept MSW bypass from an incinerator without verifiable authorization from the owner/operator of an incinerator that a MSW bypass event has been called.

C. The applicant shall notify the Department within 24 hours if a MSW bypass event continues from a particular incinerator for a period exceeding 2 days, and provide the reason for the MSW bypass event.

12. OBW

A. The applicant shall be restricted to an OBW disposal limit of 65,000 tons on an annual basis in the proposed expansion.

B. No OBW from the CDD processing operations subject to audit shall be disposed in the proposed expansion prior to the first independent third party audit of CDD processing operations conducted as set forth in Condition 12(D) of this license, unless otherwise approved by the Department.

C. The OBW limit shall be evaluated annually by the Department and modified as needed based on current OBW recycling opportunities, economic factors, and other relevant factors. Modification of the OBW limit will be accomplished either through a license modification process pursuant to 38 M.R.S. § 341-D(3) or a license application submitted by the applicant pursuant to 38 M.R.S. § 344(9) and 06-096 C.M.R. chs. 2 and 400.

D. NEWSME shall reimburse the Department for periodic independent third party audits of CDD processing operations that are anticipated to transport more than 10,000 tons of OBW to the expansion for disposal on an annual basis. The audits shall be conducted to verify the results of the demonstrations required under the provisions of *Processing Facilities,* 06-096 C.M.R. ch. 409, § 2(C), focused on the nature and volume of processing residues being sent to the JRL expansion for disposal. The independent third party audits shall be conducted by a qualified consultant selected by the Department in consultation with the affected CDD processing facilities and NEWSME. The first such audit(s) shall occur prior to the disposal of OBW from these processing facilities to the proposed expansion,

unless otherwise approved by the Department. Audits will be conducted at 2-year intervals, unless or until the Department approves their discontinuation.

13. Monthly Activity Reports. Monthly activity reports shall be provided to the Department and include the quantities of the various waste types, and their sources, delivered to the proposed expansion.

14. Annual Reports

In addition to the specific requirements set forth in the Rules, the applicant shall include the following in the facility's annual reports submitted to the Department:

A. The amount of unprocessed MSW bypass received at the proposed expansion from each of the approved sources.

B. A summary of the steps taken by the facility in the reporting year to continue to meet the hierarchy, including relevant metrics to evaluate effectiveness (i.e., tons of material diverted from landfill disposal by Casella companies; tons of materials reused, reduced, recycled at the landfill); a description of ongoing efforts to increase the effectiveness of these programs/efforts; and any additional pertinent hierarchy-related information.

C. A geotechnical report, including a summary of the geotechnical inspections; the annual review of waste types, quantities, and location of waste placement; the evaluation of pore pressure data; and the review of site aerial topographic surveys.

15. EMP - Ground Water Quality and Flow. The applicant shall provide for an annual assessment of ground water quality and flow directions as the proposed expansion is developed through updates to the EMP which shall occur on an ongoing basis and in accordance with Department recommendations.

16. Construction Requirements. The applicant shall meet the construction requirements of 06-096 C.M.R. ch. 401, § 3 for the proposed expansion, including, but not limited to: implementing the Quality Assurance Plan; meeting liner installation requirements; receiving approval from the Department for changes to the approved plans and specifications; and documenting and reporting appropriately, including submittal of a final construction report. At least 7 days prior to full scale barrier soil construction, the applicant shall submit the results of a test pad to demonstrate the technical equivalency of placing barrier soil in a 12-inch lift thickness compared to a 9-inch lift thickness. If the applicant cannot demonstrate technical equivalency, the maximum barrier soil lift thickness shall remain 9 inches.

STATE OF MAINE, ACTING THROUGH THE BUREAU OF GENERAL SERVICES OLD TOWN, PENOBSCOT COUNTY, ME JUNIPER RIDGE LANDFILL EXPANSION #S-020700-WD-BI-N and #L-19015-TG-D-N (APPROVAL WITH CONDITIONS)	107)))))	SOLID WASTE LICENSE, NATURAL RESOURCES PROTECTION ACT, AND WATER QUALITY CERTIFICATION NEW LICENSE

17. Operating Requirements. The applicant shall meet the operating requirements of 06-096 C.M.R. ch. 401, § 4 for the landfill expansion, including, but not limited to: reviewing and updating the Operations Manual as applicable; training and certifying key personnel; operating the facility per the Rule requirements; and submitting an Annual Report and associated fee.

18. Federal Requirements - LFG Collection and Control System. The applicant shall meet the applicable requirements of 40 CFR Part 60, Subpart XXX for the LFG collection and control system for air emissions minimization and odor control.

19. Phased Final Cover. The applicant shall submit the engineering report, construction contract bid documents, consisting of technical specifications, drawings, and contract administrative documents, a quality assurance plan and erosion and sedimentation control and stormwater management plans for the placement of phased final cover to the Department for its review and approval at least 4 months prior to each proposed application of final cover.

20. Declaration of Covenants and Restrictions. Prior to the start of construction, the applicant shall record the Declaration of Covenants and Restrictions for the preservation area in the Registry of Deeds and shall submit a copy of the recorded deed to the Department's Bureau of Land Resources within 60 days of recording.

21. The Findings of Fact, Conclusions and Conditions remain as approved in Department license #L-19015-31-A-M dated August 24, 1995, and subsequent Licenses to date.

DONE AND DATED AT AUGUSTA, MAINE THIS 1st DAY OF June, 2017.

BOARD OF ENVIRONMENTAL PROTECTION

BY: _____
James W. Parker, Board Chair and Presiding Officer

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

Date of initial receipt of application: July 21, 2015
Date of application acceptance: August 7, 2016 (solid waste); July 31, 2016 (NRPA)

Date filed with the Board of Environmental Protection:

XKT79512 and LC/L19015DN/ATS#79502

Appendix A

STANDARD CONDITIONS
TO ALL SOLID WASTE LANDFILL LICENSES

STRICT CONFORMANCE WITH THE STANDARD AND SPECIAL CONDITIONS OF THIS APPROVAL IS NECESSARY FOR THE PROJECT TO MEET THE STATUTORY CRITERIA FOR APPROVAL. VIOLATIONS OF THE CONDITIONS UNDER WHICH A LICENSE IS ISSUED SHALL CONSTITUTE A VIOLATION OF THAT LICENSE AGAINST WHICH ENFORCEMENT ACTION MAY BE TAKEN, INCLUDING REVOCATION.

1. **Approval of Variations from Plans.** The granting of this approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed by the license. Any consequential variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation.

2. **Compliance with All Applicable Laws.** The licensee shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.

3. **Compliance with All Terms and Conditions of Approval.** The licensee shall submit all reports and information requested by the Department demonstrating that the licensee has complied or will comply with all terms and conditions of this approval. All preconstruction terms and conditions must be met before construction begins.

4. **Transfer of License.** The licensee may not transfer the solid waste facility license or any portion thereof without approval of the Department.

5. **Initiation of Construction or Development Within Two Years.** If the construction or operation of the solid waste facility is not begun within two years of issuance of within 2 years after any administrative and judicial appeals have been resolved, the license lapses and the licensee must reapply to the Department for a new license unless otherwise approved by the Department.

6. **Approval Included in Contract Bids.** A copy of the approval must be included in or attached to all contract bid specifications for the solid waste facility.

7. **Approval Shown to Contractors.** Contractors must be shown the license by the licensee before commencing work on the solid waste facility.

8. **Background of key individuals.** A licensee may not knowingly hire as an officer, director or key solid waste facility employee, or knowingly acquire an equity interest or debt interest in, any person convicted of a felony or found to have violated a State or federal environmental law or rule without first obtaining the approval of the Department.

9. **Fees.** The licensee must comply with annual license and annual reporting fee requirements of the Department's rules.

10. **Recycling and Source Reduction Determination for Solid Waste Disposal Facilities.** This condition does not apply to the expansion of a commercial solid waste disposal facility that accepts only special waste for landfilling.

The solid waste disposal facility shall only accept solid waste that is subject to recycling and source reduction programs, voluntary or otherwise, at least as effective as those imposed by 38 M.R.S. Ch. 13.

11. **Deed Requirements for Solid Waste Disposal Facilities.** Whenever any lot of land on which an active, inactive, or closed solid waste disposal facility is located is being transferred by deed, the following must be expressly stated in the deed:

A. The type of facility located on the lot and the dates of its establishment and closure.

B. A description of the location and the composition, extent, and depth of the waste deposited.

C. The disposal location coordinates of asbestos wastes must be identified.

Natural Resources Protection Act (NRPA)
Standard Conditions

THE FOLLOWING STANDARD CONDITIONS SHALL APPLY TO ALL PERMITS GRANTED UNDER THE NATURAL RESOURCES PROTECTION ACT, 38 M.R.S.A. § 480-A ET SEQ., UNLESS OTHERWISE SPECIFICALLY STATED IN THE PERMIT.

A. Approval of Variations From Plans. The granting of this permit is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation.

B. Compliance With All Applicable Laws. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.

C. Erosion Control. The applicant shall take all necessary measures to ensure that his activities or those of his agents do not result in measurable erosion of soils on the site during the construction and operation of the project covered by this Approval.

D. Compliance With Conditions. Should the project be found, at any time, not to be in compliance with any of the Conditions of this Approval, or should the applicant construct or operate this development in any way other the specified in the Application or Supporting Documents, as modified by the Conditions of this Approval, then the terms of this Approval shall be considered to have been violated.

E. Time frame for approvals. If construction or operation of the activity is not begun within four years, this permit shall lapse and the applicant shall reapply to the Board for a new permit. The applicant may not begin construction or operation of the activity until a new permit is granted. Reapplications for permits may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.

F. No Construction Equipment Below High Water. No construction equipment used in the undertaking of an approved activity is allowed below the mean high water line unless otherwise specified by this permit.

G. Permit Included In Contract Bids. A copy of this permit must be included in or attached to all contract bid specifications for the approved activity.

H. Permit Shown To Contractor. Work done by a contractor pursuant to this permit shall not begin before the contractor has been shown by the applicant a copy of this permit.

DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: March 2012 **Contact: (207) 287-2811**

SUMMARY

There are two methods available to an aggrieved person seeking to appeal a licensing decision made by the Department of Environmental Protection's ("DEP") Commissioner: (1) in an administrative process before the Board of Environmental Protection ("Board"); or (2) in a judicial process before Maine's Superior Court. An aggrieved person seeking review of a licensing decision over which the Board had original jurisdiction may seek judicial review in Maine's Superior Court.

A judicial appeal of final action by the Commissioner or the Board regarding an application for an expedited wind energy development (35-A M.R.S.A. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S.A. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S.A. § 636-A) must be taken to the Supreme Judicial Court sitting as the Law Court.

This INFORMATION SHEET, in conjunction with a review of the statutory and regulatory provisions referred to herein, can help a person to understand his or her rights and obligations in filing an administrative or judicial appeal.

I. ADMINISTRATIVE APPEALS TO THE BOARD

LEGAL REFERENCES

The laws concerning the DEP's *Organization and Powers*, 38 M.R.S.A. §§ 341-D(4) & 346, the *Maine Administrative Procedure Act*, 5 M.R.S.A. § 11001, and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 CMR 2 (April 1, 2003).

HOW LONG YOU HAVE TO SUBMIT AN APPEAL TO THE BOARD

The Board must receive a written appeal within 30 days of the date on which the Commissioner's decision was filed with the Board. Appeals filed after 30 calendar days of the date on which the Commissioner's decision was filed with the Board will be rejected.

HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, c/o Department of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017; faxes are acceptable for purposes of meeting the deadline when followed by the Board's receipt of mailed original documents within five (5) working days. Receipt on a particular day must be by 5:00 PM at DEP's offices in Augusta; materials received after 5:00 PM are not considered received until the following day. The person appealing a licensing decision must also send the DEP's Commissioner a copy of the appeal documents and if the person appealing is not the applicant in the license proceeding at issue the applicant must also be sent a copy of the appeal documents. All of the information listed in the next section must be submitted at the time the appeal is filed. Only the extraordinary circumstances described at the end of that section will justify evidence not in the DEP's record at the time of decision being added to the record for consideration by the Board as part of an appeal.

WHAT YOUR APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time submitted:

1. *Aggrieved Status*. The appeal must explain how the person filing the appeal has standing to maintain an appeal. This requires an explanation of how the person filing the appeal may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions or conditions objected to or believed to be in error.* Specific references and facts regarding the appellant's issues with the decision must be provided in the notice of appeal.
3. *The basis of the objections or challenge.* If possible, specific regulations, statutes or other facts should be referenced. This may include citing omissions of relevant requirements, and errors believed to have been made in interpretations, conclusions, and relevant requirements.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license or permit to changes in specific permit conditions.
5. *All the matters to be contested*. The Board will limit its consideration to those arguments specifically raised in the written notice of appeal.
6. *Request for hearing.* The Board will hear presentations on appeals at its regularly scheduled meetings, unless a public hearing on the appeal is requested and granted. A request for public hearing on an appeal must be filed as part of the notice of appeal.
7. *New or additional evidence to be offered.* The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered by the Board in an appeal only when the evidence is relevant and material and that the person seeking to add information to the record can show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process or that the evidence itself is newly discovered and could not have been presented earlier in the process. Specific requirements for additional evidence are found in Chapter 2.

OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with all relevant material in the DEP record.* A license application file is public information, subject to any applicable statutory exceptions, made easily accessible by DEP. Upon request, the DEP will make the material available during normal working hours, provide space to review the file, and provide opportunity for photocopying materials. There is a charge for copies or copying services.
2. *Be familiar with the regulations and laws under which the application was processed, and the procedural rules governing your appeal.* DEP staff will provide this information on request and answer questions regarding applicable requirements.
3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed the license normally remains in effect pending the processing of the appeal. A license holder may proceed with a project pending the outcome of an appeal but the license holder runs the risk of the decision being reversed or modified as a result of the appeal.

WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will formally acknowledge receipt of an appeal, including the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials accepted by the Board Chair as supplementary evidence, and any materials submitted in response to the appeal will be sent to Board members with a recommendation from DEP staff. Persons filing appeals and interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. With or without holding a public hearing, the Board may affirm, amend, or reverse a Commissioner decision or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, a license holder, and interested persons of its decision.

II. JUDICIAL APPEALS

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court, see 38 M.R.S.A. § 346(1); 06-096 CMR 2; 5 M.R.S.A. § 11001; & M.R. Civ. P 80C. A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. Failure to file a timely appeal will result in the Board's or the Commissioner's decision becoming final.

An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S.A. § 346(4).

Maine's Administrative Procedure Act, DEP statutes governing a particular matter, and the Maine Rules of Civil Procedure must be consulted for the substantive and procedural details applicable to judicial appeals.

ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal process, for administrative appeals contact the Board's Executive Analyst at (207) 287-2452 or for judicial appeals contact the court clerk's office in which your appeal will be filed.

Note: The DEP provides this INFORMATION SHEET for general guidance only; it is not intended for use as a legal reference. Maine law governs an appellant's rights.

APPENDIX B
COMPLIANCE SELF-AUDIT CHECKLIST

JUNIPER RIDGE LANDFILL
COMPLIANCE SELF-AUDIT EVALUATION
REPORT YEAR

This Compliance Self-Audit Evaluation is to be used to perform an annual audit of landfill operations as required by of Chapter 401, Section 4.D. (1) (b) of the State of Maine Solid Waste Management Rules. The purpose of this audit is to verify general compliance with the site operations manual, licenses and regulatory requirements. Qualified facility personnel performed the audit.

Facility Name……. **Juniper Ridge Landfill**

Location…….. **Old Town, Maine**

Audit for Calendar Year…..

Compliance Auditor…….. **Jeffrey Pelletier**

Title……. **Environmental Manager**

Signature of Auditor…….

GENERAL EVALUATION:

1. **Are active facility licenses kept on file at the facility?**

2. **Do the facility licenses have special license conditions relating to landfill operations?**

3. **What pending licenses or approvals were sought from the MEDEP at the time of this audit.**

4. **Date of payment of MEDEP Annual License Fee.**

5. **Date of submittal of previous MEDEP Annual Report & Fee.**

6. **Does the facility have a Host Community Agreement in-place and on file?**

7. **Does the facility have a current liability insurance policy in-place and on file at the facility?**

8. **Has the facility submitted an executed financial assurance instrument for closure and post closure care along with updated closure/post closure cost estimates to the MEDEP?**

9. **Last date a certified copy of the facility Operations Manual was updated.**

10. **MEDEP approval date of last updated Operations Manual.**

11. **Number and locations of the Certified Copies of the Operations Manual.**

12. Operational personnel who received landfill training during audit year.

13. Are only solid wastes or special wastes as allowed in the landfill's current license accepted and are those wastes handled as described in the landfill's Operations Manual?

14. Are solid wastes and special wastes permitted for acceptance characterized on an ongoing basis in conformance with the characterization plan approved by the Department?

15. Is access to the facility controlled so that the public is not exposed to potential health and safety hazards and access is only permitted when an attendant is on duty?

16. Are the hours of operation and other limitations for access and use prominently posted at the entrance to the landfill?

17. Are the access roads within the facility maintained?

18. Are any access roads into the active cell of the landfill constructed and maintained to prevent migration of leachate outside of the cell.

19. Is a road maintenance program appropriately implemented to prevent the accumulation of dust, mud, or wastes from the facility access, public, or private roads?

20. Are the appropriate signs posted or other approved means implemented to indicate clearly where solid waste is to be unloaded and the location of any separate handling areas?

21. **Are the setbacks and buffer strips approved by the Department being maintained?**

22. **Are the cell development plans up-to-date and submitted with the annual report?**

23. **Is compaction performed at least once per operating day and more often as necessary unless otherwise approved by the Department?**

24. **Has cover been placed as outlined in the operations manual?**

25. **Have storm water management and erosion control measures been implemented as outlined in the operations manual?**

26. **Are leachate management systems including collection, transport, storage, and pumping systems maintained in accordance with the site Operations Manual?**

27. **Are landfill gas systems installed and maintained as outlined in the Operations Manual?**

28. **Is a methane gas-monitoring program implemented to verify the concentration of explosive gases generated by the landfill, and if an exceedance is triggered, appropriate steps are taken to protect human health and the Department notified of the occurrence and the protective steps that were taken?**

29. **Are routine inspections of the landfill facilities performed as outlined in the Operations Manual, and are records of the inspections kept on file at the facility?**

30. **Does the facility have a fire protection plan in-place and is it outlined in the operations manual?**

31. **Does the facility have a hazardous and special waste handling and exclusion plan and is it implemented at the facility?**

32. **Does the facility have a litter control plan and is it implemented as outlined in the Operations Manual?**

33. **Has the Environmental Monitoring Program been implemented as outlined in the Operations Manual?**

34. **Environmental sampling events being conducted as required and results reported to the MEDEP.**

35. **Are waste staging and storage areas maintained as outlined in the Operations Manual?**

36. **Is a vector control program in-place and implemented as outlined in the operations manual?**

37. **Does the facility accept asbestos wastes?**

APPENDIX C
OPERATOR TRAINING PROGRAM OUTLINE

2026 Safety Training Calendar

	Landfill / GTE	MRF / Transfer Station	Hauling	Mechanics	Industrial Solutions	Administrative
January	Fire Precautions / Fire Extinguisher Truck Fire Procedures/Hot Load Policy Landfill Equipment Procedures Landfill Fire Procedures	Fire Precautions Fire Extinguisher Truck Fire Procedures/ Hot Load Policy/Safe Backing	Fire Precautions Fire Extinguisher Truck Fire Procedures/ Hot Load Policy/ Safe Backing	Fire Precautions Fire Extinguisher Truck Fire Procedures/Hot Load Policy Safe Backing	Fire Precautions Fire Extinguisher Truck Fire Procedures/Hot Load Policy Safe Backing	Fire Precautions Fire Extinguisher
February	Forklift / Skid-Steer Safety Forklift Certification/Observation Pushing Waste Landfill Driver Safety	Forklift / Skid-Steer Safety Forklift Certification/Observation Trailer Securement Machine Guarding	Safe Work Guidelines (by LOB) Landfill Driver Safety	Forklift / Skid-Steer Safety Forklift Certification/Observation Machine Guarding	Forklift / Skid-Steer Safety Forklift Certification/Observation Trailer Securement/Loading Dock Operations	Loading Dock Operations
March	Tip Floor Policy/Emergency Response Landfill Emergency Action Plan Spill Response Sloping and Grading	Tip Floor Policy/Emergency Response Review Site Action Plan Spill Response	Tip Floor Policy/Emergency Response Review Site Action Plan Spill Response	Tip Floor Policy/Emergency Response Review Site Action Plan Spill Response Lift / Platform Safety	Tip Floor Policy/Emergency Response Review Site Action Plan Spill Response Lift / Platform Safety	Tip Floor Policy/Emergency Response Review Site Action Plan
April	Confined Space Awareness Mounting and Dismounting Lock-Out / Tag-Out LOTO Periodic Test/Certification Towing Stuck Vehicles	Mounting and Dismounting Lock-Out / Tag-out LOTO Periodic Test/Certification	Mounting and Dismounting Lock-Out / Tag-Out LOTO Periodic Test/Certification	Mounting and Dismounting Lock-Out / Tag-Out Awareness Procedures for Mechanics LOTO Periodic Test/Certification	Mounting and Dismounting Lock-Out / Tag-Out LOTO Periodic Test/Certification	Mounting and Dismounting Lock-Out / Tag-Out LOTO Periodic Awareness/Certification
May	Heat Stress Personal Protective Equipment Safe Lifting Heavy Equipment and Landfill Vehicle Parking	Heat Stress Personal Protective Equipment Safe Lifting	Heat Stress Personal Protective Equipment Safe Lifting	Heat Stress Personal Protective Equipment Safe Lifting Portable Ladder Safety	Heat Stress Personal Protective Equipment Safe Lifting	Safe Lifting
June	Cell Phone Policy Accident & Injury Reporting Dust Control	Cell Phone Policy Accident & Injury Reporting	Cell Phone Policy Accident & Injury Reporting Helper Safety Overhead and Downed Power Line Safety	Cell Phone Policy Accident & Injury Reporting Welding Safety - Hot Work Permits	Cell Phone Policy Accident & Injury Reporting	Accident & Injury Reporting
July	Landfill Bird Control Program Landfill Communications Offloading Trucks at Landfills	Safe Backing Observation Certificate Smith System - Driving	Safe Backing Observation Certificate Smith System - Driving	Safe Backing Observation Certificate Smith System - Driving	Lead Acid Battery Safety	
August	Stress Management Workplace Violence/Active Shooter Review Heavy Equipment Blocking/Cribbing	Stress Management Workplace Violence/Active Shooter Review Tipping Floor Vehicle Dumping Awareness	Stress Management Workplace Violence/Active Shooter Review Tipping Floor Vehicle Dumping Awareness	Stress Management Workplace Violence/Active Shooter Review Tipping Floor Vehicle Dumping Awareness	Stress Management Workplace Violence/Active Shooter Review	Stress Management Workplace Violence/Active Shooter Review
September	Equipment Inspection Maintenance and Cleaning of Equipment	Equipment Inspection Maintenance and Cleaning of Equipment Baler and Grinder Safety	Driver Vehicle Inspection Report Hours of Service (2020 update)	Equipment Inspection Maintenance and Cleaning of Equipment DVIR- Mechanic Procedures Hours of Service (2020 Update)	Equipment Inspection Baler and Grinder Safety	Vehicle and Equipment Inspection Paperwork Review and Processing
October	Cold Stress Pedestrian Safety Awareness Landfill Walking Safety Pinch Point	Cold Stress Pedestrian Safety Awareness Pinch Point	Cold Stress Pedestrian Safety Awareness Pinch Point	Cold Stress Pedestrian Safety Awareness Power and Hand Tool Safety Pinch Point	Cold Stress Pedestrian Safety Awareness Pinch Point	
November	Hazard Communication Slips, Trips, and Falls Hydrogen Sulfide (H2S) Safety Gas Extraction / HDPE Fusing / Pipe Work	Hazard Communication Slips, Trips, and Falls	Hazard Communication Slips, Trips, and Falls	Hazard Communication Slips, Trips, and Falls Flammable Liquids Compressed Gases	Hazard Communication Slips, Trips, and Falls	Slips, Trips, and Falls
December	Blood Borne Pathogens Wheel Berms and Stops Excavation and Trenching	Blood Borne Pathogens Hearing Conservation Fall Protection (if applicable)	Bloodborne Pathogens	Blood Borne Pathogens Hearing Conservation Fall Protection Crane/Hoist/Chain Safety Jacks and Jack Stands	Blood Borne Pathogens Hearing Conservation	

Last Updated: 1/132026

APPENDIX D
CELL DEVELOPMENT PLANS

Included are the following:

- **CELL 11 Development / Landfill Gas System Expansion Drawings**
- **CELL 12 Development / Landfill Gas System Expansion Drawings**
- **CELL 13 Development / Landfill Gas System Expansion Drawings**
- **CELL 14 Development / Landfill Gas System Expansion Drawings**
- **CELL 15 Development / Landfill Gas System Expansion Drawings**
- **CELL 16 Development / Landfill Gas System Expansion Drawings**

CELL 11 Development / Landfill Gas System Expansion Drawings

JUNIPER RIDGE LANDFILL
CELL 11 DEVELOPMENT

1.0 CELL 11 SYSTEM OVERVIEW

Cell 11 is approximately 9.5 acres in size and is located east of the existing Cells 7 and 9. Cell 11 is planned to be constructed in 2018 to be available for waste placement in 2019. The Cell 11 liner system will consist of a composite primary liner, a leak detection system, and a secondary liner. The composite primary liner will consist of the following components:

- An 80-mil high-density polyethylene (HDPE) textured geomembrane;
- A geosynthetic clay liner (GCL); and
- A 12-inch clay barrier soil layer (hydraulic conductivity (K) less than or equal to $1x10^{-7}$ cm/sec).

The leak detection system will consist of the following components:

- A 12-inch layer of sand ($K \geq 1x10^{-3}$ cm/sec);
- A network of 6-inch diameter perforated HDPE pipe;
- A geocomposite drainage net; and
- A dedicated leak detection pump system.

The leak detection system has been designed to detect leaks, within 30 days. The secondary liner will consist of a 60-mil HDPE textured geomembrane. Directly below the secondary liner system will be 12 inches of clay with a hydraulic conductivity (K) less than or equal to $1x10^{-7}$ cm/sec.

The Cell 11 leachate collection system consists of a 12-inch layer of granular material with a hydraulic conductivity greater than 5 $x10^{-3}$ cm/sec, perforated HDPE laterals (minimum diameter 6 inches) and a perimeter transport pipe (minimum diameter 8 inches), stone pipe filters, and a drainage geocomposite. The leachate collection system is a gravity drain system which flows to the Cell 11 temporary collection sump and pump system located at the northeast corner of the

cell. Clean outs are provided for the Cell 11 leachate laterals, and perimeter transport piping. Existing Cell 7 and Cell 9 leachate header cleanouts will be extended from west to east across Cell 11 to the perimeter berm to provide access to these pipes for cleaning.

The Cell 11 leachate pump system consists of a primary 5 horsepower pump located in the bottom of the sump, and a secondary 5 horsepower pump located in the riser pipe on the sideslope. The primary pump has the ability to pump design flows, while the secondary pump serves as a backup pump to the primary pump. Both pumps are piped through a header system to a dual-containment leachate force main located in the perimeter berm. The force main allows the leachate to be pumped from the Cell 11 sump to the 921,000-gallon aboveground storage tank for temporary storage prior to trucking the leachate off-site for treatment.

Liquids that collect in the Cell 11 leak detection layer drain to the leak detection sump, located on the northeast side of the cell. The sump has a 1 horsepower pump that pumps liquids into the leachate collection sump. The leak detection pump system is equipped with a flow meter and sample port to monitor leak detection flows and water quality. The leak detection system has the hydraulic capacity to transmit the predicted flows associated with the Expansion's primary liner action leakage rate and rapid and large leakage rate.

2.0 CELL 11 DEVELOPMENT

Initial conditions prior to waste placement into Cell 11 is shown on Figure 1. After the initial placement of the 5-foot soft/ frost protection layer within Cell 11, waste placement and operations of Cell 11 will be performed in accordance with the operating procedures contained in Section 7.0 of the Operations Manual. The various phases of waste placement are shown on Figures 2 through 6. Associated operational details such as the cell access road ramp, perimeter berm intermediate cover, leachate collection inlet, temporary up-slope stormwater diversion berm, temporary mid-slope intermediate berm, chimney drain, downspout, and plunge pool are shown on Figures E-1, E-2 and E-3 in Appendix E. Access to the cell will initially be from the north end of Cell 11 and will be constructed over the perimeter berm as detailed on Figure E-2.

Portions of Cell 11 waste placement will piggy-back onto the eastern waste slope of Cells 7 and 9. Prior to filling against the eastern sideslope of the existing cells, temporary cover materials will be removed to the height of the next waste lift and up-slope stormwater diversion berms will be constructed to divert clean stormwater runoff away from the active operating area as detailed on Figure E-2. During the initial waste placement, operations along the perimeter of Cell 11 the waste will be placed as shown in the detail on Figure E-2 to allow infiltration and stormwater that comes in contact with exposed waste into the perimeter drainage stone or sand. This area will become a temporary stormwater drainage ditch when the intermediate geomembrane cover is installed on the first stage which will direct stormwater to perimeter berm down spouts and plunge pools shown on Figure 1. As the soft layer is placed, chimney drains will be installed at the locations shown on Figure 1 to increase the draining capacity of the waste mass. The chimney drains will be constructed of tire shreds and piping through the 5-foot soft waste layer only to minimize the gas emissions from these structures.

Waste placement operations in Cell 11 will progress until Stage 1 grades are achieved as shown on Figure 2. At the completion of the filling of Stage 1 and prior to Stage 2 filling, mid-slope intermediate berms, leachate transport piping and leachate collection inlets will be located as shown on Figure 3. Horizontal gas collection trenches will be installed and connected to the site's gas management infrastructure and intermediate geomembrane cover will be placed on the sideslopes of Stage 1. Runoff from the intermediate geomembrane covering the sideslopes of Stage 1 will flow via a temporary stormwater ditch to ditches constructed along the inside edge of the perimeter berm of Cell 11 as previously described. The runoff will then be conveyed by way of perimeter downspouts to the stormwater structures located outside of the cell. The perimeter downspout locations are shown on Figure 3 and will be constructed of geomembrane and will include a riprap plunge pool at the bottom of the slope.

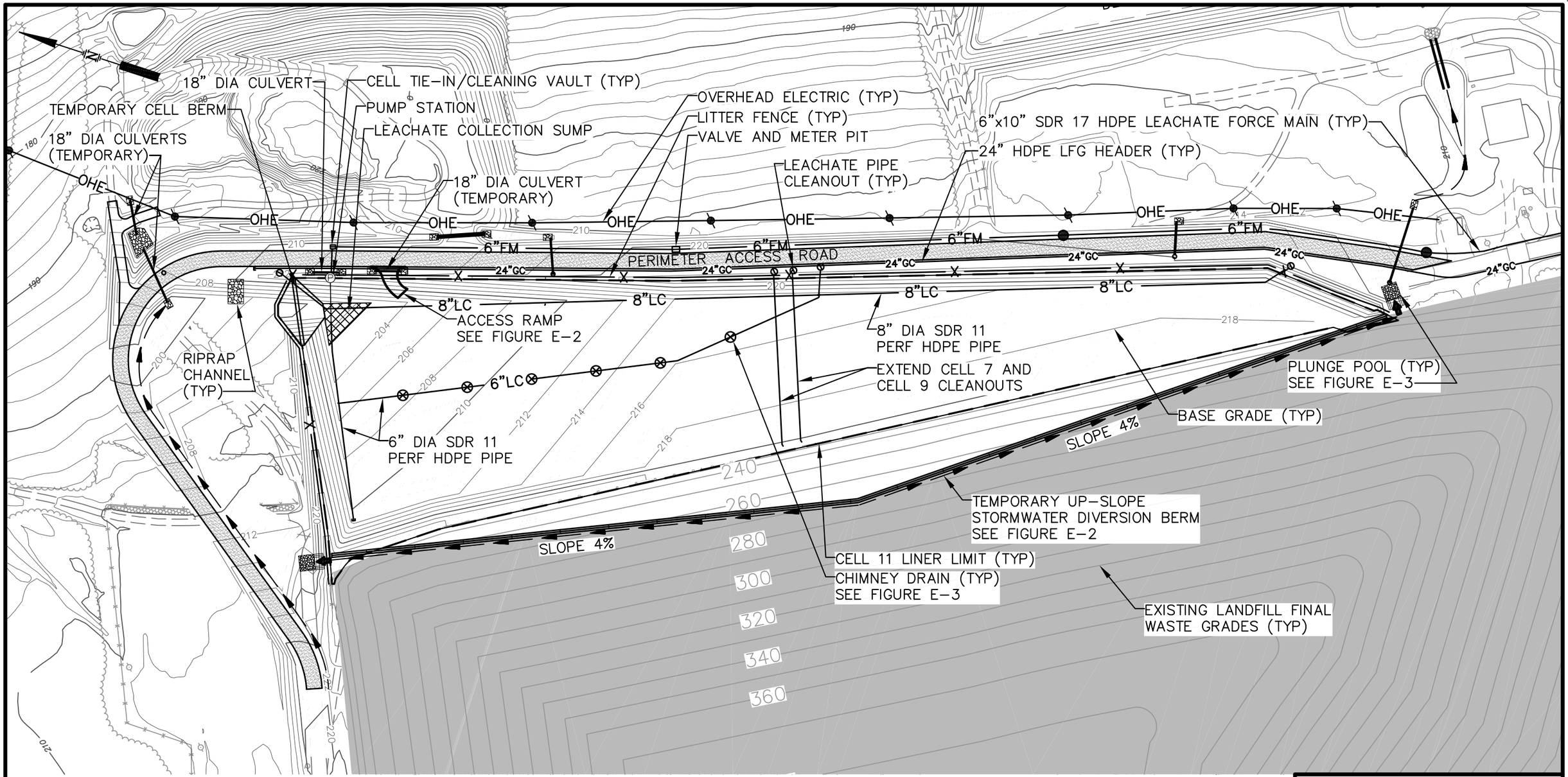
Operational controls and waste filling will progress for Stages 2, 3, 4, and 5 (as shown on Figures 3, 4, 5, and 6 respectively). As the waste elevation approaches the final elevation in each stage the mid-slope intermediate berms, leachate transport piping, leachate collection inlets, landfill gas infrastructure and intermediate geomembrane cover are installed to be ready for the operation of the next stage. The filling of Stages 2, 3, 4, and 5 will include the construction of the landfill access road which incorporates 2-foot high berms on the outside

edge of the road and a 2-foot deep stormwater ditch on the inside edge of the road and graded as shown on Figures 2 through 6. The waste below the landfill access road and any berms constructed of waste must be a high shear strength waste such as construction and demolition debris. High strength waste is defined as waste with adequate strength that it can be piled while maintaining sideslopes of 1 horizontal to 1 vertical. High strength wastes would not include materials such as sludges or other high moisture content materials.

The stormwater ditch along the roadway in the previously filled stages will be lined with temporary geomembrane cover. The stormwater ditch will direct clean runoff from the upper part of the covered landfill via culverts to the lower portion of the landfill where it is directed to the roadside ditch located along the perimeter access road. Upon completion of the cell development stages of Cell 11, intermediate cover will be in place over the entire waste surface of the developed area and maintained until the final cover is constructed over this area.

3.0 LANDFILL GAS INFRASTRUCTURE PLACEMENT

The landfill gas infrastructure will be placed as described in Appendix J of the Operations Manual and as shown on the Cell 11 Landfill Gas System Expansion Drawings in Appendix D of the Operations Manual.



LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- ——LC—— EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- CHIMNEY DRAIN
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

NOTES:

1. TOPOGRAPHY SHOWN OUTSIDE THE LIMIT OF LANDFILL FROM AERIAL SURVEY & PHOTO, NORRIDGEWOCK, MAINE. PHOTO DATE 12/31/14.
2. BASEGRADES WITHIN CELL 11 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
3. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
4. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM

75 0 150 FEET

DWG: C11-CELLDEV LMN: INITIAL CTB: SME-STD REV: 6/22/2015

FIGURE 1
CELL 11 DEVELOPMENT
INITIAL CONDITIONS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

SME
Sevee & Maher Engineers, Inc.
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

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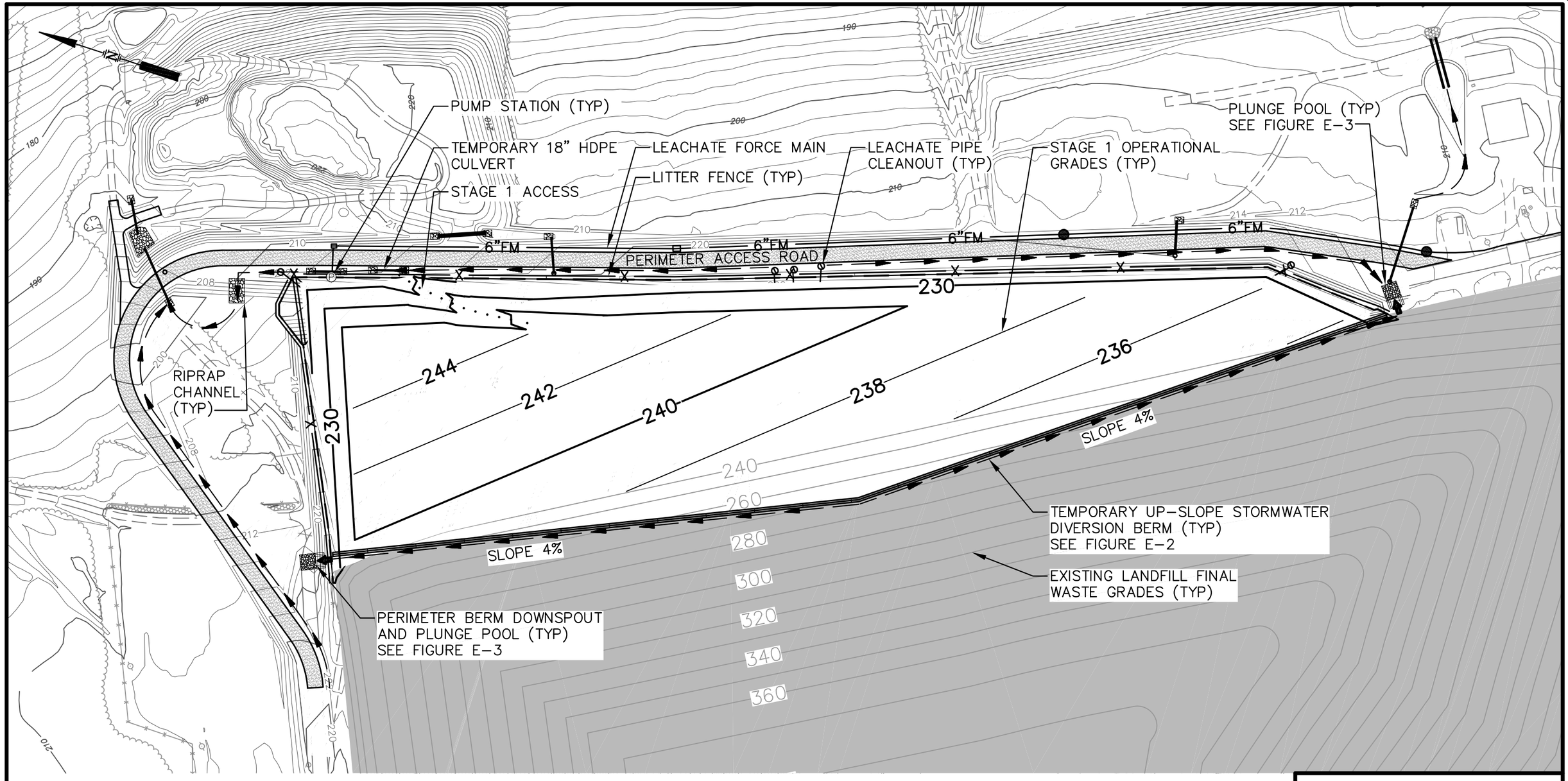

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- CHIMNEY DRAIN
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- CELL ACCESS ROAD

NOTES:

1. TOPOGRAPHY SHOWN OUTSIDE THE LIMIT OF LANDFILL FROM AERIAL SURVEY & PHOTO, NORRIDGEWOCK, MAINE. PHOTO DATE 12/31/14.
2. BASEGRADES WITHIN CELL 11 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
3. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.

75 0 150 FEET

DWG: C11-CELLDEV LMN: STAGE 1 CTB: SME-STD REV: 6/22/2015

FIGURE 2
CELL 11 DEVELOPMENT
STAGE 1
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

SME
Sevee & Maher Engineers, Inc.
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

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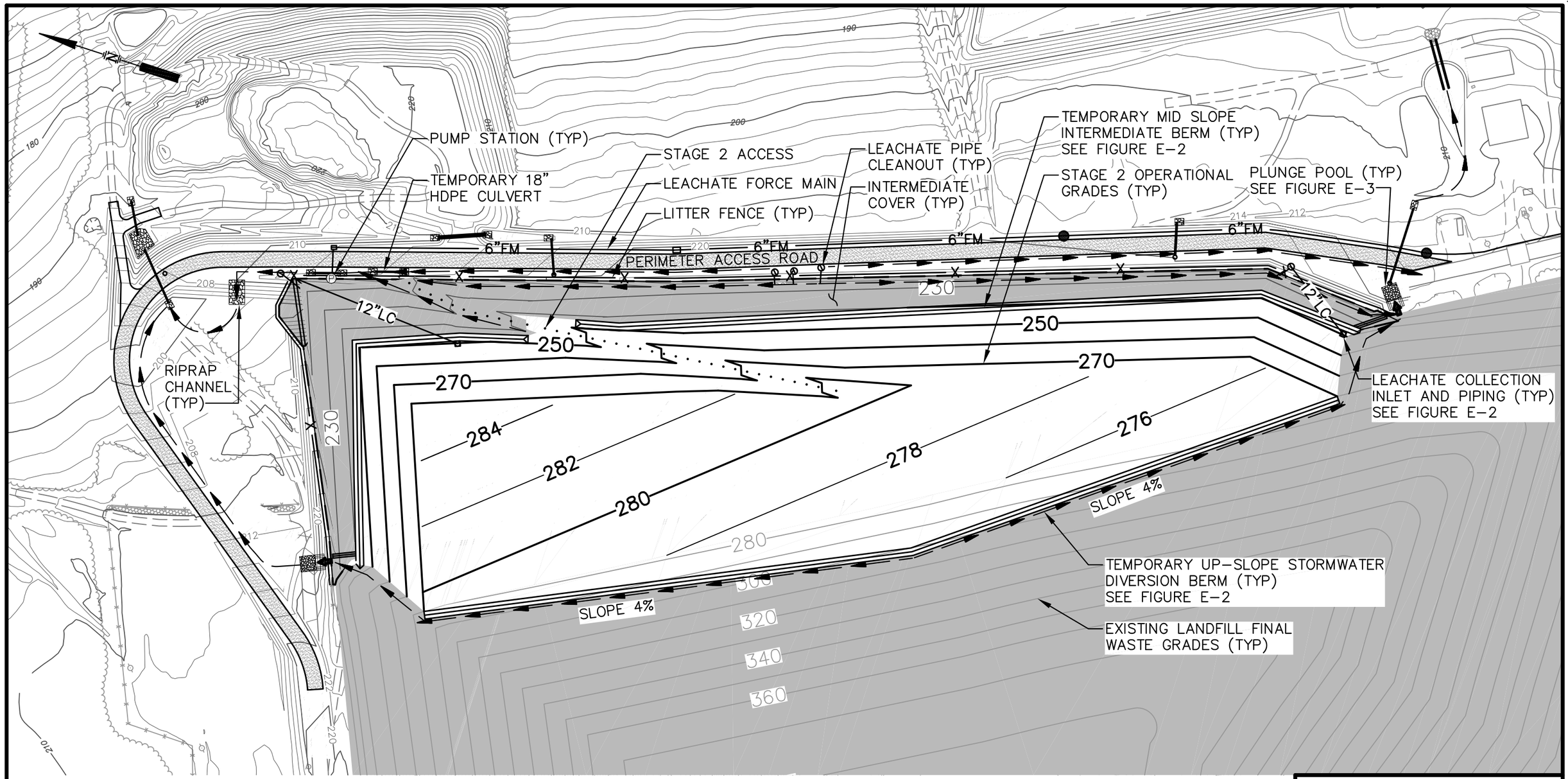

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- CHIMNEY DRAIN
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- CELL ACCESS ROAD

NOTES:

1. TOPOGRAPHY SHOWN OUTSIDE THE LIMIT OF LANDFILL FROM AERIAL SURVEY & PHOTO, NORRIDGEWOCK, MAINE. PHOTO DATE 12/31/14.
2. BASEGRADES WITHIN CELL 11 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
3. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.

75 0 150 FEET

DWG: C11-CELLDEV LMN: STAGE 2 CTB: SME-STD REV: 6/22/2015

FIGURE 3
CELL 11 DEVELOPMENT
STAGE 2
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

SME
Sevee & Maher Engineers, Inc.
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

\\Nserver\cfs\Casella\OldTownLandfill\Cell11\Acad\Figures\C11-CELLDEV.dwg, 6/22/2015 6:20:15 AM, sjm

PUMP STATION (TYP)

TEMPORARY 18" HDPE CULVERT

LEACHATE FORCE MAIN

LITTER FENCE (TYP)

LEACHATE PIPE CLEANOUT (TYP)

INTERMEDIATE COVER (TYP)

TEMPORARY MID SLOPE INTERMEDIATE BERM (TYP) SEE FIGURE E-2

STAGE 3 OPERATIONAL GRADES (TYP)

PLUNGE POOL (TYP) SEE FIGURE E-3

6"FM

PERIMETER ACCESS ROAD

12"LC

RIPRAP CHANNEL (TYP)

STAGE 3 ACCESS

24" DIA CULVERT

LEACHATE COLLECTION INLET AND PIPING (TYP) SEE FIGURE E-2

SLOPE 4%

TEMPORARY UP-SLOPE STORMWATER DIVERSION BERM (TYP) SEE FIGURE E-2

EXISTING LANDFILL FINAL WASTE GRADES (TYP)

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- CHIMNEY DRAIN
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- CELL ACCESS ROAD

NOTES:

1. TOPOGRAPHY SHOWN OUTSIDE THE LIMIT OF LANDFILL FROM AERIAL SURVEY & PHOTO, NORRIDGEWOCK, MAINE. PHOTO DATE 12/31/14.
2. BASEGRADES WITHIN CELL 11 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
3. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.

75 0 150 FEET

DWG: C11-CELLDEV LMN: STAGE 3 CTB: SME-STD REV: 6/22/2015

FIGURE 4
CELL 11 DEVELOPMENT
STAGE 3
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

SME
Sevee & Maher Engineers, Inc.
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

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PUMP STATION (TYP)

TEMPORARY 18" HDPE CULVERT

LEACHATE FORCE MAIN

LITTER FENCE (TYP)

LEACHATE PIPE CLEANOUT (TYP)

INTERMEDIATE COVER (TYP)

TEMPORARY MID SLOPE INTERMEDIATE BERM (TYP) SEE FIGURE E-2

STAGE 4 OPERATIONAL GRADES (TYP)

PLUNGE POOL (TYP) SEE FIGURE E-3

6"FM

PERIMETER ACCESS ROAD

12"LC

RIPRAP CHANNEL (TYP)

24" DIA CULVERT

STAGE 4 ACCESS

LEACHATE COLLECTION INLET AND PIPING (TYP) SEE FIGURE E-2

TEMPORARY UP-SLOPE STORMWATER DIVERSION BERM (TYP) SEE FIGURE E-2

EXISTING LANDFILL FINAL WASTE GRADES (TYP)

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- CHIMNEY DRAIN
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- CELL ACCESS ROAD

NOTES:

1. TOPOGRAPHY SHOWN OUTSIDE THE LIMIT OF LANDFILL FROM AERIAL SURVEY & PHOTO, NORRIDGEWOCK, MAINE. PHOTO DATE 12/31/14.
2. BASEGRADES WITHIN CELL 11 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
3. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.

75 0 150 FEET

DWG: C11-CELLDEV LMN: STAGE 4 CTB: SME-STD REV: 6/22/2015

FIGURE 5
CELL 11 DEVELOPMENT
STAGE 4
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

SME
Sevee & Maher Engineers, Inc.
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

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PUMP STATION (TYP)
TEMPORARY 18" HDPE CULVERT
LEACHATE FORCE MAIN
LITTER FENCE (TYP)
LEACHATE PIPE CLEANOUT (TYP)
INTERMEDIATE COVER (TYP)
PLUNGE POOL (TYP) SEE FIGURE E-3
6"FM
PERIMETER ACCESS ROAD
12"LC
RIPRAP CHANNEL (TYP)
24" DIA CULVERT
TEMPORARY MID SLOPE INTERMEDIATE BERM (TYP) SEE FIGURE E-2
STAGE 5 OPERATIONAL GRADES (TYP)
STAGE 4 ACCESS
LEACHATE COLLECTION INLET AND PIPING (TYP) SEE FIGURE E-2
EXISTING LANDFILL FINAL WASTE GRADES (TYP)
TEMPORARY UP-SLOPE STORMWATER DIVERSION BERM (TYP)

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- CHIMNEY DRAIN
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- CELL ACCESS ROAD

NOTES:

1. TOPOGRAPHY SHOWN OUTSIDE THE LIMIT OF LANDFILL FROM AERIAL SURVEY & PHOTO, NORRIDGEWOCK, MAINE. PHOTO DATE 12/31/14.
2. BASEGRADES WITHIN CELL 11 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
3. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.

75 0 150 FEET

DWG: C11-CELLDEV LMN: STAGE 5 CTB: SME-STD REV: 6/22/2015

FIGURE 6
CELL 11 DEVELOPMENT
STAGE 5
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

SME
Sevee & Maher Engineers, Inc.
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

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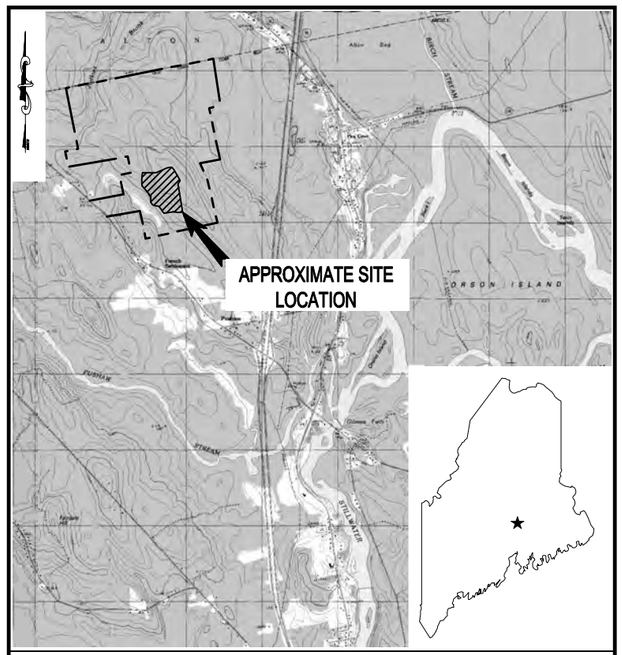
CELL 11 LANDFILL GAS SYSTEM EXPANSION DRAWINGS

JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE
JUNE 2015



FROM: USGS TOPOGRAPHIC MAP- OLD TOWN, MAINE (1988)

LOCUS PLAN
SCALE: 1"=1000'

SHEET INDEX

SHEET 1	EXISTING CONDITIONS PLAN
SHEET 2	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 1
SHEET 3	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 2
SHEET 4	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 3
SHEET 5	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 4
SHEET 6	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 5
SHEET 7	CROSS SECTION
SHEETS 8-11	DETAILS

STATE OF MAINE
Eric S. Steinhauser
10609
REGISTERED PROFESSIONAL ENGINEER

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
6/24/15

PREPARED FOR:

NEWSME LANDFILL OPERATIONS, LLC

JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PREPARED BY:

SANBORN HEAD

20 FOUNDRY STREET, CONCORD, NEW HAMPSHIRE 03301
(603) 229-1900 FAX (603) 229-1919

PROJ.#: 2536.27 "CELL 11 LANDFILL GAS SYSTEM EXPANSION DRAWINGS, JUNIPER RIDGE LANDFILL, OLD TOWN, MAINE" JUNE 2015.

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PLOT DATE: 6-24-15

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NOTES:

1. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.
2. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., OF NORRIDGEWOCK, MAINE. PHOTO DATE DECEMBER 31, 2014. VERTICAL DATUM: BRASS PLUG AT PUMP STATION. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY PLISGA & DAY LAND SURVEYORS, BANGOR, MAINE.

LEGEND:

EXISTING

- 10-FOOT CONTOUR
- 2-FOOT CONTOUR
- LIMIT OF WASTE CONTAINMENT
- CELL LIMIT
- EDGE OF ROAD
- LANDFILL GAS CONVEYANCE PIPE
- LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)
- TREELINE
- FENCE LINE
- GW-9 LANDFILL GAS EXTRACTION WELL
- GCT-21 COLLECTION TRENCH WELLHEAD
- COLLECTION TRENCH TERMINATION
- PIPE END CAP
- LEACHATE COLLECTION PIPE CLEANOUT
- LEACHATE COLLECTION INLET
- LANDFILL GAS EXTRACTION WELLHEAD
- RIPRAP

SANBORN HEAD

GRAPHICAL SCALE
100' 50' 0 100' 200'

STATE OF MAINE
Eric S. Steinhauser
10809
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: R. CLAY
PIC: E. STEINHAUSER
DATE: JUNE 2015

CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

EXISTING CONDITIONS PLAN

PROJECT NUMBER: 2536.27
SHEET NUMBER: 1 OF 11

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PLOT DATE: 8-24-15

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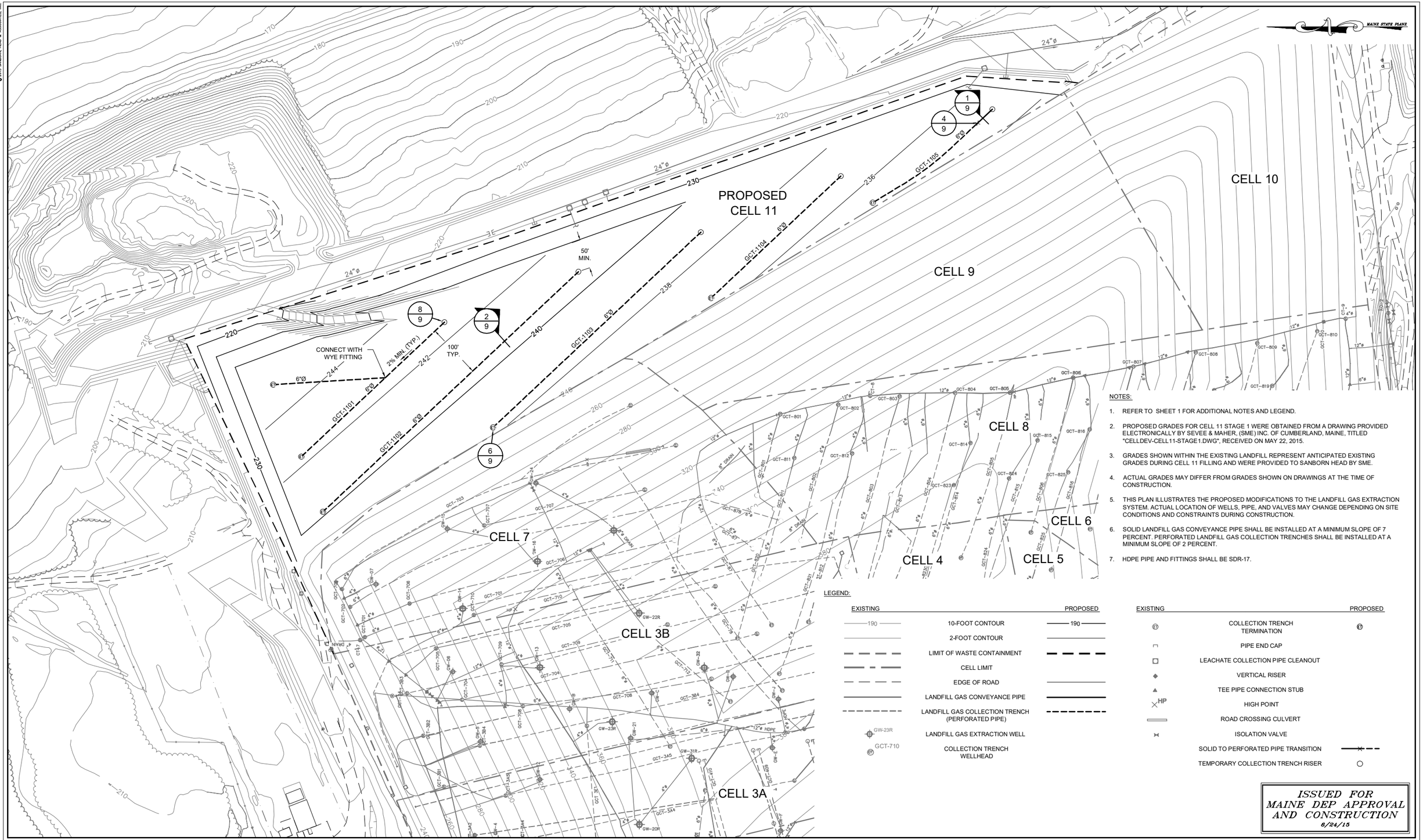

NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 11 STAGE 1 WERE OBTAINED FROM A DRAWING PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE, TITLED "CELLDEV-CELL11-STAGE1.DWG", RECEIVED ON MAY 22, 2015.
3. GRADES SHOWN WITHIN THE EXISTING LANDFILL REPRESENT ANTICIPATED EXISTING GRADES DURING CELL 11 FILLING AND WERE PROVIDED TO SANBORN HEAD BY SME.
4. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
5. THIS PLAN ILLUSTRATES THE PROPOSED MODIFICATIONS TO THE LANDFILL GAS EXTRACTION SYSTEM. ACTUAL LOCATION OF WELLS, PIPE, AND VALVES MAY CHANGE DEPENDING ON SITE CONDITIONS AND CONSTRAINTS DURING CONSTRUCTION.
6. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 7 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
7. HDPE PIPE AND FITTINGS SHALL BE SDR-17.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	
GCT-710	COLLECTION TRENCH WELLHEAD	

EXISTING		PROPOSED
GT	COLLECTION TRENCH TERMINATION	GT
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	
	SOLID TO PERFORATED PIPE TRANSITION	
	TEMPORARY COLLECTION TRENCH RISER	

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
6/24/15

SANBORN HEAD

GRAPHICAL SCALE
80' 40' 0' 80' 160'

STATE OF MAINE
Eric S. Steinhauser
10809
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: R. CLAY
PIC: E. STEINHAUSER
DATE: JUNE 2015

CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.27

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 1

SHEET NUMBER: 2 OF 11

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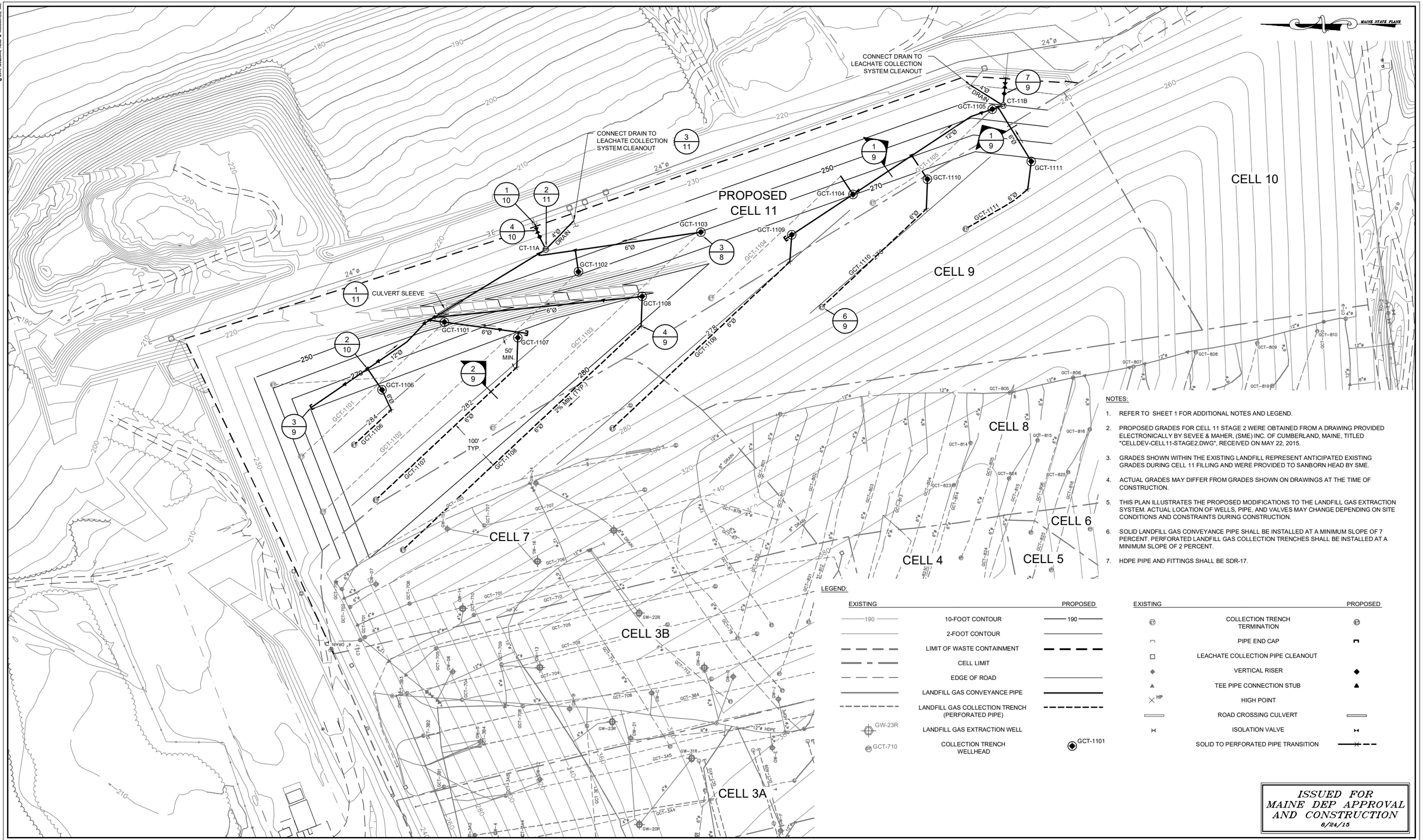

NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 11 STAGE 2 WERE OBTAINED FROM A DRAWING PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE, TITLED "CELLDEV-CELL11-STAGE2.DWG", RECEIVED ON MAY 22, 2015.
3. GRADES SHOWN WITHIN THE EXISTING LANDFILL REPRESENT ANTICIPATED EXISTING GRADES DURING CELL 11 FILLING AND WERE PROVIDED TO SANBORN HEAD BY SME.
4. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
5. THIS PLAN ILLUSTRATES THE PROPOSED MODIFICATIONS TO THE LANDFILL GAS EXTRACTION SYSTEM. ACTUAL LOCATION OF WELLS, PIPE, AND VALVES MAY CHANGE DEPENDING ON SITE CONDITIONS AND CONSTRAINTS DURING CONSTRUCTION.
6. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 7 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
7. HDPE PIPE AND FITTINGS SHALL BE SDR-17.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	
GCT-710	COLLECTION TRENCH WELLHEAD	GCT-1101

EXISTING		PROPOSED
GT	COLLECTION TRENCH TERMINATION	GT
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	
	SOLID TO PERFORATED PIPE TRANSITION	

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
6/24/15

SANBORN HEAD

GRAPHICAL SCALE
80' 40' 0' 80' 160'

STATE OF MAINE
Eric St. Steinhauser
10809
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: R. CLAY
PIC: E. STEINHAUSER
DATE: JUNE 2015

CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.27

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 2

SHEET NUMBER: 3 OF 11

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MAINE STATE PLANE

CELL 10

CELL 9

CELL 8

CELL 7

CELL 6

CELL 5

CELL 4

CELL 3B

CELL 3A

PROPOSED CELL 11

CULVERT SLEEVE

CT-11A

CT-11B

GW-062 GW-072 GW-098 GW-099 GW-100 GW-101 GW-102 GW-104 GW-106

GW-20R GW-21 GW-22R GW-23R GW-31R

GCT-1101 GCT-1102 GCT-1103 GCT-1104 GCT-1105 GCT-1106 GCT-1107 GCT-1108 GCT-1109 GCT-1110 GCT-1111 GCT-1112 GCT-1113 GCT-1114 GCT-1115 GCT-1116

GCT-701 GCT-702 GCT-703 GCT-704 GCT-705 GCT-706 GCT-707 GCT-708 GCT-709 GCT-710 GCT-711 GCT-712

GCT-801 GCT-802 GCT-803 GCT-804 GCT-805 GCT-806 GCT-807 GCT-808 GCT-809 GCT-810 GCT-811 GCT-812 GCT-813 GCT-814 GCT-815 GCT-816 GCT-817 GCT-818 GCT-819 GCT-820 GCT-821 GCT-822 GCT-823 GCT-824 GCT-825 GCT-826

GCT-3A1 GCT-3A2 GCT-3A3 GCT-3A4 GCT-3A5 GCT-3B1 GCT-3B2 GCT-3B3 GCT-3B4

2% MIN (TYP.)

100' TYP.

50' MIN.

NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 11 STAGE 3 WERE OBTAINED FROM A DRAWING PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE, TITLED "CELLDEV-CELL11-STAGE3.DWG", RECEIVED ON MAY 22, 2015.
3. GRADES SHOWN WITHIN THE EXISTING LANDFILL REPRESENT ANTICIPATED EXISTING GRADES DURING CELL 11 FILLING AND WERE PROVIDED TO SANBORN HEAD BY SME.
4. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
5. THIS PLAN ILLUSTRATES THE PROPOSED MODIFICATIONS TO THE LANDFILL GAS EXTRACTION SYSTEM. ACTUAL LOCATION OF WELLS, PIPE, AND VALVES MAY CHANGE DEPENDING ON SITE CONDITIONS AND CONSTRAINTS DURING CONSTRUCTION.
6. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 7 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
7. HDPE PIPE AND FITTINGS SHALL BE SDR-17.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-104
GCT-710	COLLECTION TRENCH WELLHEAD	GCT-1115

EXISTING		PROPOSED
	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	
	SOLID TO PERFORATED PIPE TRANSITION	

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
8/24/15

SANBORN HEAD

GRAPHICAL SCALE
80' 40' 0' 80' 160'

STATE OF MAINE
Eric S. Steinhauser
10809
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: R. CLAY
PIC: E. STEINHAUSER
DATE: JUNE 2015

CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.27

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 3

SHEET NUMBER: 4 OF 11

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MAINE STATE PLANE

PROPOSED CELL 11

CELL 10

CELL 9

CELL 8

CELL 7

CELL 6

CELL 5

CELL 4

CELL 3B

CELL 3A

NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 11 STAGE 4 WERE OBTAINED FROM A DRAWING PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE, TITLED "CELLDEV-CELL11-STAGE4.DWG", RECEIVED ON MAY 22, 2015.
3. GRADES SHOWN WITHIN THE EXISTING LANDFILL REPRESENT ANTICIPATED EXISTING GRADES DURING CELL 11 FILLING AND WERE PROVIDED TO SANBORN HEAD BY SME.
4. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
5. THIS PLAN ILLUSTRATES THE PROPOSED MODIFICATIONS TO THE LANDFILL GAS EXTRACTION SYSTEM. ACTUAL LOCATION OF WELLS, PIPE, AND VALVES MAY CHANGE DEPENDING ON SITE CONDITIONS AND CONSTRAINTS DURING CONSTRUCTION.
6. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 7 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
7. HDPE PIPE AND FITTINGS SHALL BE SDR-17.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-22	LANDFILL GAS EXTRACTION WELL	GW-105
GCT-807	COLLECTION TRENCH WELLHEAD	GCT-11xx

EXISTING		PROPOSED
GT	COLLECTION TRENCH TERMINATION	GT
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
6/24/15

SANBORN HEAD

GRAPHICAL SCALE
80' 40' 0' 80' 160'

STATE OF MAINE
Eric
R.
Steinhauser
10809
REGISTERED
PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: R. CLAY
PIC: E. STEINHAUSER
DATE: JUNE 2015

CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.27

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 4

SHEET NUMBER: 5 OF 11

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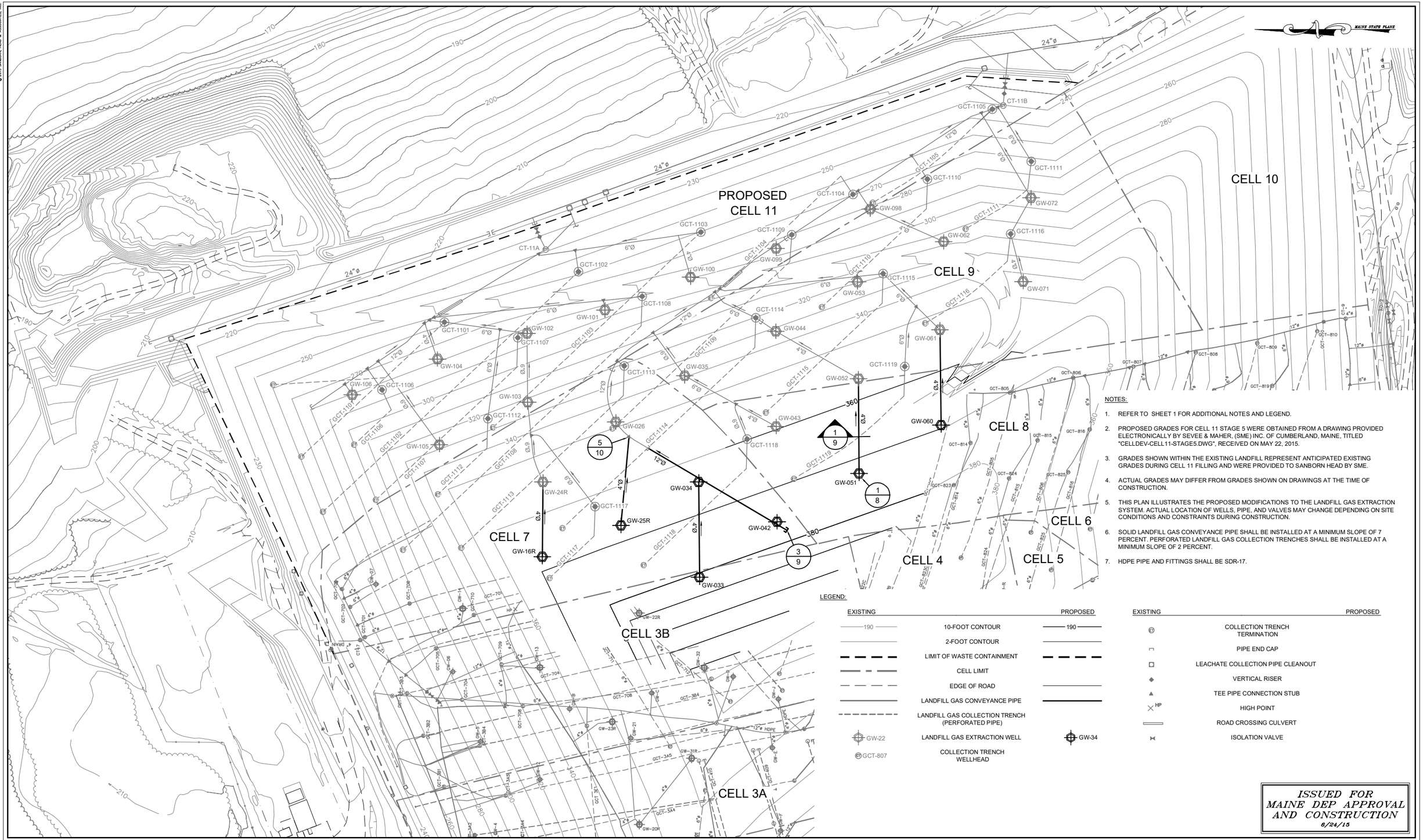

NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 11 STAGE 5 WERE OBTAINED FROM A DRAWING PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE, TITLED "CELLDEV-CELL11-STAGE5.DWG", RECEIVED ON MAY 22, 2015.
3. GRADES SHOWN WITHIN THE EXISTING LANDFILL REPRESENT ANTICIPATED EXISTING GRADES DURING CELL 11 FILLING AND WERE PROVIDED TO SANBORN HEAD BY SME.
4. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
5. THIS PLAN ILLUSTRATES THE PROPOSED MODIFICATIONS TO THE LANDFILL GAS EXTRACTION SYSTEM. ACTUAL LOCATION OF WELLS, PIPE, AND VALVES MAY CHANGE DEPENDING ON SITE CONDITIONS AND CONSTRAINTS DURING CONSTRUCTION.
6. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 7 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
7. HDPE PIPE AND FITTINGS SHALL BE SDR-17.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-22	LANDFILL GAS EXTRACTION WELL	GW-34
GCT-807	COLLECTION TRENCH WELLHEAD	

EXISTING		PROPOSED
	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
6/24/15

SANBORN HEAD

GRAPHICAL SCALE
80' 40' 0' 80' 160'

STATE OF MAINE
Eric S. Steinhauser
10809
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: R. CLAY
PIC: E. STEINHAUSER
DATE: JUNE 2015

CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.27

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 5

SHEET NUMBER: 6 OF 11

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PLOT DATE: 6-24-15

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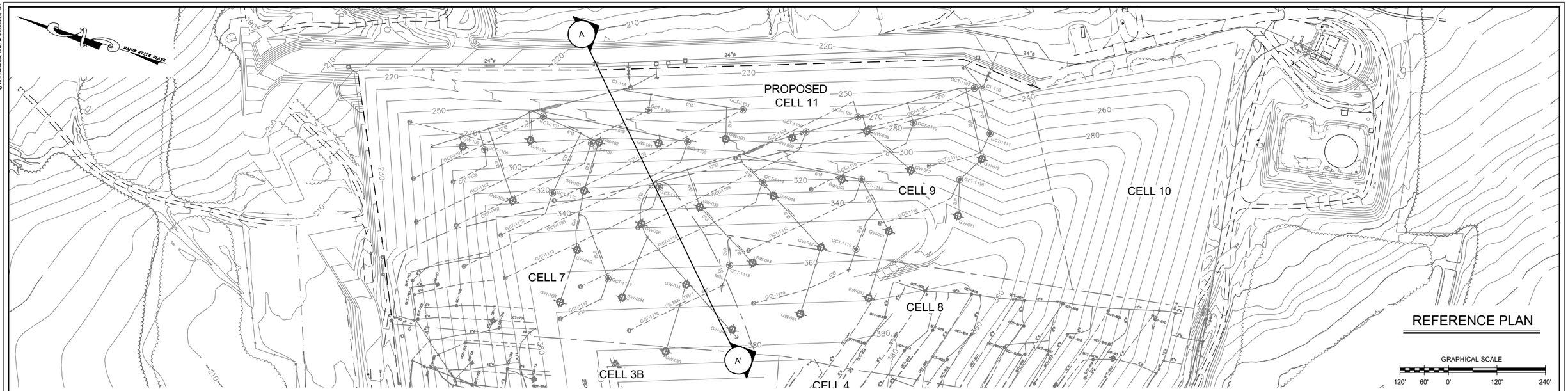

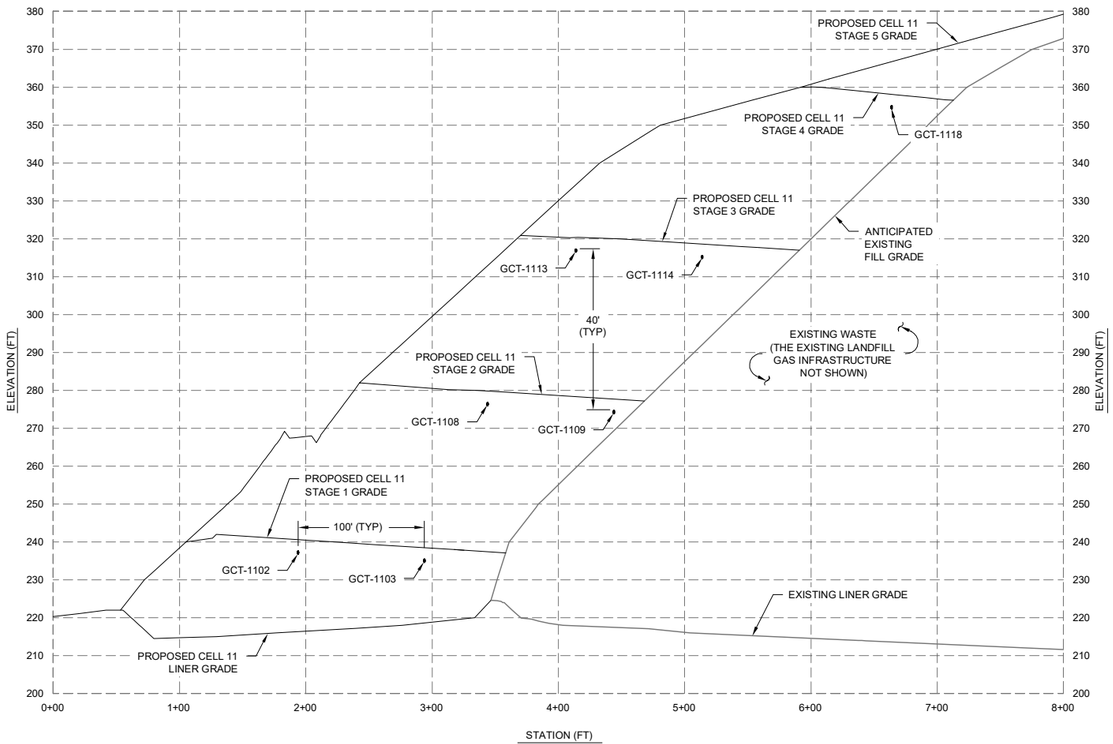

SECTION A-A'

VERTICAL SCALE
20' 10' 0 20' 40'
HORIZONTAL SCALE
60' 30' 0 60' 120'

NOTES:

1. THE CROSS SECTION SHOWN ON THIS SHEET ILLUSTRATES THE PROPOSED LAYOUT AND SPACING OF GAS COLLECTION TRENCHES IN CELL 11. ACTUAL GRADES MAY DIFFER FROM THE GRADES SHOWN AT THE TIME OF CONSTRUCTION. THE LOCATIONS OF COLLECTION TRENCHES MAY CHANGE DEPENDING ON SITE CONDITIONS AND CONSTRAINTS DURING CONSTRUCTION. VERTICAL WELLS ARE NOT SHOWN ON THE CROSS SECTION FOR CLARITY.
2. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
6/24/15

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE
Eric S. Steinhauser
10809
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: R. CLAY
PIC: E. STEINHAUSER
DATE: JUNE 2015

CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.27

CROSS SECTION

SHEET NUMBER: 7 OF 11

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Company: Sanborn, Head & Associates, Inc.
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Company: Sanborn, Head & Associates, Inc.
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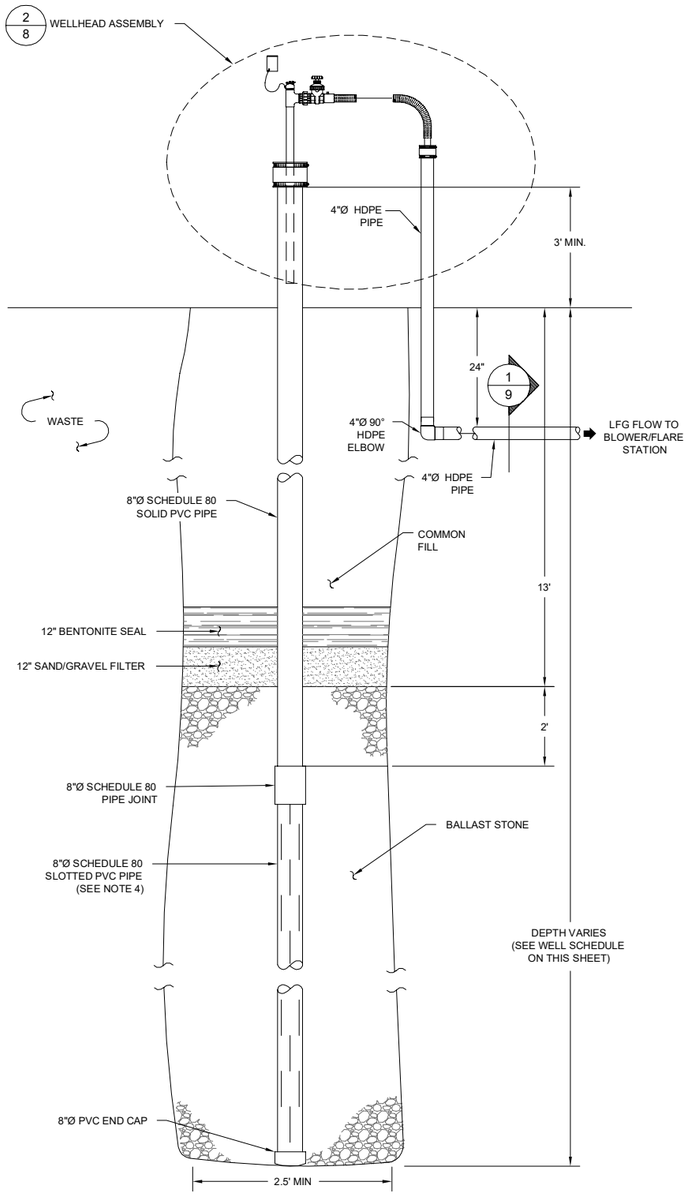


LFG EXTRACTION WELL DETAIL

1 NOT TO SCALE

NOTES:

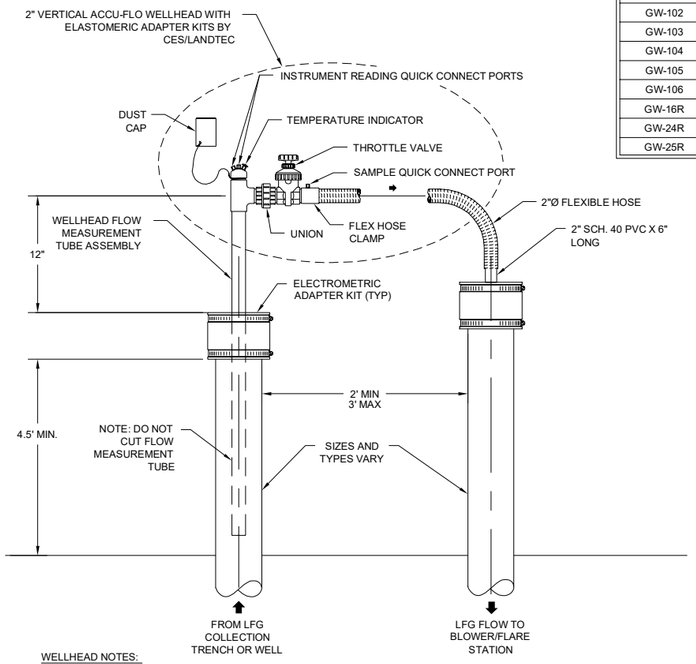
1. ALL HDPE PIPE SHALL BE SDR-17, UNLESS OTHERWISE NOTED.
2. ALL SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED OR AN ALTERNATIVE IS APPROVED BY THE ENGINEER.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.
4. PIPE PERFORATED WITH SLOTS ⅛" TO ¼" WIDE BY 8" LONG. FOUR SLOTS PER ROW SPACED 90° APART, WITH ADJACENT ROWS OFFSET BY 45°.

WELL SCHEDULE NOTES:

1. LFG EXTRACTION WELLS SHALL BE INSTALLED WITHIN ONE FOOT OF LISTED LOCATIONS.
2. A TEMPORARY BENCHMARK WITH ELEVATION SHALL BE ESTABLISHED AT EACH WELL PRIOR TO DRILLING.
3. 15 FEET OF SOLID RISER IS TO BE PROVIDED BELOW INTERMEDIATE COVER GRADES. THE INTENT IS TO PROVIDE 3 FEET OF STICK UP ABOVE FILL GRADES.
4. ELEVATIONS SHALL BE CONFIRMED AGAINST AS-BUILT TOP OF PRIMARY SAND GRADES AND FILL GRADES PRIOR TO CONSTRUCTION.

WELL SCHEDULE

WELL DESIGNATION	NORTHING	EASTING	BOTTOM OF WASTE (FT)	TOP OF EXISTING WASTE (FT)	TOTAL WELL DEPTH (FT)	BOTTOM OF WELL SCREEN (FT)	TOP OF WELL SCREEN (FT)	SCREEN LENGTH (FT)	TOP OF CASING ELEV. (FT)
GW-026	478922.2	926825.3	217.1	349.1	116.9	232.1	334.1	101.9	352.1
GW-033	478769.9	926542.9	214.8	380.4	150.6	229.8	365.4	135.6	383.4
GW-034	478771.5	926716.1	214.3	364.4	135.1	229.3	349.4	120.1	367.4
GW-035	478796.8	926909.2	217.6	339.1	106.6	232.6	324.1	91.6	342.1
GW-042	478629.0	926643.7	212.0	376.0	149.0	227.0	361.0	134.0	379.0
GW-043	478630.6	926816.9	213.5	359.6	131.1	228.5	344.6	116.1	362.6
GW-044	478631.1	926990.1	215.3	332.2	101.8	230.3	317.2	86.8	335.2
GW-051	478479.8	926731.7	210.8	372.7	146.8	225.8	357.7	131.8	375.7
GW-052	478480.9	926903.9	214.7	356.4	126.7	229.7	341.4	111.7	359.4
GW-053	478482.6	927079.8	214.5	320.6	91.1	229.5	305.6	76.1	323.6
GW-060	478330.7	926819.7	209.7	369.4	144.7	224.7	354.4	129.7	372.4
GW-061	478332.7	926992.9	211.8	353.0	126.1	226.8	338.0	111.1	356.0
GW-062	478326.0	927153.1	213.2	315.0	86.8	228.2	300.0	71.8	318.0
GW-071	478181.5	927080.5	210.5	345.0	119.4	225.5	330.0	104.4	348.0
GW-072	478167.1	927233.0	212.3	293.9	66.6	227.3	278.9	51.6	296.9
GW-098	478459.4	927212.4	220.9	281.5	45.6	235.9	266.5	30.6	284.5
GW-099	478630.8	927140.8	219.9	284.9	50.0	234.9	269.9	35.0	287.9
GW-100	478786.2	927088.7	218.6	283.9	50.3	233.6	268.9	35.3	286.9
GW-101	478941.9	927028.9	217.8	285.4	52.6	232.8	270.4	37.6	288.4
GW-102	479083.5	926986.5	217.0	282.9	50.8	232.0	267.9	35.8	285.9
GW-103	479082.4	926861.4	221.5	322.1	85.6	236.5	307.1	70.6	325.1
GW-104	479246.4	926939.8	213.0	278.4	50.4	228.0	263.4	35.4	281.4
GW-105	479243.1	926784.1	218.5	327.4	93.9	233.5	312.4	78.9	330.4
GW-106	479401.5	926874.9	209.8	280.5	55.7	224.8	265.5	40.7	283.5
GW-16R	479055.8	926580.2	216.3	367.5	136.2	231.3	352.5	121.2	370.5
GW-24R	479054.6	926716.2	217.6	354.8	122.2	232.6	339.8	107.2	357.8
GW-25R	478912.8	926637.2	215.2	367.1	136.9	230.2	352.1	121.9	370.1



WELLHEAD ASSEMBLY DETAIL

2 NOT TO SCALE

WELLHEAD NOTES:

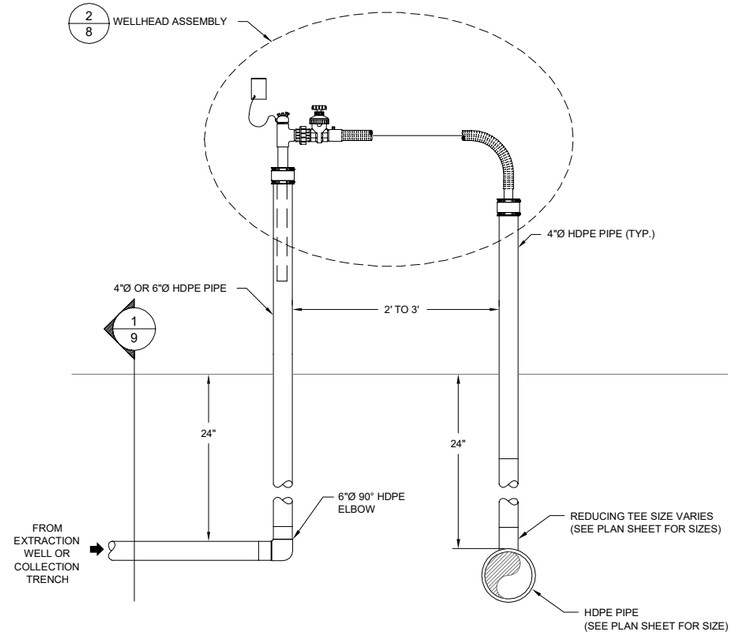
A. CES-LANDTEC ACCU-FLOW WELLHEAD SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL. INSTRUCTIONS SHALL BE THOROUGHLY READ BEFORE ATTEMPTING ASSEMBLY AND INSTALLATION OF WELLHEAD.

B. WELLHEAD AND FLOW MEASUREMENT TUBE ASSEMBLY SHALL BE COMPATIBLE WITH CES-LANDTEC GEM-2000 (LANDFILL GAS INSTRUMENT).

C. FOR FLEXIBLE CONNECTIONS TO PIPE, USE ONLY "IPS WELD-ON 795" PLASTIC PIPE CEMENT OR EQUAL APPROVED BY THE ENGINEER.

D. WARNING: DO NOT CUT THE FLOW MEASUREMENT TUBE ASSEMBLY. FAILURE TO HEED THIS WARNING WILL RESULT IN A DAMAGED OR INOPERATIVE WELLHEAD AND VOID THE WARRANTY. SUCH DAMAGE WOULD REQUIRE REPLACEMENT OF THE WELLHEAD AT THE CONTRACTOR'S EXPENSE.

E. ALLOW SUFFICIENT SLACK IN FLEX HOSE FOR PIPE EXPANSION AND CONTRACTION; AN EXTRA 8 TO 12 INCHES IS RECOMMENDED.



COLLECTION TRENCH WELLHEAD

3 NOT TO SCALE

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
6/24/15

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE
Eric S. Steinhauser
10809
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R.CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: R. CLAY
PIC: E. STEINHAUSER
DATE: JUNE 2015

CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.27

DETAILS

SHEET NUMBER: 8 OF 11

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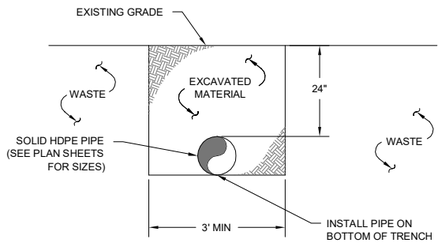
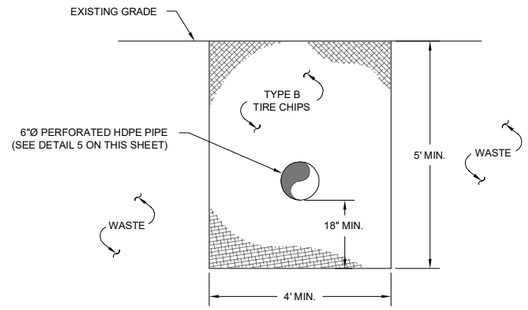


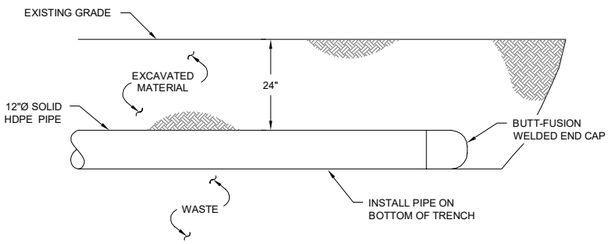
SOLID PIPE TRENCH

1 NOT TO SCALE



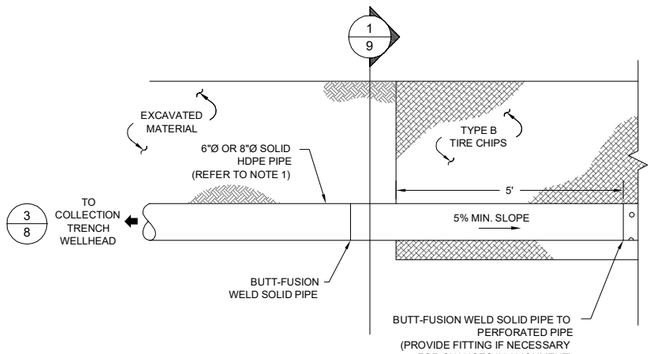
PERFORATED PIPE TRENCH

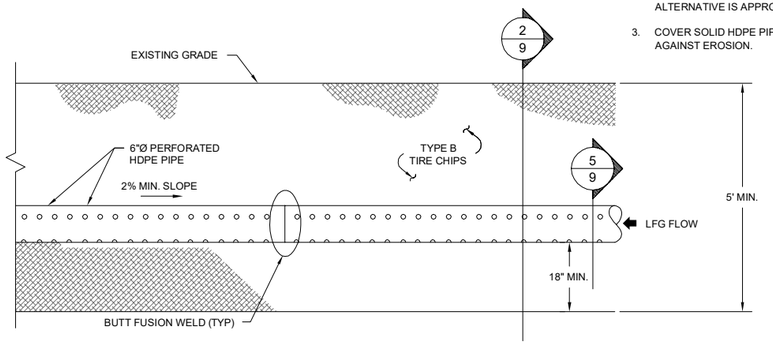
2 NOT TO SCALE



TEMPORARY PIPE TERMINATION

3 NOT TO SCALE



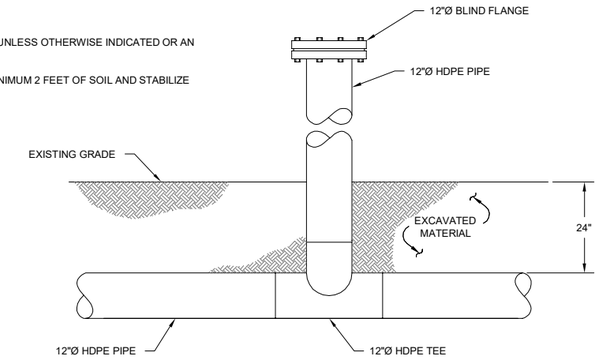


LFG COLLECTION TRENCH TRANSITION

4 NOT TO SCALE

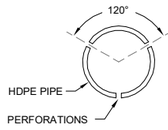
NOTES:

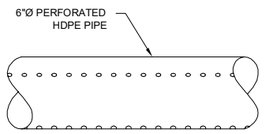
1. ALL HDPE PIPE SHALL BE SDR-17.
2. ALL SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED OR AN ALTERNATIVE IS APPROVED BY THE ENGINEER.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.



VERTICAL RISER

7 NOT TO SCALE



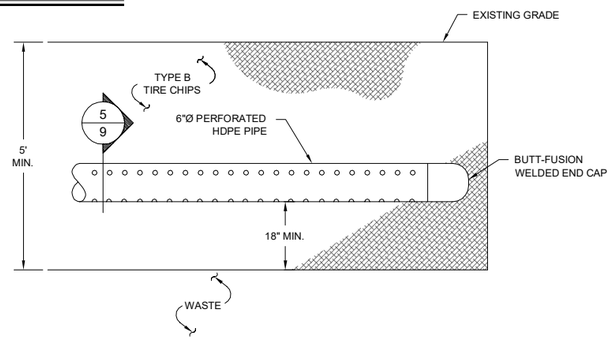


NOTE:

1. HOLES SHALL BE 1/2"Ø DRILLED HOLES SPACED 12" APART ALONG THE LENGTH OF THE PIPE OR APPROVED EQUIVALENT BY OWNER.

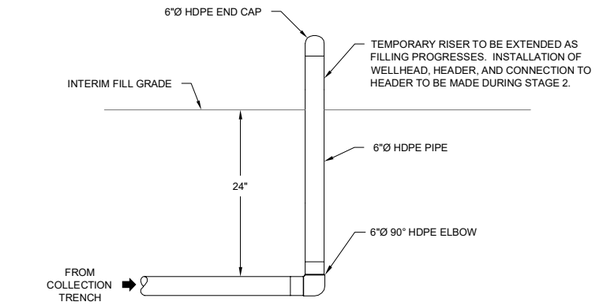
TYPICAL PERFORATED PIPE

5 NOT TO SCALE



COLLECTION TRENCH TERMINATION

6 NOT TO SCALE



TEMPORARY COLLECTION TRENCH RISER

8 NOT TO SCALE

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
6/24/15

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE — Eric S. Steinhauser — 10809 — REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: R. CLAY
PIC: E. STEINHAUSER
DATE: JUNE 2015

CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.27

DETAILS

SHEET NUMBER: 9 OF 11

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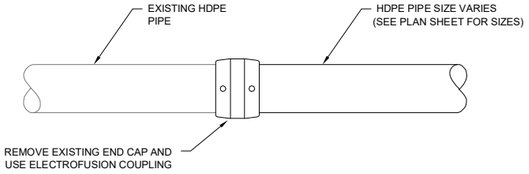
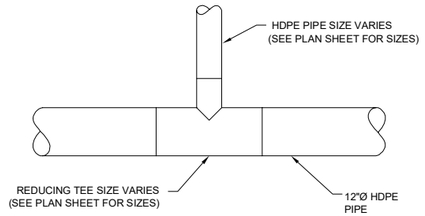


EXISTING CONVEYANCE PIPE CONNECTION

1

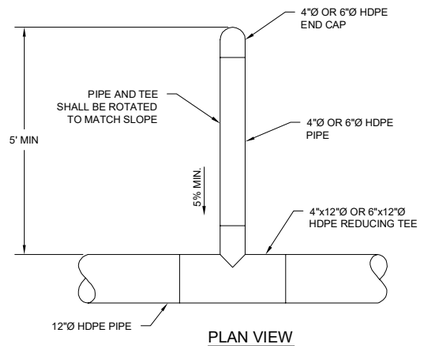
NOT TO SCALE



"TEE" CONNECTION

2

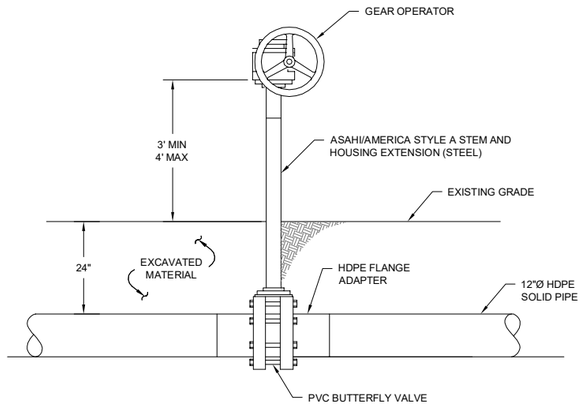
NOT TO SCALE



TEE PIPE CONNECTION STUB

3

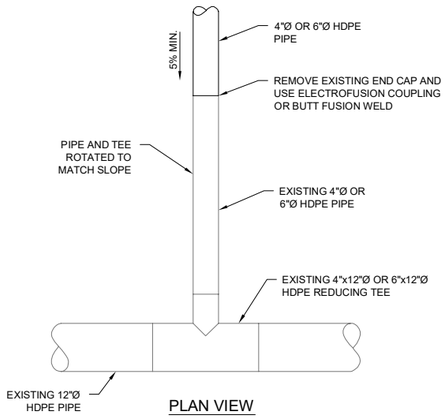
NOT TO SCALE



LFG FLOW CONTROL VALVE

4

NOT TO SCALE



CONNECTION TO TEE PIPE STUB

5

NOT TO SCALE

NOTES:

1. ALL HDPE PIPE SHALL BE SDR-17.
2. ALL SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED OR AN ALTERNATIVE IS APPROVED BY THE ENGINEER.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
6/24/15

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE
Eric S. Steinhauser
10809
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: E. STEINHAUSER
PROJECT MGR: R. CLAY
PIC: E. STEINHAUSER
DATE: JUNE 2015

CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.27

DETAILS

SHEET NUMBER: 10 OF 11

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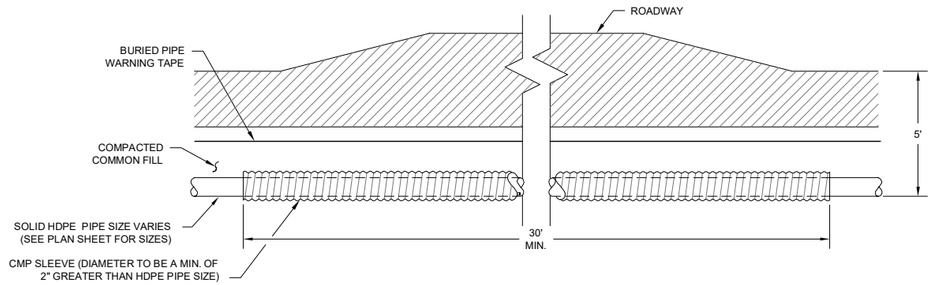
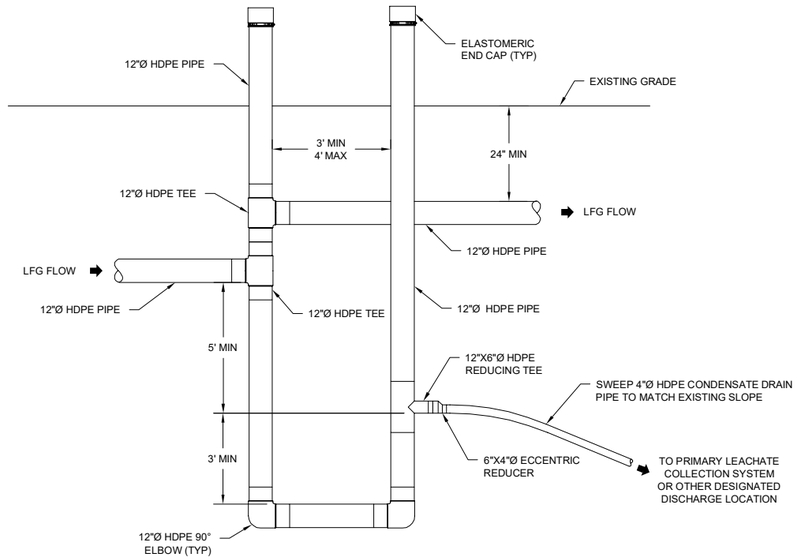


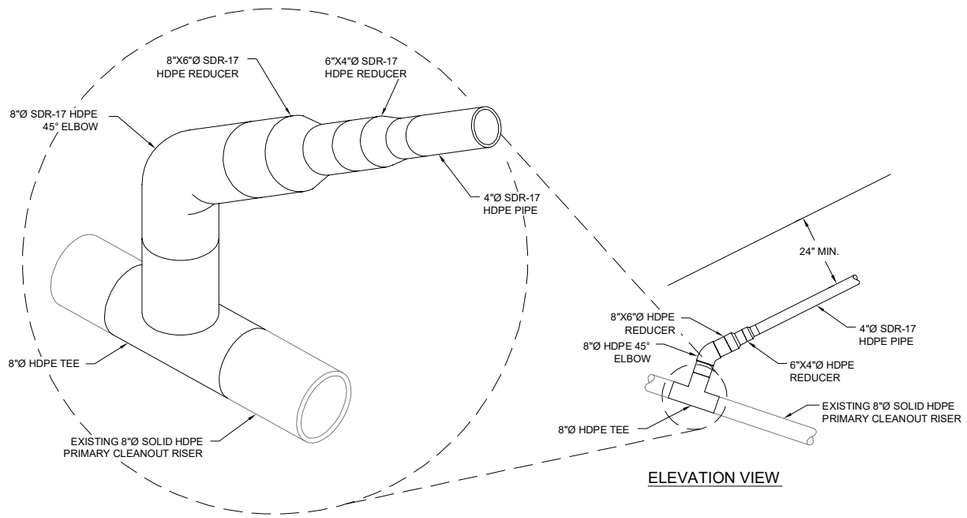
1 ROAD CROSSING PIPE SLEEVE

NOT TO SCALE



2 CONDENSATE TRAP

NOT TO SCALE



ELEVATION VIEW

3 CONDENSATE DRAIN PIPE CONNECTION TO LEACHATE COLLECTION INLET/CLEANOUT SECTION

NOT TO SCALE

NOTES:

1. ALL HDPE PIPE SHALL BE SDR-17.
2. ALL SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED OR AN ALTERNATIVE IS APPROVED BY THE ENGINEER.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
6/24/15

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE
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CELL 11 LFG SYSTEM EXPANSION DRAWINGS
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.27

DETAILS

SHEET NUMBER: 11 OF 11

IMAGES: E:\Sheets\sec4\IEE C:\Program Files (x86)\Adobe\Acrobat 11.0\PDFMaker\Settings\PDFMaker.joboptions
XREFs: P:\2536\2536.27\Acad\Xref\ACAD11\LFG\Cell11LFGSystemExpansion.dwg P:\2536\2536.27\Drawings\Xref\ACAD11\11-SC-02-07.dwg
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11-SC-04-11 Plotted: 25 JUN 2015 - 8:43:41 AM EDT by Steinhauser, Eric
PLOTTED IN: 11x17

CELL 12 Development / Landfill Gas System Expansion Drawings

JUNIPER RIDGE LANDFILL
CELL 12 DEVELOPMENT

1.0 CELL 12 SYSTEM OVERVIEW

Cell 12 is approximately 9.6 acres in size and provides approximately 1,152,000 cubic yards of disposal capacity. Cell 12 abut the existing Cells 3B, 7, and 11 and its liner system will transition and connect to the liner systems of these three cells. The location and base grades for Cell 12 are shown on Figure 12-1. Cell 12 will be constructed in 2020 to be available for waste placement in 2020.

The Cell 12 liner system will consist of a composite leachate collection and primary liner, a leak detection system, and a secondary liner.

The composite leachate collection and primary liner will consist of the following components:

- An 80-mil high-density polyethylene (HDPE) textured geomembrane;
- A geosynthetic clay liner (GCL); and
- A 12-inch clay barrier soil layer (hydraulic conductivity (K) less than or equal to $1x10^{-7}$ cm/sec).

The leak detection system has been designed to detect leaks within 30 days and will consist of the following components:

- A 12-inch layer of sand ($K \geq 5x10^{-3}$ cm/sec);
- A network of 6-inch diameter perforated HDPE pipe;
- A geocomposite drainage net; and
- A dedicated leak detection pump system.

The secondary liner will consist of a 60-mil HDPE textured geomembrane. Directly below the secondary liner system will be 12 inches of clay with a hydraulic conductivity (K) less than or equal to $1x10^{-7}$ cm/sec.

Leachate Collection

The Cell 12 leachate collection system consists of a 12-inch layer of granular material with a hydraulic conductivity greater than 5 $x10^{-3}$ cm/sec, perforated HDPE laterals (minimum diameter 6 inches) and a perimeter transport pipe (minimum diameter 8 inches), stone pipe filters, and a drainage geocomposite. The leachate collection system is a gravity drain system which flows to the Cell 12 temporary collection sump and pump system located at the northeast corner of the Cell. The Cell 11 collection sump area will be connected to Cell 12, and the Cell 11 leachate pumps will be relocated to the Cell 12 pump station. Cleanouts are provided for the Cell 12 leachate laterals and perimeter transport piping.

The Cell 12 leachate pump system consists of a primary 5-horsepower pump, located in the bottom of the sump and accessed through a 24-inch riser pipe, and a secondary 5-horsepower pump, located in a separate 24-inch riser pipe directly adjacent to the primary 24-inch riser. The primary pump has the ability to pump design flows, while the secondary pump serves as a backup . Both pumps are piped through a header system to a dual-containment leachate force main located in the perimeter berm. The leachate generation and pumping calculations are provided in Appendix A-2 of the Cell 12 Design Report. The force main allows the leachate to be pumped from the Cell 12 leachate collection sump to the 900,000-gallon aboveground storage tank (AST) for temporary storage prior to trucking the leachate off-site for treatment.

Leak Detection

Liquids that collect in the Cell 12 leak detection layer drain to the leak detection sump, located on the northeast side of the cell. The sump has a 1 horsepower pump that pumps liquids into the leachate collection sump. The leak detection pump system is equipped with a flow meter and sample port to monitor leak detection flows and water quality. The leak detection system has the hydraulic capacity to transmit the predicted flows associated with the Cell 12 primary liner action leakage rate and rapid and large leakage rate. A small wooden structure will be built over both the leachate and leak detection piping to protect them from the elements.

2.0 CELL 12 DEVELOPMENT

Initial conditions prior to waste placement into Cell 12 are shown on Figure 12-1. After the initial placement of the 5-foot soft/frost-protection layer within Cell 12, waste placement and operations of Cell 12 will be performed in accordance with the operating procedures contained in Section 7.0 of the JRL Operations Manual. The five (5) stages of waste placement are shown on Figures 12-2 through 12-6, respectively. Associated operational details are shown on Figures 12-7, 12-8 and 12-9: final cover termination, final cover system, cover system anchor trench, and intermediate berm base liner connection (Figure 12-7); leachate collection inlet, temporary mid-slope intermediate berm, perimeter berm intermediate cover, temporary up-slope stormwater diversion berm and Cell access road entrance ramp (Figure 12-8), and downspout section, perimeter berm downspout profile and plunge pool. Access to Cell 12 will initially be from the northeast corner off the access road located on the eastern perimeter berm, and from the southwest corner of the Cell off the existing access road. The road will be constructed over the perimeter berm as detailed on Figure 12-8.

Portions of Cell 12 waste placement will piggy-back onto the northern sideslopes of Cells 3B, 7 and 11. Prior to filling against the northern sideslope of the existing Cells, temporary cover materials will be removed to the height of the next waste lift, and temporary up-slope stormwater diversion berms will be constructed to divert clean stormwater runoff away from the active operating area as detailed on Figure 12-8. During the initial waste placement operations along the perimeter of Cell 12, the waste will

be placed to allow the infiltration of stormwater that comes in contact with exposed waste to drain into the perimeter drainage stone or sand. After the intermediate geomembrane cover is installed during the first stage of Cell 12 construction, this area will become a temporary stormwater drainage ditch that will direct stormwater to the perimeter berm downspout and plunge pool shown on Figure 12-1.

Waste placement operations in Cell 12 will progress until Stage 1 grades are achieved as shown on Figure 12-2. At the completion of the filling of Stage 1 and prior to Stage 2 filling, mid-slope intermediate berms, leachate transport piping and leachate collection inlets will be located as shown on Figure 12-3. Horizontal gas collection trenches will be installed and connected to the Site's gas management infrastructure, and the intermediate geomembrane cover will be placed on the sideslopes of Stage 1. Runoff from the intermediate geomembrane covering the sideslopes of Stage 1 will flow via a temporary stormwater ditch to ditches constructed along the inside edge of the perimeter berm of Cell 12 as previously described. The runoff will then be conveyed by way of perimeter downspout to the stormwater structures located outside of the Cell. The perimeter downspout will be constructed of geomembrane and will include a riprap plunge pool at the bottom of the slope as shown on the detail on Figure 12-9.

Operational controls and waste filling will progress for Stages 2, 3, 4, and 5 (as shown on Figures 12-3, 12-4, 12-5, and 12-6, respectively). As the waste elevation approaches the final elevation in each stage, the mid-slope intermediate berms, leachate transport piping, leachate collection inlets, landfill gas infrastructure and intermediate geomembrane cover are installed to be ready for the operation of the next stage. The filling of Stages 2, 3, 4, and 5 will include the construction of the landfill access road which incorporates a 2-foot high berm on the outside edge of the access road and a 2-foot deep stormwater ditch on the inside edge of the road and graded as shown on Figures 12-2 through 12-6. The waste below the landfill access road and any berms constructed of waste must be a high shear strength waste such as construction and demolition debris. High strength waste is defined as waste with adequate strength such that it can be piled while maintaining sideslopes of 1 horizontal to 1 vertical (1H:1V). High strength wastes would not include materials such as sludges or other high moisture content materials.

The stormwater ditch along the landfill access road will be lined with temporary geomembrane cover following completion of Cell 12 Stage 5 waste placement. The stormwater ditch will direct clean runoff from the upper portion of the covered landfill via culverts to the lower portion of the landfill where it is directed to the stormwater ditch located along the landfill access road. Upon completion of the cell development stages of Cell 12, intermediate cover will be in place over the entire waste surface of the developed area and maintained until the final cover is constructed over this area.

3.0 LANDFILL GAS INFRASTRUCTURE PLACEMENT

The landfill gas infrastructure will be placed as described in Appendix J of the JRL Operations Manual and as shown on the Landfill Gas Development Plans included in Appendix D of the Design Report.

CELL 12

CELL 11
(WITH INTERMEDIATE GEOMEMBRANE COVER)

CELL 12 LINED AREA = 9.6 ACRES

36" DIA CULVERT
TEMPORARY CELL BERM
24" DIA HDPE LFG HEADER PIPE (TYP)
6"x10" LEACHATE FORCE MAIN (TYP)
CELL 12 PUMP STATION
SMH #27
CELL TIE-IN FORCE MAIN METER AND VALVE PIT
EMH #27
UNDERGROUND ELECTRIC (TYP)
OW-605A
CELL 12 LINER LIMIT (TYP)
CELL 12 LEACHATE SUMP
ACCESS RAMP (TYP) SEE FIGURE 12-8
TEMPORARY MAINTENANCE ROAD
(2) 24" DIA CULVERTS
LEACHATE COLLECTION HEADER (TYP)
TO DETENTION POND #10
EXISTING MONITORING WELL (TYP)
OW-604A
LITTER FENCE (TYP)
BASE GRADE (TYP)
CELL 11 PUMP STATION
SMH #26
ACCESS RAMP (TYP) SEE FIGURE 12-8
LEACHATE COLLECTION LATERAL (TYP)
CB AND 24" DIA CULVERT
36" DIA CULVERT
LEACHATE PIPE CLEANOUT (TYP)
OW-603B
36" DIA CULVERT
CELL 11 ACCESS (TYP)
PERIMETER BERM DOWNSPOUT AND PLUNGE POOL (TYP) SEE FIGURE 12-9
TEMPORARY UPSLOPE STORMWATER DIVERSION BERM SEE FIGURE 12-8
CELL 11 STAGE 4 OPERATIONAL WASTE GRADES (TYP)

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/24/19. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.

   STANDARD PRACTICE DICTATES THAT PLANS COMPILED IN THIS MANNER SHOULD BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
2. CONTOURS WITHIN LIMIT OF WORK AND WITHIN LANDFILL FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED NOVEMBER 15, 2019. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC (SME) OF CUMBERLAND, MAINE USING PROPELLER AEROPOINTS, DATED NOVEMBER 15, 2019:
   HORIZONTAL DATUM - NAD83 MAINE, EAST, US FT.
   VERTICAL DATUM - NAVD 88, US FT.
3. BASEGRADES WITHIN CELL 12 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
4. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
5. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM

25 0 50 100 FEET

FIGURE 12-1
CELL 12 - DEVELOPMENT
INITIAL CONDITIONS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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DWG: C12-STAGES(1-5) LMN: INITIAL CTB: SME-STD REV: 12/23/2019

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LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- LANDFILL ACCESS

NOTES:

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   VERTICAL DATUM - NAVD 88, US FT.

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4. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.

5. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM

ESTIMATED STAGE 1 CAPACITY
176,300 CY INCLUDING SOFT LAYER VOLUME = 66,700 CY

25 0 50 100 FEET

FIGURE 12-2
CELL 12 DEVELOPMENT - STAGE 1
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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PERIMETER BERM INTERMEDIATE GEOMEMBRANE DETAIL SEE FIGURE 12-8

INTERMEDIATE COVER (TYP)

TEMPORARY MID-SLOPE INTERMEDIATE BERM (TYP) SEE FIGURE 12-8

STAGE 2 OPERATIONAL WASTE GRADES (TYP)

LEACHATE COLLECTION INLET AND PIPING SEE FIGURE 12-8

LEACHATE PIPE CLEANOUT (TYP)

CELL 12 PUMP STATION

30" DIA CULVERT

LANDFILL ACCESS (TYP)

TO DETENTION POND #10

CELL 11 PUMP STATION

CELL 12 STAGE 2 ACCESS (TYP)

CELL 11 STAGE 4 OPERATIONAL WASTE GRADES (TYP)

36" DIA CULVERT

WESTERN LANDFILL ACCESS

LEACHATE PIPE CLEANOUT (TYP)

LITTER FENCE (TYP)

PERIMETER BERM DOWNSPOUT AND PLUNGE POOL (TYP) SEE FIGURE 12-9

TEMPORARY UPSLOPE STORMWATER DIVERSION BERM SEE FIGURE 12-8

CELL 11
(WITH INTERMEDIATE GEOMEMBRANE COVER)

CELL 11 STAGE 4 DEVELOPMENT GRADES (TYP)

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- LANDFILL ACCESS

NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/24/19. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.

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3. BASEGRADES WITHIN CELL 12 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.

4. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.

5. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM

ESTIMATED STAGE 2 CAPACITY
339,800 CY INCLUDING SOFT LAYER VOLUME = 9,900 CY

25 0 50 100 FEET

FIGURE 12-3
CELL 12 DEVELOPMENT - STAGE 2
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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PERIMETER BERM INTERMEDIATE GEOMEMBRANE DETAIL SEE FIGURE 12-8

INTERMEDIATE COVER (TYP)

TEMPORARY MID-SLOPE INTERMEDIATE BERM SEE FIGURE 12-8

LEACHATE COLLECTION INLET AND PIPING SEE FIGURE 12-8

WESTERN LANDFILL ACCESS

LITTER FENCE (TYP)

PERIMETER BERM DOWNSPOUT AND PLUNGE POOL (TYP) SEE FIGURE 12-9

TEMPORARY UPSLOPE STORMWATER DIVERSION BERM SEE FIGURE 12-8

STAGE 3 OPERATIONAL WASTE GRADES (TYP)

STAGE 3 LANDFILL ACCESS (TYP)

LEACHATE COLLECTION INLET AND PIPING SEE FIGURE 12-8

CELL 11 STAGE 4 DEVELOPMENT GRADES (TYP)

CELL 11
(WITH INTERMEDIATE GEOMEMBRANE COVER)

OW-605A

LEACHATE PIPE CLEANOUT (TYP)

CELL 12 PUMP STATION

30" DIA CULVERT

TO DETENTION POND #10

LANDFILL ACCESS (TYP)

OW-604A

CELL 11 PUMP STATION

CELL 12 STAGE 2 ACCESS (TYP)

30" DIA CULVERT

CELL 11 STAGE 4 OPERATIONAL WASTE GRADES (TYP)

OW-603B

36" DIA CULVERT

PILE

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- LANDFILL ACCESS

NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/24/19. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.

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   VERTICAL DATUM - NAVD 88, US FT.

3. BASEGRADES WITHIN CELL 12 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.

4. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.

5. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM

ESTIMATED STAGE 3 CAPACITY
305,900 CY

25 0 50 100 FEET

FIGURE 12-4
CELL 12 DEVELOPMENT - STAGE 3
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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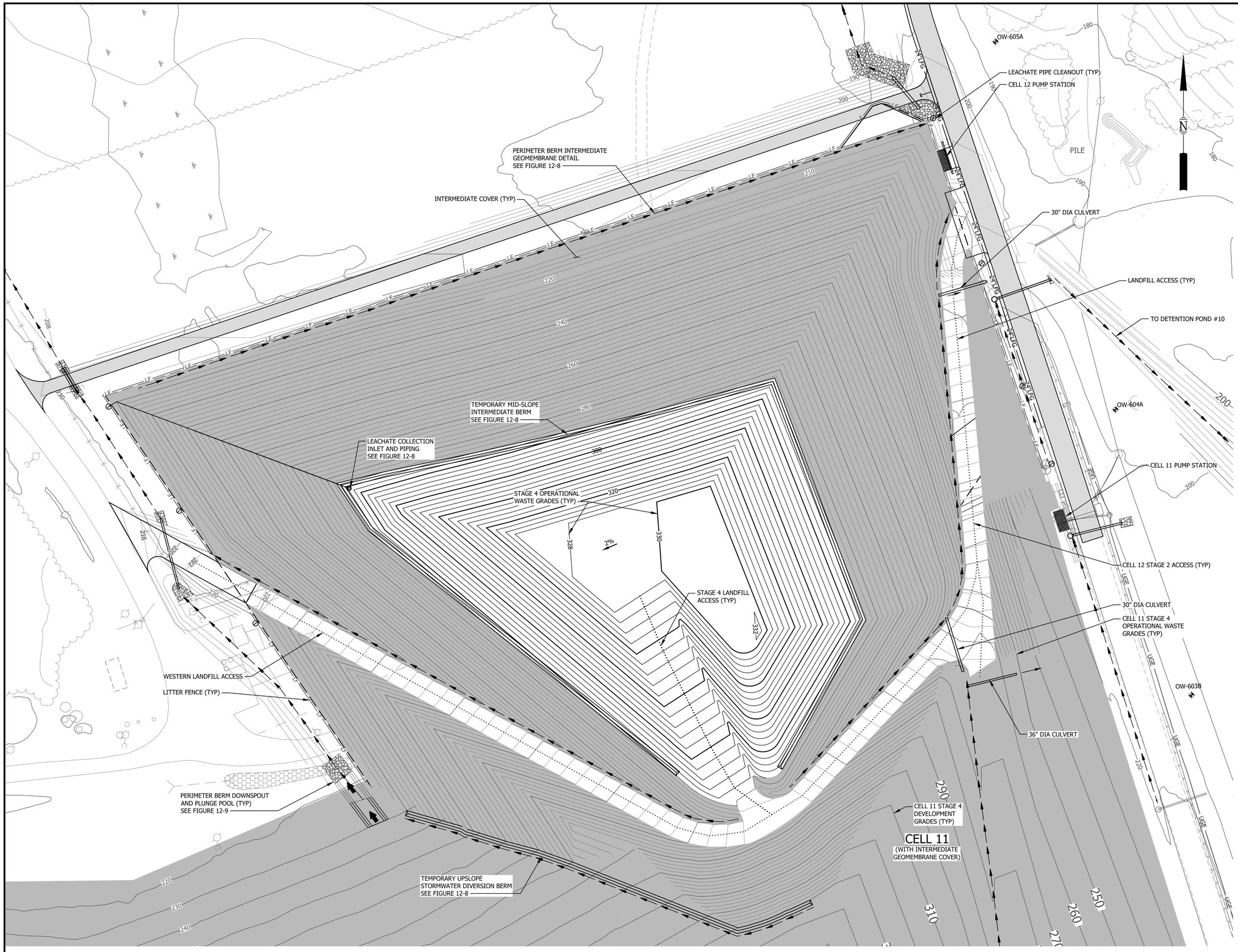

NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/24/19. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.

   STANDARD PRACTICE DICTATES THAT PLANS COMPILED IN THIS MANNER SHOULD BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

2. CONTOURS WITHIN LIMIT OF WORK AND WITHIN LANDFILL FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED NOVEMBER 15, 2019. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC (SME) OF CUMBERLAND, MAINE USING PROPELLER AEROPOINTS, DATED NOVEMBER 15, 2019:
   HORIZONTAL DATUM - NAD83 MAINE, EAST, US FT.
   VERTICAL DATUM - NAVD 88, US FT.

3. BASEGRADES WITHIN CELL 12 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.

4. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.

5. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM

ESTIMATED STAGE 4 CAPACITY
119,900 CY

FIGURE 12-5
CELL DEVELOPMENT - STAGE 4
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

SME
SEVEE & MAHER ENGINEERS
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE
4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021
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DWG: C12-STAGES(1-5) LMN: STAGE 4 CTB: SME-STD REV: 12/23/2019

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LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- LANDFILL ACCESS

NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/24/19. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.

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5. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM

ESTIMATED STAGE 5 CAPACITY
210,600 CY

40 0 80 160 FEET

FIGURE 12-6
CELL DEVELOPMENT - STAGE 5
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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SANBORN HEAD

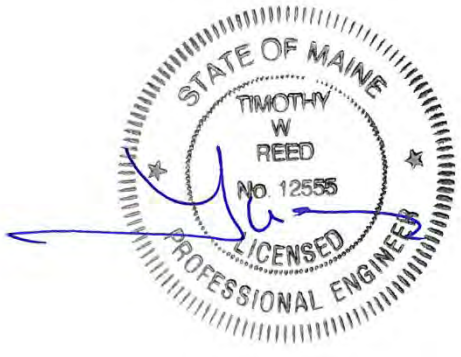
Building Trust. Engineering Success.

Technical Specifications
Cell 12 Landfill Gas System Expansion
Juniper Ridge Landfill
Old Town, Maine

Prepared for
NEWSME Landfill Operations, LLC
Old Town, Maine

Prepared by
Sanborn, Head & Associates, Inc.
20 Foundry Street
Concord, New Hampshire

File 2536.31
December 2019



CONTENTS

DIVISION 2 - SITE WORK

Section 02560 - Landfill Gas Extraction Wells
Section 02565 - Landfill Gas Trenches

SECTION 02560

LANDFILL GAS EXTRACTION WELLS

PART 1 - GENERAL

1.1 SCOPE OF APPLICATION

A. Supply all equipment, materials, and labor needed to install landfill gas extraction wells as specified herein and as indicated on the Drawings.

1.2 SUBMITTALS

A. Submit to ENGINEER Certificates of Compliance on materials furnished, and manufacturer's brochures containing complete information and instructions pertaining to the storage, handling, installation, and inspection of pipe and appurtenances furnished.

B. Submit to ENGINEER well logs within 7 days of the completion of well installations.

C. The well logs shall depict a construction diagram for each well drilled, including the total depth of the well, the temperature of spoils, depth, thickness, and description of soil or waste strata, and the occurrence of any water bearing zones.

1.3 SITE CONDITIONS

A. Obstructions and saturated conditions such as sludges, and foundry sands are sometimes encountered when drilling in landfills, many of which can be drilled through. CONTRACTOR is expected to make reasonable effort to drill through obstructions and saturated conditions and will be paid for offset redrilling and boring abandonment only with prior written approval from OWNER.

B. Well drilling shall be performed on a level surface. CONTRACTOR shall provide a level surface at each drilling location as required. The size of the level area shall be acceptable to the drilling subcontractor. Any soil placed to level the drilling location shall be removed following well installation. If soil placed for leveling contacts refuse, it shall be disposed of in the active area of the landfill.

PART 2 - PRODUCTS

2.1 BALLAST STONE

A. Ballast Stone shall be hard, durable, and resistant to weathering and to water action, free from overburden, spoil, and organic materials. Ballast Stone shall

be washed, and uniformly blended according to the particle size distribution requirements shown below.

Sieve Size	Percent Passing by Weight
2-inch	100
1½-inch	90 - 100
1-inch	30 - 40
¾-inch	10 - 15
½-inch	0 - 5
⅜-inch	0 - 5

2.2 BENTONITE SEAL

A. Bentonite Seal shall be constructed using hydrated bentonite chips or pellets.

2.3 SAND/GRAVEL FILTER

A. Sand/Gravel Filter should conform to the following particle size distribution.

Sieve Size	Percent Passing by Weight
1½-inch	100
No. 4	70 - 100
No. 40	30 - 80
No. 200	0 - 15

2.4 COMMON FILL

A. Common Fill should be soil containing no stone larger than 4 inches, and shall have a maximum of 75 percent passing the No. 40 sieve and a minimum of 35 percent passing the No. 200 sieve.

2.5 PVC PIPE

A. Refer to Specification Section 15212.

2.6 WELLHEAD

A. Wellheads should be nominal 2-inch size QED Quick Change Orifice Plate wellhead, with elastomer adapter kits, or equivalent approved by OWNER. The wellhead components are indicated on the Drawings.

B. Wellhead and flow measurement tube shall be compatible with the CES/LANDTEC GEM-2000™ and GEM-5000™ Landfill Gas Monitors.

PART 3 - EXECUTION

3.1 DRILLING

A. ENGINEER shall observe all drilling operations.

B. Wells shall be drilled to the minimum diameter and the specific depths shown on the Drawings. CONTRACTOR shall drill the wells using bucket-type augers and dry drilling equipment; wet rotary drilling equipment may not be used.

C. Well depths shown on the Drawings are estimated based on projected top of waste elevations and may be adjusted in the field by ENGINEER. At no time shall the drilling extend deeper than the bottom of well screen elevation.

D. If water is encountered in a borehole, then CONTRACTOR may be directed to drill beyond the point that it was encountered. If wet conditions remain, then drilling may be terminated and the length of perforated pipe adjusted by ENGINEER, or the well may be relocated. If wet conditions cease (e.g., due to trapped water layer), then drilling will continue to the design depth.

E. As soon as drilling is completed, a safety screen shall be placed over the top of the borehole. This screen shall stay in place until backfilling is within 4 feet of the surface. Safety screen size should be large enough to accommodate all backfill materials and any tools used during backfill yet not large enough for any human to accidentally fall through.

F. Wells shall be drilled straight and plumb and the well pipe shall be installed in the center of the borehole. CONTRACTOR will take all compression off of the pipe by mechanical means and center the pipe in the middle of the borehole before starting to backfill.

G. PVC well pipe shall be solvent cemented and mechanically fastened with stainless steel fasteners.

3.2 BACKFILLING

A. Backfilling the borehole shall commence immediately after drilling is completed and the PVC pipe has been installed. Backfill materials shall be installed as indicated on the Drawings and as approved by ENGINEER.

B. Ballast Stone shall be poured or scooped through the safety screen at a rate that will not endanger the integrity of the well casing and limits the potential for bridging.

C. The Sand/Gravel Filter shall be poured through the safety screen until a layer at least 1-foot thick above the Ballast Stone is formed.

D. The Bentonite Seal will be formed by evenly distributing bentonite around the annulus of the well until a minimum plug thickness of 1 foot has been achieved.

E. Common Fill shall be rodded in the boring to provide even distribution and compaction.

3.3 DISPOSAL

A. Refuse from well drilling operations shall be hauled to the active face of the landfill operation the same day it is excavated.

[END OF SECTION 02560]

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SECTION 02565

LANDFILL GAS TRENCHES

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. CONTRACTOR shall provide all labor, materials, equipment, and incidentals necessary to excavate and backfill trenches for the landfill gas management system as shown on the Drawings and specified herein, including, but not limited to: excavation of waste; placement of soil, aggregate, and pipe; compaction of soil; and grading.

PART 2 – PRODUCTS

2.1 GENERAL

A. All soil, unless otherwise specified, shall consist of clean soil substantially free from organic materials, wood, trash, and other objectionable materials that may be compressible or that cannot be properly compacted. Soil shall not contain stone blocks, broken concrete, masonry rubble, or other similar materials. Soil shall have physical properties such that it can be readily spread and compacted to the specified density. Snow, ice, and frozen soil shall not be permitted.

B. Unless otherwise specified, the maximum soil particle size shall be no larger than two-thirds the loose lift thickness.

2.2 MATERIALS

A. Tire Chips shall be provided by the OWNER and shall be placed in accordance with ASTM D6270.

B. HDPE pipe and fittings refer to Specification Section 15210.

PART 3 - EXECUTION

3.1 GENERAL EXCAVATION BELOW GRADE

A. CONTRACTOR shall plan and perform earthwork activities to prevent damage to existing structures, safeguard people and property, minimize disruptions to site traffic, protect the structures to be installed, and provide safe working conditions in compliance with local safety regulations and provisions of the Occupational Safety and Health Act (OSHA).

B. Excavation shall be made to the elevations and dimensions shown on the Drawings. Excavate sufficient material to provide suitable room for construction providing bracing and support as required.

3.2 EXCAVATION IN WASTE

A. CONTRACTOR shall take safety precautions during construction activities that conform to all OSHA regulations and the safety requirements of OWNER and the Specifications.

B. Trenches shall be excavated to the depths, widths, and alignments shown on the Drawings.

C. CONTRACTOR shall separate cover soil from excavated refuse to the extent possible. Cover soil may be used to backfill trenches. Excavated material not suitable for use as soil shall be transported to the working face as directed by OWNER.

D. Pockets of perched leachate may be encountered during waste excavation activities. CONTRACTOR shall immediately notify OWNER and ENGINEER when leachate is encountered. ENGINEER will provide CONTRACTOR with directions on how to manage the leachate in narrative and/or drawing form. Potential leachate management techniques may include one or a combination of the following.
   1. Backfilling the affected area.
   2. Realigning the trench.
   3. Installing a French drain.

E. To the extent possible, the trench invert shall slope uniformly as indicated on the Drawings.

F. CONTRACTOR shall not excavate more trench than can be backfilled in one day after placement of the pipe. Excavations shall not be left open overnight.

3.3 BACKFILL

A. Excavated material shall be placed in loose layers and compacted to the extent possible with the goal of establishing a firm, even surface. The loose lift thickness shall not exceed 12 inches.

B. ENGINEER does not have to be present, and does not supervise or direct the actual Work by CONTRACTOR, his/her employees, or agents. Neither the presence of ENGINEER nor any observations and testing performed by ENGINEER shall excuse CONTRACTOR from defects discovered in their Work.

[END OF SECTION 02565]

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CONTENTS

DIVISION 15 - MECHANICAL

Section 15210 – High-Density Polyethylene Pipe (HDPE), Fittings, and Appurtenances

Section 15212 - Polyvinyl Chloride (PVC) Pipe and Fittings

SECTION 15210

HIGH DENSITY POLYETHYLENE (HDPE) PIPE, FITTINGS, AND APPURTENANCES

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Furnish and install HDPE pipe and fittings for the landfill gas extraction system.

B. Pressure test HDPE pipe.

1.2 DELIVERY, STORAGE, AND HANDLING

A. The pipe and fitting manufacturer shall package products for shipment in a manner suitable for safe transport by commercial carrier. When delivered, CONTRACTOR shall inspect the shipment and report any damage to the pipe and fittings manufacturer. Pipe and fittings shall be handled, installed, and tested in accordance with manufacturer's recommendations, and the requirements of this Section.

B. Pipe Storage:
   1. Store or stack pipe to prevent damage from marring, crushing or puncture. Limit maximum stacking height to 6 feet or manufacturer's recommended maximum height, whichever is less.
   2. Store in accordance with manufacturer's recommendations.

C. Pipe Handling:

   1. Protect pipe from excessive heat or harmful chemicals.
   2. Handle pipe and use equipment needed to avoid gouging of the pipe surfaces.

PART 2 - PRODUCTS

2.1 PHYSICAL PROPERTIES:

A. Materials used for the manufacture of PE pipe and fittings shall meet the following physical property requirements:

Property	Unit	Test Procedure	Value
Material Designation	-	PPI/ASTM	-
PPI Material Listing	-	PPI TR-4	PE 4710
Cell Classification	-	ASTM D3350	445474C
Density	g/cm3	ASTM D1505	>0.941
Melt Index [E]	g/10 min	ASTM D1238	<0.15
Flexural Modulus	psi	ASTM D790	110,000 and <160,000
Tensile Strength	psi	ASTM D638	3000 to 3500
PENT	hours	ASTM F1473	>100
HDB	psi	ASTM D2837	1600 at 23^{0} C
UV Stabilizer [C]	% Carbon Black	ASTM D1603	2 to 3
Elastic Modulus	psi	ASTM D638	110,000
Brittleness Temperature	^{o}F	ASTM D746	<-180
Vicat Softening Temperature	^{o}F	ASTM D1525	255
Thermal Expansion	in/in/ ^{o}F	ASTM D696	8 x 10E-5
Hardness	Shore D	ASTM D2240	64
Molecular Weight Category	-	-	Extra High

B. There shall be no evidence of splitting, cracking, or breaking when the pipe is tested.

C. Ring Stiffness Constant (RSC) values for the pipe shall be 90 percent of the nominal.

D. The pipe and fittings shall be homogenous throughout and free from visible cracks, holes, foreign inclusions, or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density, and other physical properties.

E. Clean rework or recycled material generated by the manufacturer's own production may be used so long as the pipe or fittings produced meet all the requirements of this Section.

2.2 PIPE AND FITTINGS

A. Dimensions:
   1. Pipe Dimensions: The nominal inside diameter of the pipe shall be true to the specified pipe size in accordance with ASTM D2513. Standard laying lengths shall be 40 feet $\pm$ 2 inches.
   2. Fitting Dimensions: Fittings such as couplings, wyes, tees, adaptors, etc. for use in laying pipe shall have standard dimensions that conform to ASTM D3261.
   3. Pipe shall be SDR-17. Fitting shall be SDR-11 or SDR-17.

B. Pipe and fittings shall be produced from identical materials meeting the requirements of this Section. Special or custom fittings may be exempted from this requirement.

C. Pipe and fittings shall be pressure rated to meet the service pressure requirements specified. Fittings shall be fully pressure rated to at least the same service pressure rating as the joining pipe.

D. Molded fittings shall meet the requirements of ASTM D3261 and this Section. At the point of fusion, the outside diameter and minimum wall thickness of fitting butt fusion outlets shall meet the diameter and wall thickness specifications of the mating system pipe. Fitting markings shall include a production code that identifies the location and date of manufacture. Upon request, the manufacturer shall provide an explanation of his production code.

E. Marking:
   1. Each standard and random length of pipe and fitting shall be clearly marked with the following information:
      a. Manufacturer's Name or Trademark;
      b. ASTM Standard Designation;
      c. Nominal Pipe Size;
      d. Class & Profile Number;
      e. Production Code, including Extrusion Date, and Lot or Batch Number; and
      f. Standard Dimension Ratio.

F. The pipe and fitting manufacturer shall certify that samples of production pipe have undergone stress regression testing, evaluation, and validation in accordance with ASTM D2837 and PPI TR-3. Under these procedures, the minimum hydrostatic design basis shall be certified by the pipe and fitting manufacturer to be 1600 psi at 73.4° F and 800 psi at 140° F.

G. Material shall be listed in the name of the pipe and fitting manufacturer by the Plastics Pipe Institute (PPI) in PPI TR-4 with the following Standard Grade ratings:

		73.4° F	140° F
1.	Hydrostatic Design Basis (HDB)	1,600 psi	800 psi
2.	Hydrostatic Design Stress (HDS)	800 psi	400 psi

H. PPI material listing in the name of the resin supplier is not acceptable in meeting this requirement.

I. Certification:
   1. As the basis of the acceptance of the material, the manufacturer shall furnish a certificate of conformance of this Section upon request. When prior agreement is being made in writing between CONTRACTOR and the

manufacturer, the manufacturer shall furnish other conformance certification in the form of affidavit of conformance, test results, or copies of test reports.

2.3 GASKETS AND HARDWARE

A. All gaskets shall be Viton or other similar materials approved by OWNER. Joint hardware shall be Type 304 stainless steel.

2.4 FITTINGS

A. Fittings shall be manufactured from polyethylene compound having cell classification equal to or exceeding compound used in pipe to ensure compatibility of polyethylene resins.

B. Dimensions of fittings conforming to standard dimensions and tolerances in accordance with ASTMD 3261.

C. Fittings shall have the same or higher pressure rating as pipe.

D. Markings:
1. Manufacturer's name or trademark.
2. Nominal size.
3. Type of plastic pipe (i.e., PE 4710).
4. Standard dimension ratio.
5. Extrusion date, lot number or batch number.

E. The Drawings do not show all fittings that may be required. Provide all fittings required for a complete installation.

PART 3 – EXECUTION

3.1 FIELD QUALITY CONTROL

A. Pipe may be rejected for failure to conform to any of the following:
1. Fractures or cracks passing through pipe wall, except single crack not exceeding 2 inches in length at either end of pipe, which may be cut off and discarded. All pipes within one shipment shall be rejected if defects exist in more than five percent of shipment or delivery.
2. Cracks sufficient to impair strength, durability, or service ability of pipe.
3. Defects indicating improper proportioning, mixing, and molding.
4. Damaged ends, where such damage prevents making satisfactory joint.
5. Damage due to handling or installation. Scratches and gouges exceeding five percent of the wall thickness shall be considered excessive, and may be rejected by ENGINEER or OWNER.

B. Acceptance of fittings, stubs, or other specially fabricated pipe sections shall be based on visual inspection by ENGINEER and documentation of conformance to this Section.

C. Prior to backfilling trench CONTRACTOR shall obtain as-built top of pipe coordinates and elevations at grade changes, terminations, fittings, and at least every 50 feet along the pipe.

3.2 INSTALLATION

A. Trench, backfill, and compact in accordance with Specification Section 02565.

B. Heat Fusion of Pipe:

1. Weld pipe in accordance with manufacturer's recommendation for butt fusion methods. The pipe manufacturer shall certify fusion machine operators.
2. Butt fusion equipment for joining procedures shall be capable of meeting conditions recommended by pipe manufacturer including, but not limited to, temperature, alignment, and fusion pressures.
3. Branch saddle fusions shall be joined in accordance with manufacturer's recommendations and procedures. Branch saddle fusion equipment shall be of a size to facilitate saddle fusion within the trench.
4. For cleaning pipe ends, solutions such as detergents and solvents, when required, shall be used in accordance with manufacturer's recommendations. Solvents shall not be used unless approved by OWNER.
5. Do not bend pipe to greater degree than minimum radius recommended by manufacturer for type and grade.
6. Do not subject pipe to strains that will overstress or buckle pipe or impose excessive stress on joints.
7. Before butt fusing pipe, observe inside of each pipe length for presence of dirt, sand, mud, shavings, and other debris or animals. Remove debris from pipe prior to fusing.
8. Cap open ends of fused pipe at end of each working day to prevent entry by animals, debris, or stormwater.
9. Use compatible fusion techniques when polyethylenes of different melt indexes are fused together. Refer to manufacturer's specifications for compatible fusion.

C. Flange Jointing:
1. Use on flanged pipe connection sections.
2. At a minimum convoluted stainless steel backup rings shall be used for joining HDPE pipes below grade, and epoxy-coated carbon steel backup flanges shall be used above grade, unless stainless steel is specified by OWNER.
3. Butt fuse fabricated flange adapters to pipe or use electrofusion couplings.
4. Observe the following precautions in connection of flange joints:

a. Use full-face gaskets only.
b. All fasteners and back-up rings shall be Type 18-8 or Type 304 stainless steel below grade, and zinc-plated steel above grade.
c. Align flanges or flange/valve connections to provide tight seal.
d. U.S. Standard round washers may be used on some flanges when in accordance with manufacturer's recommendations. Bolts shall be lubricated prior to installation.

5. Protect below grade bolts and flanges by covering with a 6-mil thick PE wrap. Duct tape wrap to HDPE pipe.
6. Electrofusion couplers, where used, shall be installed per manufacturer's specifications. The outside diameter of the HDPE pipe and face shall be prepared in accordance with manufacturer's recommendations prior to installing the coupler.

D. Pipe Placement:
1. Grade control equipment shall be of the type to accurately maintain design grades and slopes during installation of pipe.
2. Unless otherwise specifically stated, install pipe in accordance with manufacturer's recommendations.
3. Maximum lengths of fused pipe to be handled as one section shall not exceed 400 feet and shall be placed according to the manufacturer's recommendations as to pipe size, pipe SDR, and topography so as not to cause excessive gouging or surface abrasion. Pipe wall gouges deeper than 3/16-inch may be cause for rejection of the pipe.
4. Cap pipe sections longer than single joint (usually 40 feet) on both ends during placement except during fusing operations.
5. Remove dirt or debris from inside of pipe before backfilling.
6. Notify ENGINEER prior to installing pipe into trench and allow time for observation. CONTRACTOR shall correct irregularities identified during observation.
7. Complete connections within trench whenever possible to prevent overstressed connections.
8. Allow pipe sufficient time to adjust to trench temperature prior to testing, fusion welding, making segment connections, or backfilling activity.
9. To reduce branch saddle stress, install saddles at slope equal to and continuous with connecting pipe.
10. Install reducers adjacent to laterals and tees unless directed otherwise.
11. Place pipe system in trench allowing at least 12 in./100 ft. for thermal contraction and expansion.

3.2 PIPE TESTING

A. CONTRACTOR shall perform a pneumatic test of the non-perforated pipe and fittings, with the exception of the 50-feet of solid pipe installed in the horizontal collection trenches, after placement in the trench, in accordance with manufacturer's recommendations.

B. Pipes shall be pressure tested in presence of ENGINEER. Provide adequate notice to ENGINEER before performing test.

C. Pneumatic testing shall be performed as follows:
   1. The test period at the test pressure shall last no more than 10 minutes.
   2. Provide all necessary connections, bulkheads, flanges, bracing, and blocking, as well as all required test equipment.
   3. Test pressure gauge shall have a recommended range of 20 psig, with minor gradations no greater than 0.1 psig.
   4. Pipe to be tested shall be exposed in the trench, except bends, reduced pressure rated fittings and components, which shall be buried or restrained. Flange connections shall be visible to check for leaks.
   5. Test pressure shall be 10 psig.
   6. Acceptance
      a. Test shall be accepted if the pressure drop over 10 minutes is less than 5 percent of the pressure at the beginning of the test period.

D. Test Report
   1. ENGINEER shall prepare and submit to OWNER a test report using the attached forms for each pipe system tested. Include following information in test report.
      a. Date of test.
      b. Description and identification of pipe system tested.
      c. Type of test performed.
      d. Test fluid.
      e. Test pressure.
      f. Results of test.
      g. Type and location of leaks detected.
      h. Corrective action taken to repair leaks.
      i. Results of retesting.
      j. Name of person performing test.

[END OF SECTION 15210]

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ATTACHMENT 1 TO SECTION 15210
PIPE PRESSURE AIR TEST LOG

SANBORN HEAD		Project No.:	
		Project Name:	
		Project Location:	
		Weather:	
Contractor:		Test No.:	
CQA Personnel:		Person/Company Performing the Test:	
Date of Test:		Time of Test:	Finish:
Pipe Length: ~ ft.	Pipe Diameter: in.	Pipe Material:	Pipe SDR/Sch.:
Rated Working Pressure:		Test Pressure: psi	
Location/designation of pipe tested:			

t Time (min.)	T Pipe Temperature (ºC)	P_t Pressure Gauge Reading (psig)	P_c Pressure Drop (%)
0			
5			
10			
15			
30			
60			

Pass	Fail	Retest? Yes	No

Description of leaks and repairs of retested pipe segments:

P_c = Percent Pressure Drop $\frac{P_o - P_t}{P_o} \times 100$

P_o = Initial Pressure Gauge Reading

P_t = Pressure Gauge Reading at Time t

Comments:

Signature:

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SECTION 15212

POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Supply polyvinyl chloride (PVC) Schedule 80 pipe and fittings as shown on the Drawings.

1.2 SUBMITTALS

A. Submit to ENGINEER manufacturer's technical product data and installation instructions for PVC pipe and fittings.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Pipe and fittings shall be manufactured from a PVC compound which meets the requirements of Cell Classification 12454-B PVC as outlined in ASTM D1784.

B. PVC pipe used in the construction of landfill gas extraction system shall meet the requirements of ASTM D1784 and ASTM D1785 for Schedule 80 PVC pipe.

C. PVC fittings used in the construction of landfill gas extraction system shall meet the requirements of ASTM D2464 and ASTM D2467.

D. All PVC cements shall meet the requirements of ASTM D2564 for solvent cemented PVC joints.

E. Clean rework or recycle material generated by the manufacturer's own production may be used so long as the pipe or fittings produced meet all the requirements of this Section.

F. Fittings shall be industrial, heavy duty, hub style.

G. Socket fittings shall be pressure rated the same as the corresponding size pipe prescribed by ASTM D1785. Threaded fittings shall be pressure rated to at least 50 percent of the rating for socket fittings.

2.2 FLANGES

A. Flanges shall be one piece solid design or two-part Van Stone type that use the tapered, serrated face and full face gasket technique for joining and are compatible with ANSI B16.5 Class 150 metal flanges.

B. Flanges shall be pressure rated at 150 psi for water service at 73°F, non-shock and have a minimum burst requirement of 3.3 times the rated pressure.

C. Bolts shall be zinc-plated ASTM A193, Grade B8M hex head, and nuts shall be zinc-plated ASTM A194, Grade 8M hex head.

D. Gaskets shall be ⅛-inch thick, full face Viton or other similar materials approved by OWNER.

PART 3 - EXECUTION

3.1 PVC PIPE HANDLING

A. PVC pipe and pipe fittings shall be handled carefully in loading and unloading. They shall be lifted by hoists and lowered on skidways in such a manner as to avoid shock. Derricks, ropes, or other suitable equipment shall be used for lowering the pipe into well borings. Pipe and pipe fittings shall not be dropped or dumped.

3.2 PVC PIPE INSTALLATION

A. PVC pipe installation shall conform to the requirements of this Section, the manufacturer's recommendations, and as outlined in ASTM D2774V.

3.3 JOINING OF PVC PIPES

A. Pipes shall be joined in accordance with ASTM D2855.

B. Pipe shall be inspected for cuts, scratches, or other damages prior to installation. Pipe with imperfections shall not be used.

C. Burrs, chips, etc., shall be removed from pipe interior and exterior.

D. Loose dirt and moisture shall be wiped from the interior and exterior of the pipe end and the interior of the fitting.

E. Pipe cuts shall be square and perpendicular to the center line of pipe.

F. A coating of CPS primer, as recommended by pipe supplier, shall be applied to the entire interior surface of the fitting socket, and to an equivalent area on the exterior of the pipe prior to applying solvent cement.

G. The solvent cement shall comply with the requirements of ASTM D2564 and shall be applied in strict accordance with manufacturer's specifications.

H. Pipe and pipe fittings shall be selected so that there will be as small a deviation as possible at the joints, and so that inverts present a smooth surface. Pipe and fittings that do not fit together to form a tight fitting shall be rejected.

[END OF SECTION 15212]

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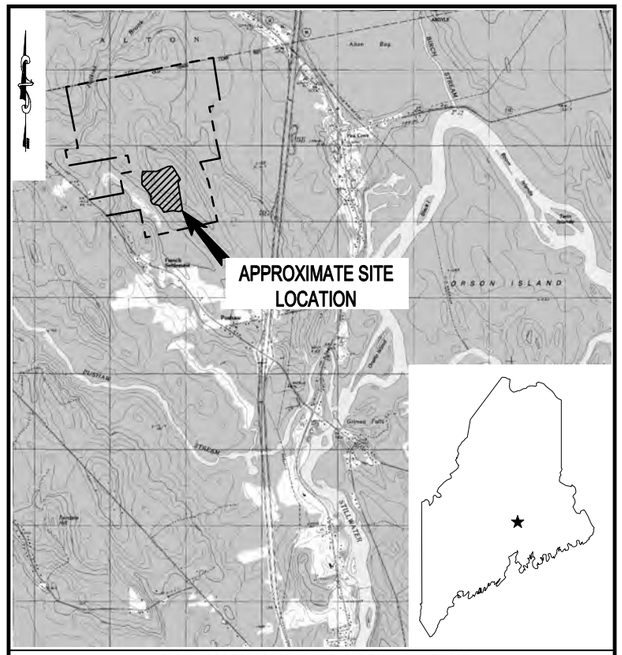
CELL 12 LANDFILL GAS SYSTEM EXPANSION DRAWINGS

JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE
DECEMBER 2019



FROM: USGS TOPOGRAPHIC MAP- OLD TOWN, MAINE (1988)

LOCUS PLAN

SCALE: 1"=1000'

SHEET INDEX

SHEET 1	OVERALL SITE PLAN
SHEET 2	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 1
SHEET 3	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 2
SHEET 4	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 3
SHEET 5	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 4
SHEET 6	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 5
SHEET 7	CROSS-SECTION
SHEET 8	12"Ø HEADER INSTALLATION PLAN
SHEETS 9-12	DETAILS

PREPARED FOR:

NEWSME LANDFILL OPERATIONS, LLC

JUNIPER RIDGE LANDFILL

OLD TOWN, MAINE

PREPARED BY:

SANBORN HEAD

20 FOUNDRY STREET, CONCORD, NEW HAMPSHIRE 03301
(603) 229-1900 FAX (603) 229-1919

PROJ.#: 2536.31 "CELL 12 LANDFILL GAS SYSTEM EXPANSION DRAWINGS, JUNIPER RIDGE LANDFILL, OLD TOWN, MAINE" DECEMBER 2019.

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PLOT DATE: 12-19-19

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NOTES:

1. BASE MAP WAS PREPARED BY AERIAL SURVEY & PHOTO INC. OF NORRIDGEWOCK, MAINE. PHOTO DATE 6/24/19. VERTICAL DATUM: BRASS PLUG AT PUMP STATION. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83.

LEGEND:

- 190 — 10-FOOT CONTOUR
- 2-FOOT CONTOUR
- LIMIT OF WASTE CONTAINMENT
- CELL LIMIT

CELL 1
CELL 2
CELL 3A
CELL 3B
CELL 4
CELL 5
CELL 6
CELL 7
CELL 8
CELL 9
CELL 10
CELL 11
PROPOSED CELL 12

SANBORN HEAD

GRAPHICAL SCALE
120' 60' 0' 120' 240'

STATE OF MAINE TIMOTHY W REED 12988 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

OVERALL SITE PLAN

SHEET NUMBER: 1 OF 12

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NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 12 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON NOVEMBER 13, 2019.
3. GRADES SHOWN WITHIN THE EXISTING LANDFILL FOOTPRINT REPRESENT ANTICIPATED GRADES DURING CELL 12 FILLING. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
4. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
5. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
6. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
7. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	
CT GCT-710	COLLECTION TRENCH WELLHEAD	GCT-1201
	COLLECTION TRENCH TERMINATION	CT
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

EAST BERM ACCESS ROAD
24"ø
12"Ø ISOLATION VALVE
CONNECT 8"Ø HDPE DRAIN TO PRIMARY LEACHATE COLLECTION SYSTEM CLEANOUT
COLLECTION TRENCH WELLHEAD
GCT-1201
GCT-1202
GCT-1203
GCT-1204
50 FT MIN.
12" STUB ROTATED UP SLOPE
2% MIN
100 FT (TYP)
LFG COLLECTION TRENCH TERMINATION (TYP)
EXTENT OF STAGE 1 WASTE PLACEMENT
8"ø DRAIN
4" DRAIN
GW-101
GW-102
GW-103
GW-104
GW-105
GW-106
GW-07
GW-14
GW-15
GW-16
GW-16R
GW-24
GW-24R
GW-25
GW-25R
GW-06
GW-13
GW-22R
GW-33R
GW-5
GW-B
GW-C
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GCT-3B1
GCT-3B4

SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE TIMOTHY W REED No. 12655 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ / R. CLAY
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 1

SHEET NUMBER: 2 OF 12

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NOTES:

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3. GRADES SHOWN WITHIN THE EXISTING LANDFILL FOOTPRINT REPRESENT ANTICIPATED GRADES DURING CELL 12 FILLING. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
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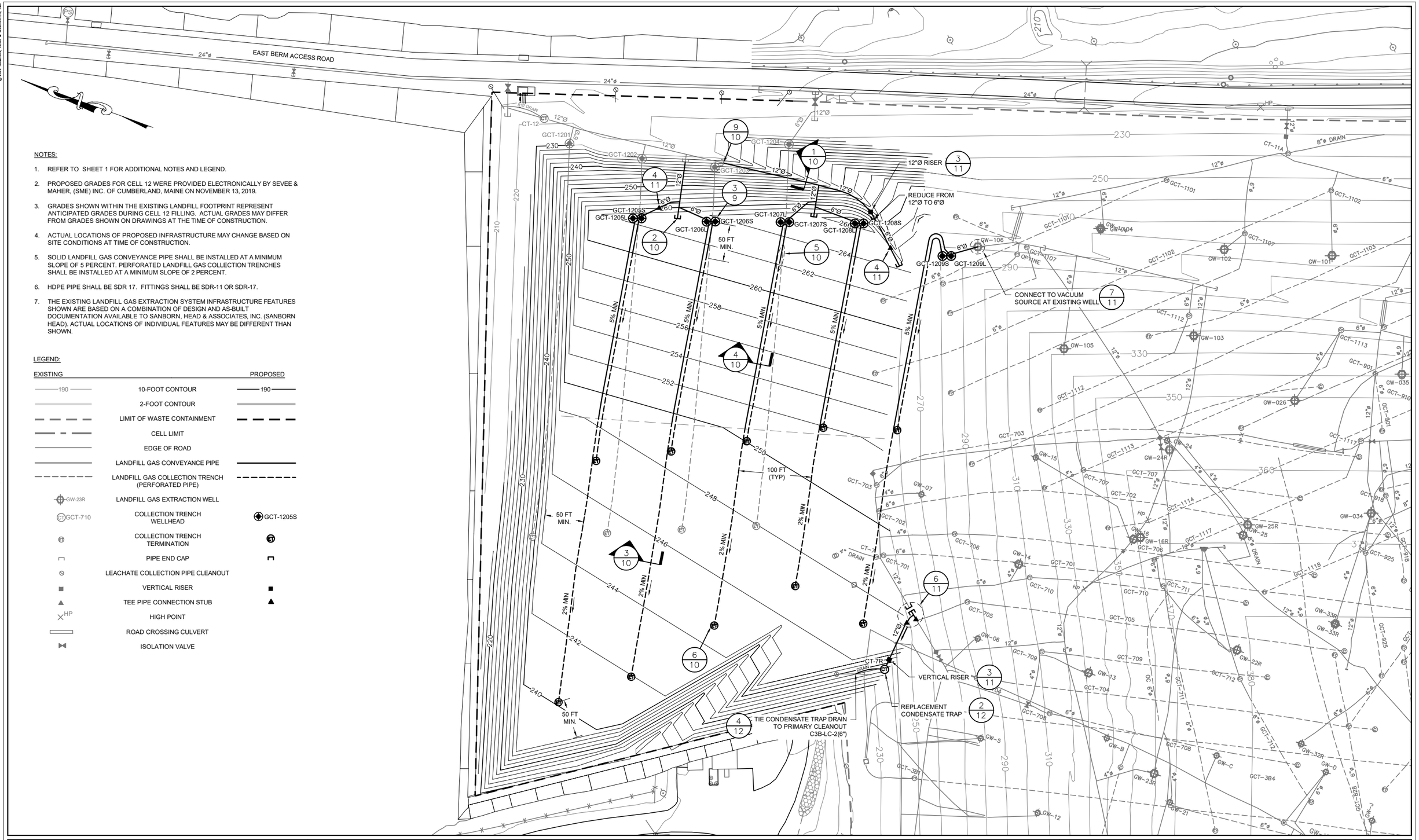
LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	
CT GCT-710	COLLECTION TRENCH WELLHEAD	GCT-1205S
CT	COLLECTION TRENCH TERMINATION	CT
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	



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SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE TIMOTHY W REED No. 12655 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ / R. CLAY
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 2

SHEET NUMBER: 3 OF 12

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NOTES:

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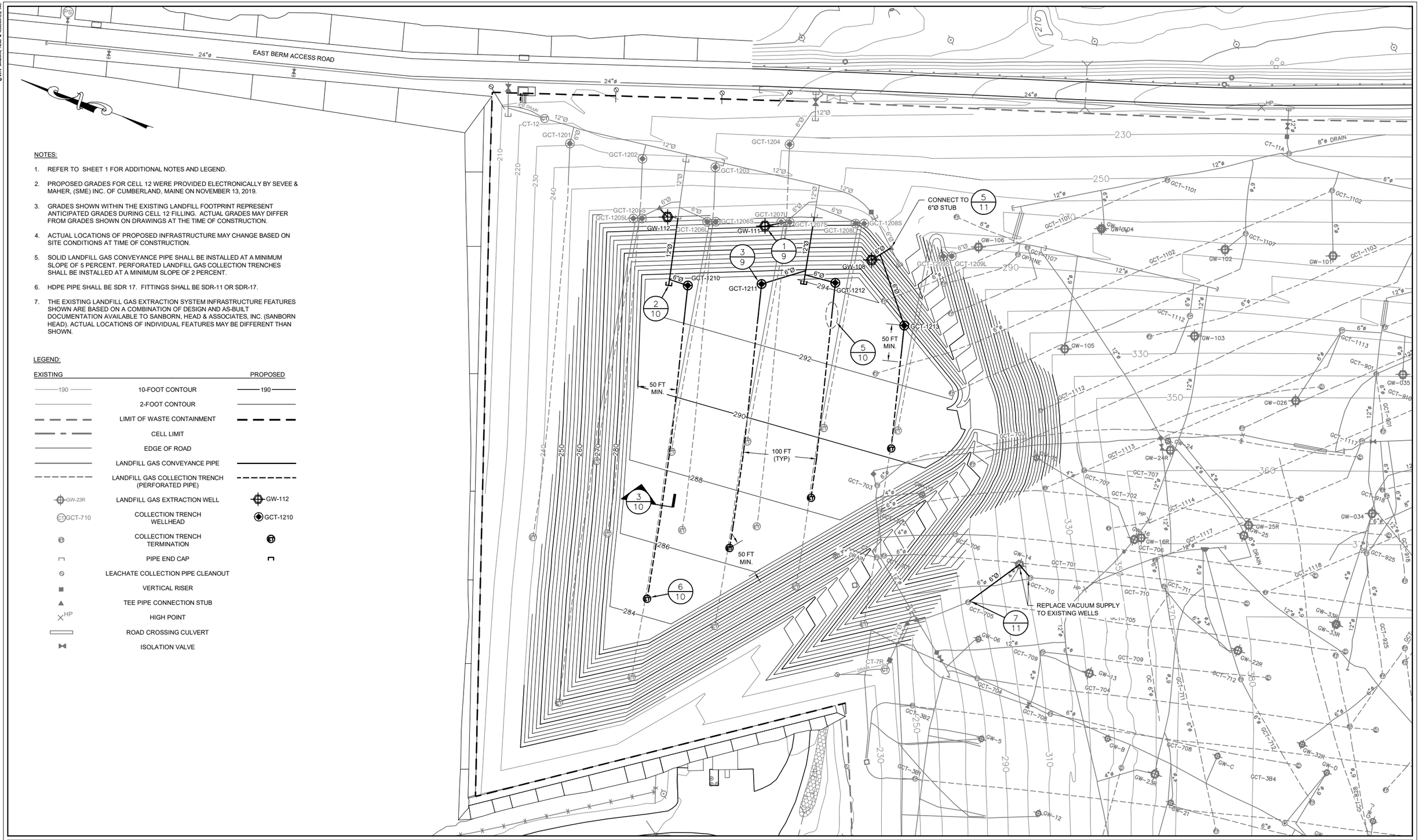
LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-112
CT GCT-710	COLLECTION TRENCH WELLHEAD	GCT-1210
CT	COLLECTION TRENCH TERMINATION	CT
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	



SANBORN HEAD	GRAPHICAL SCALE 60' 30' 0' 60' 120'	STATE OF MAINE TIMOTHY W REED No. 12655 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ / R. CLAY
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 3

SHEET NUMBER: 4 OF 12

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3. GRADES SHOWN WITHIN THE EXISTING LANDFILL FOOTPRINT REPRESENT ANTICIPATED GRADES DURING CELL 12 FILLING. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
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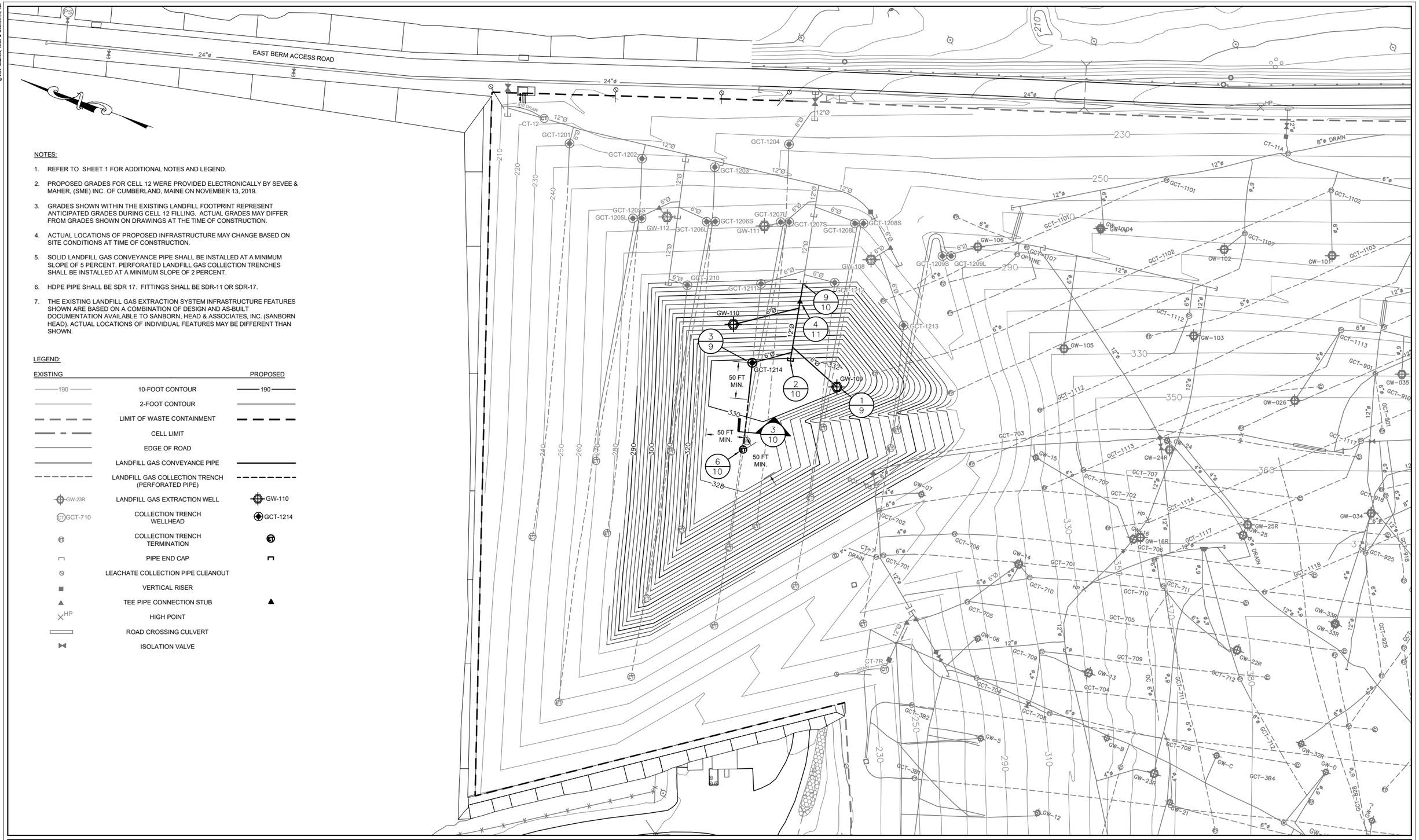
LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-110
CT GCT-710	COLLECTION TRENCH WELLHEAD	GCT-1214
	COLLECTION TRENCH TERMINATION	CT
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	



SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE
TIMOTHY W REED
No. 12655
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ / R. CLAY
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 4

SHEET NUMBER: 5 OF 12

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NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 12 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON NOVEMBER 13, 2019.
3. GRADES SHOWN WITHIN THE EXISTING LANDFILL FOOTPRINT REPRESENT ANTICIPATED GRADES DURING CELL 12 FILLING. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
4. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
5. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
6. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
7. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-120
GCT-710	COLLECTION TRENCH WELLHEAD	
	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

VERTICAL LFG EXTRACTION WELL (TYP) 1/9

SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE TIMOTHY W REED No. 12655 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ / R. CLAY
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 5

SHEET NUMBER: 6 OF 12

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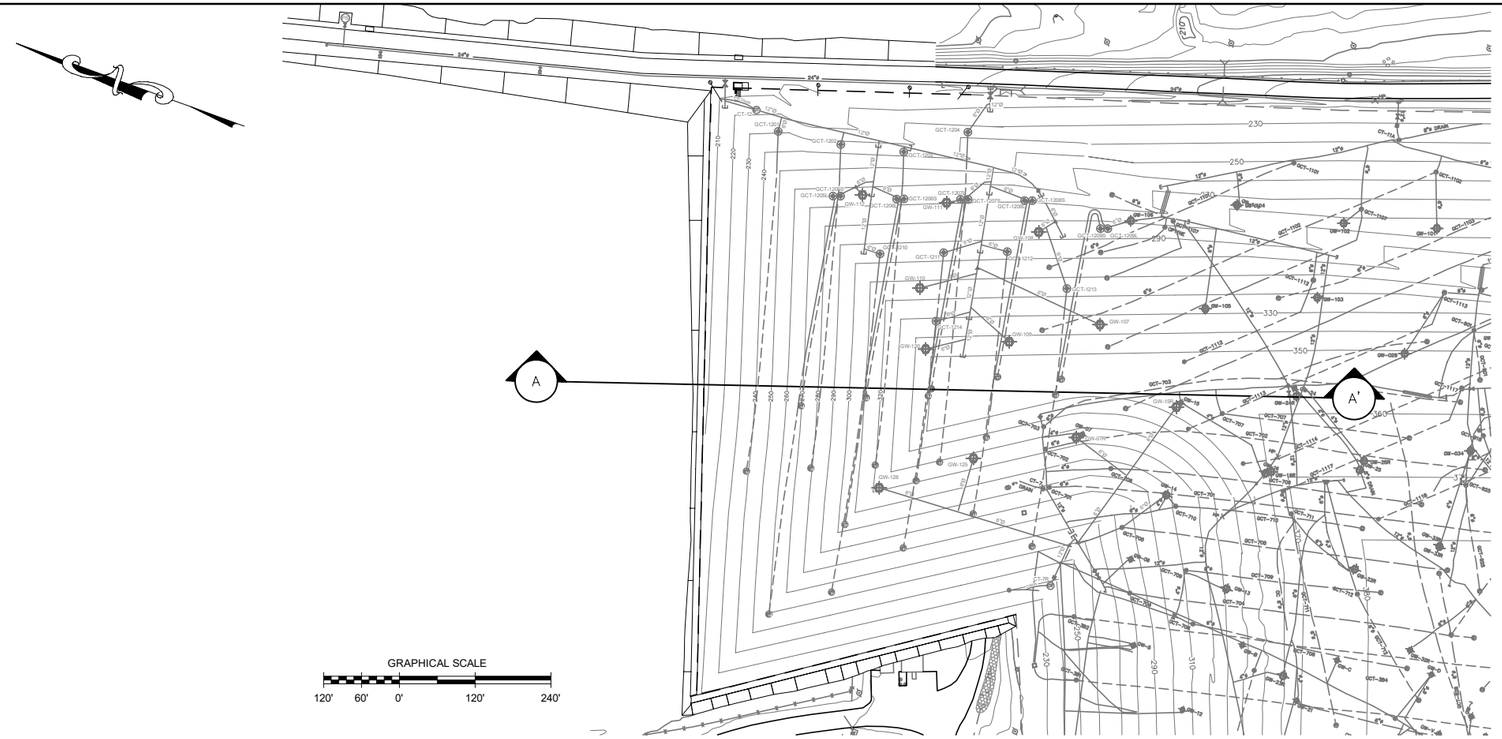
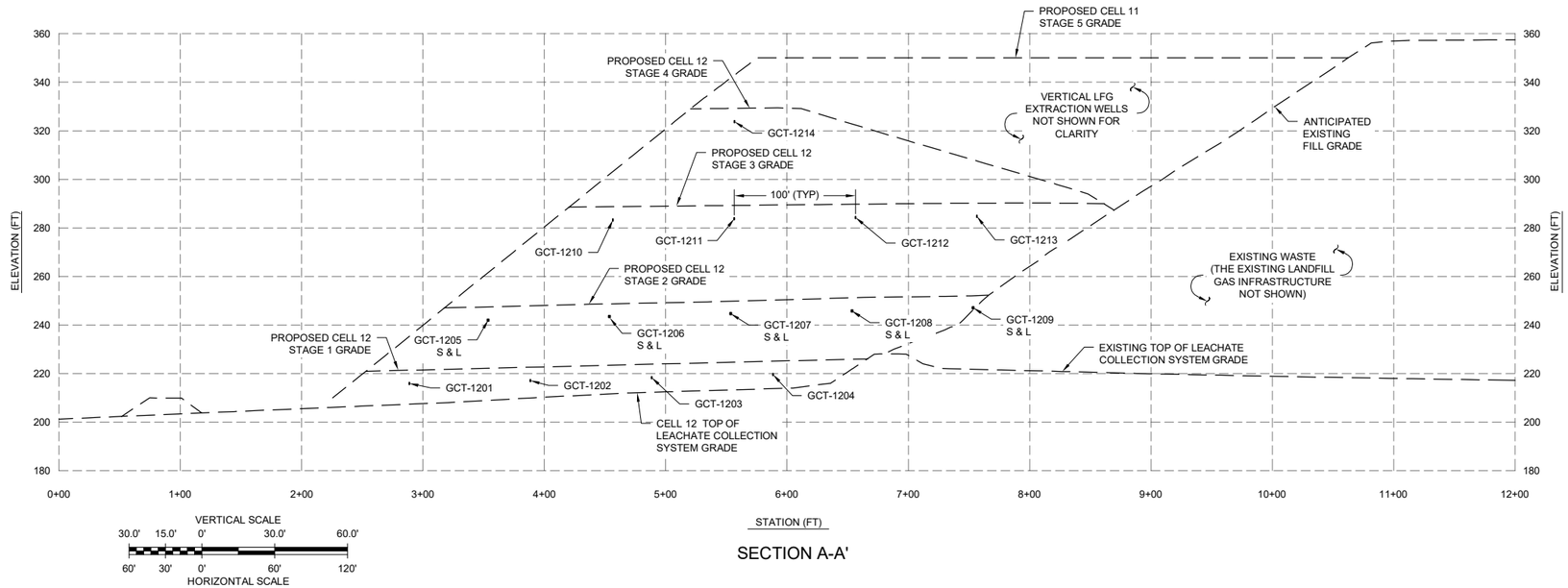


REFERENCE PLAN

NOTES:

1. THE CROSS SECTION SHOWN ON THIS SHEET ILLUSTRATES THE PROPOSED LAYOUT AND SPACING OF GAS COLLECTION TRENCHES IN CELL 12. ACTUAL GRADES MAY DIFFER FROM THE GRADES SHOWN AT THE TIME OF CONSTRUCTION. VERTICAL WELLS ARE NOT SHOWN ON THE CROSS SECTION FOR CLARITY.
2. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.



SECTION A-A'

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE TIMOTHY W REED No. 12655 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ / R. CLAY
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

CROSS-SECTION

SHEET NUMBER: 7 OF 12

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NOTES:

1. SEE SHEET 1 FOR ADDITIONAL NOTES AND LEGEND
2. PIPE LENGTHS PROVIDED ARE 2D PIPE LENGTHS AND DO NOT ACCOUNT FOR SLOPE.

24"ø

12"Ø TEE

CT-12

23'

52'

12"Ø

41'

101'

TEE CONDITION - 1
6"Ø PIPE TO GCT-1201

58'

12"Ø

TEE CONDITION - 1
6"Ø PIPE TO GCT-1202

42'

10'

12"Ø TEE
ROTATED UP SLOPE

10'

134'

12"Ø

31'

51'

12"Ø

12"Ø RISER

10'

REDUCE TO 6"Ø AND
ADD TEMPORARY
END CAP

VALVE

13'

12"Ø

13'

TEE CONDITION - 1
6"Ø PIPE TO GCT-1204

TEE CONDITION - 2
6"Ø PIPE TO GCT-1203

12"Ø TEE
ROTATED UP SLOPE

22'

TEE CONDITION - 1
6"Ø PIPE TO GCT-1205 S AND L

55'

12"Ø

8'

TEE CONDITION - 1
6"Ø PIPE TO GCT-1207 S AND L

14'

TEE CONDITION - 1
6"Ø PIPE TO GCT-1206 S AND L

15'

TEMPORARY END CAP
(TYP)

TEE CONDITION - 1
6"Ø PIPE TO GCT-1208 S AND L

12"Ø

74'

84'

12"Ø

TEE CONDITION - 1
6"Ø PIPE TO GCT-1210

8'

TEE CONDITION - 1
6"Ø PIPE TO GCT-1211

6'

TEE CONDITION - 1
6"Ø PIPE TO GCT-1212

13'

TEE CONDITION - 1
6"Ø PIPE TO GW-107

24'

10'

TEE CONDITION - 1
6"Ø PIPE TO GW-110

12"Ø

54'

TEE CONDITION - 1
6"Ø PIPE TO GW-109

7'

TEE CONDITION - 1
6"Ø PIPE TO GCT-1214

12'

12"Ø

32'

TEE CONDITION - 1
6"Ø PIPE TO GW-120

29'

STAGE 1
LENGTH OF 12"Ø PIPE = 354 FT
(SEE NOTE 2)

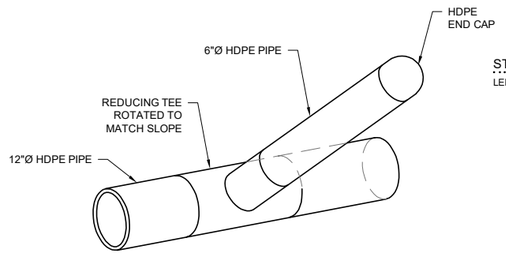
STAGE 2
LENGTH OF 12"Ø PIPE = 348 FT

STAGE 3
LENGTH OF 12"Ø PIPE = 185 FT

STAGE 4
LENGTH OF 12"Ø PIPE = 107 FT

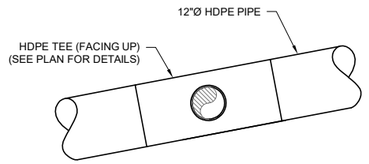
STAGE 5
LENGTH OF 12"Ø PIPE = 61 FT

210 220 230 240 340 350 360 370 380 390 500 510 520



ISOMETRIC VIEW

TEE CONDITION - 1



PLAN VIEW

TEE CONDITION - 2

SANBORN HEAD

GRAPHICAL SCALE
30' 15' 0' 30' 60'

STATE OF MAINE
TIMOTHY
W
REED
No. 12655
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ / R. CLAY
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

12"Ø HEADER INSTALLATION PLAN

SHEET NUMBER: 8 OF 12

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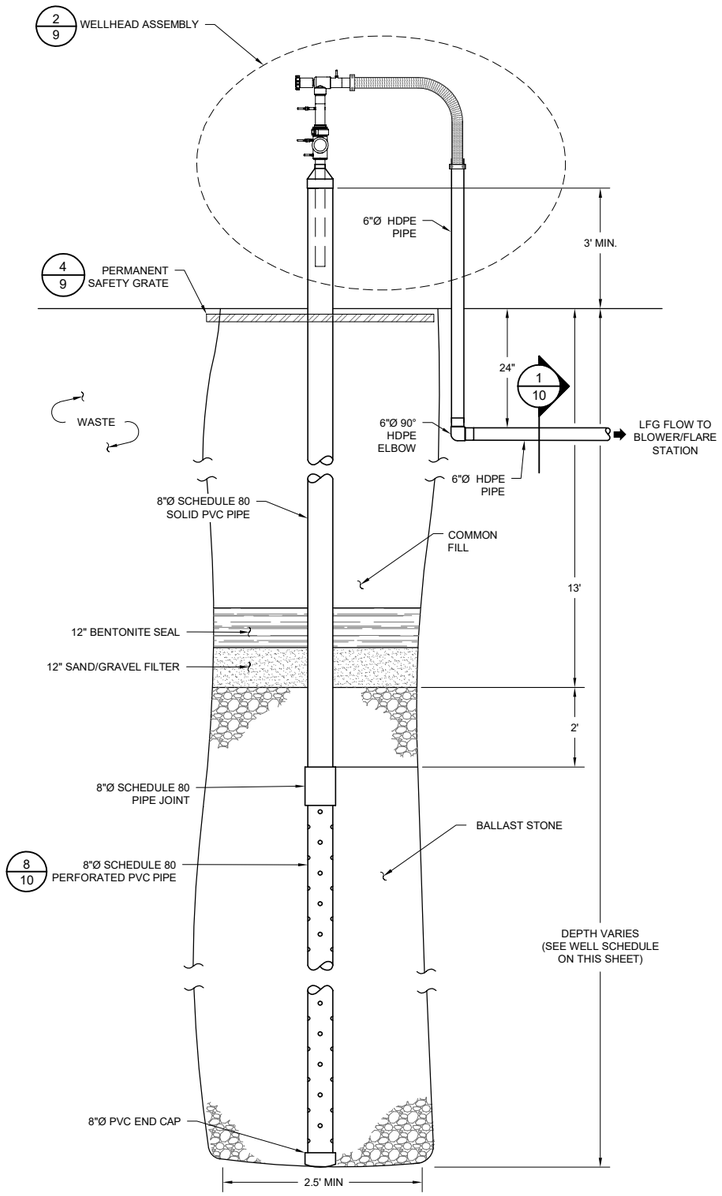


LFG EXTRACTION WELL DETAIL

1

NOT TO SCALE

NOTES:

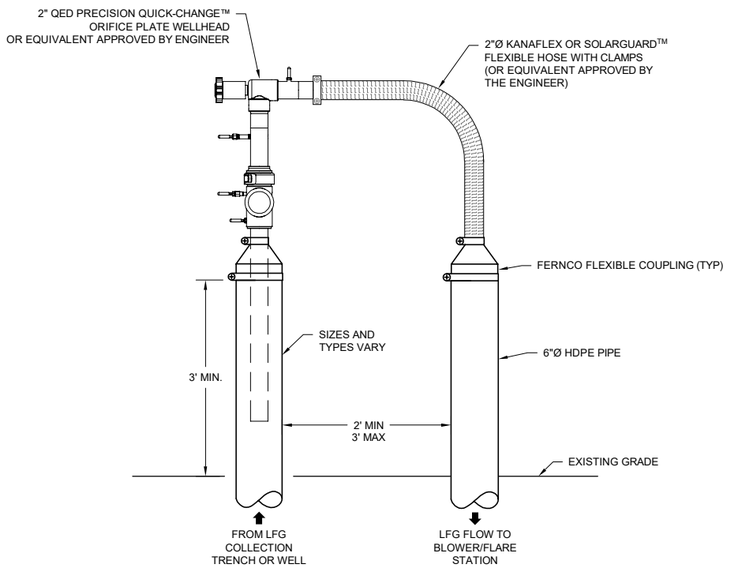
1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.

WELL SCHEDULE NOTES:

1. LFG EXTRACTION WELLS SHALL BE INSTALLED WITHIN ONE FOOT OF LISTED LOCATIONS AND TO THE NEAREST FOOT IN DEPTH.
2. A TEMPORARY BENCHMARK WITH ELEVATION SHALL BE ESTABLISHED AT EACH WELL PRIOR TO DRILLING.
3. 15 FEET OF SOLID RISER IS TO BE PROVIDED BELOW INTERMEDIATE COVER GRADES. THE INTENT IS TO PROVIDE 3 FEET OF STICK UP ABOVE FILL GRADES.
4. ELEVATIONS SHALL BE CONFIRMED AGAINST AS-BUILT TOP OF PRIMARY SAND GRADES AND FILL GRADES PRIOR TO CONSTRUCTION.

WELL SCHEDULE

WELL DESIGNATION	NORTHING	EASTING	BOTTOM OF WASTE (FT)	TOP OF EXISTING WASTE (FT)	TOTAL WELL DEPTH (FT)	BOTTOM OF WELL SCREEN (FT)	TOP OF WELL SCREEN (FT)	SCREEN LENGTH (FT)	TOP OF CASING ELEV. (FT)
GW-07R	479365.5	926522.9	220.1	324.8	89.7	235.1	309.8	74.7	327.8
GW-107	479391.3	926703.4	221.5	335.1	98.6	236.5	320.1	83.6	338.1
GW-108	479532.6	926808.3	211.0	280.1	54.1	226.0	265.1	39.1	283.1
GW-109	479517.1	926628.7	221.8	330.3	93.5	236.8	315.3	78.5	333.3
GW-110	479679.4	926660.7	209.0	313.8	89.8	224.0	298.8	74.8	316.8
GW-111	479685.6	926802.0	206.1	269.6	48.4	221.1	254.6	33.4	272.6
GW-112	479814.8	926768.1	203.2	264.1	45.9	218.2	249.1	30.9	267.1
GW-120	479637.5	926572.9	212.4	345.8	118.4	227.4	330.8	103.4	348.8
GW-125	479507.4	926436.3	217.6	326.6	94.1	232.6	311.6	79.1	329.6
GW-128	479631.8	926341.3	215.2	321.8	91.6	230.2	306.8	76.6	324.8
GW-15R	479232.9	926622.3	219.0	350.0	116.0	234.0	335.0	101.0	353.0



WELLHEAD NOTES:

A. WELLHEAD SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL. INSTRUCTIONS SHALL BE THOROUGHLY READ BEFORE ATTEMPTING ASSEMBLY AND INSTALLATION OF WELLHEAD.

B. WELLHEAD AND FLOW MEASUREMENT TUBE ASSEMBLY SHALL BE COMPATIBLE WITH LANDTEC GEM-2000 AND GEM-5000 LANDFILL GAS MONITORS.

C. FOR FLEXIBLE CONNECTIONS TO PIPE, USE "IPS WELD-ON 795" PLASTIC PIPE CEMENT OR EQUIVALENT APPROVED BY ENGINEER.

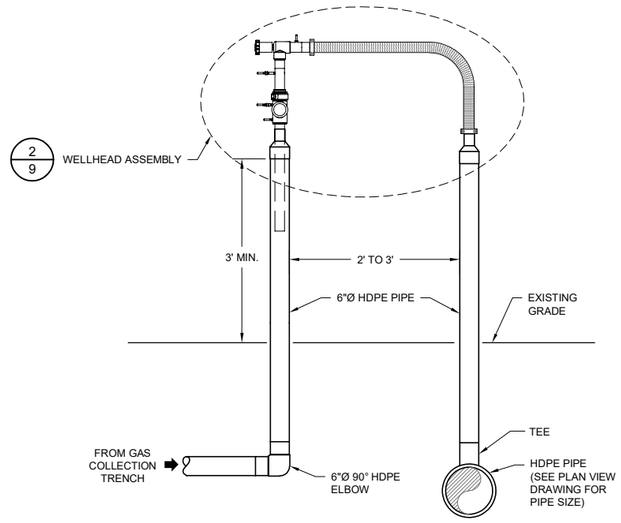
D. WARNING: DO NOT CUT THE FLOW MEASUREMENT TUBE ASSEMBLY. FAILURE TO HEED THIS WARNING WILL RESULT IN A DAMAGED OR INOPERATIVE WELLHEAD AND VOID THE WARRANTY. SUCH DAMAGE WOULD REQUIRE REPLACEMENT OF THE WELLHEAD.

E. ALLOW SUFFICIENT SLACK IN FLEX HOSE FOR PIPE EXPANSION AND CONTRACTION; AN EXTRA 8 TO 12 INCHES IS RECOMMENDED.

WELLHEAD ASSEMBLY

2

NOT TO SCALE



COLLECTION TRENCH WELLHEAD

3

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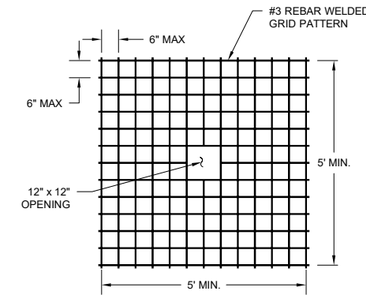

NOTES:

1. PERMANENT SAFETY GRATE TO BE BURIED IN COMMON FILL AT EACH WELL LOCATION.

PERMANENT SAFETY GRATE

4

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE TIMOTHY W REED No. 12655 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R.CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

DETAILS

SHEET NUMBER: 9 OF 12

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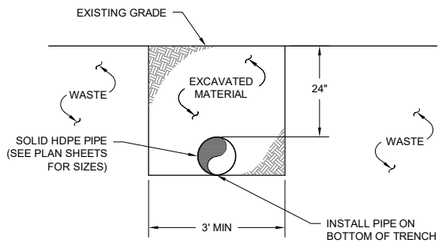
NOTES:

1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.



SOLID PIPE TRENCH

1

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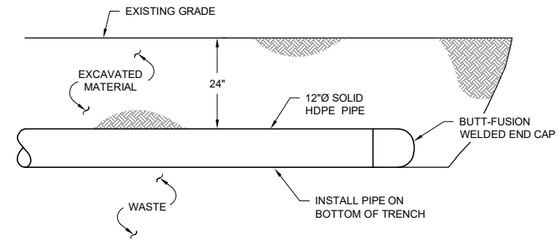

TEMPORARY SOLID PIPE TERMINATION

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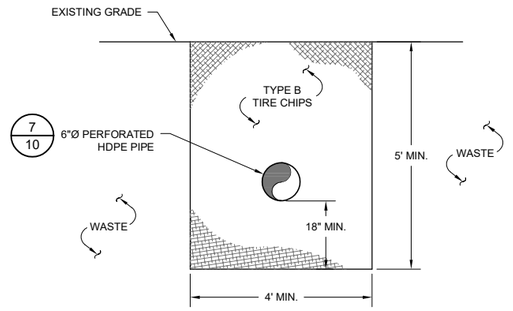

LFG COLLECTION TRENCH

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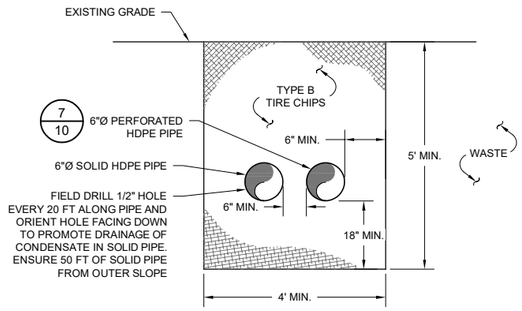
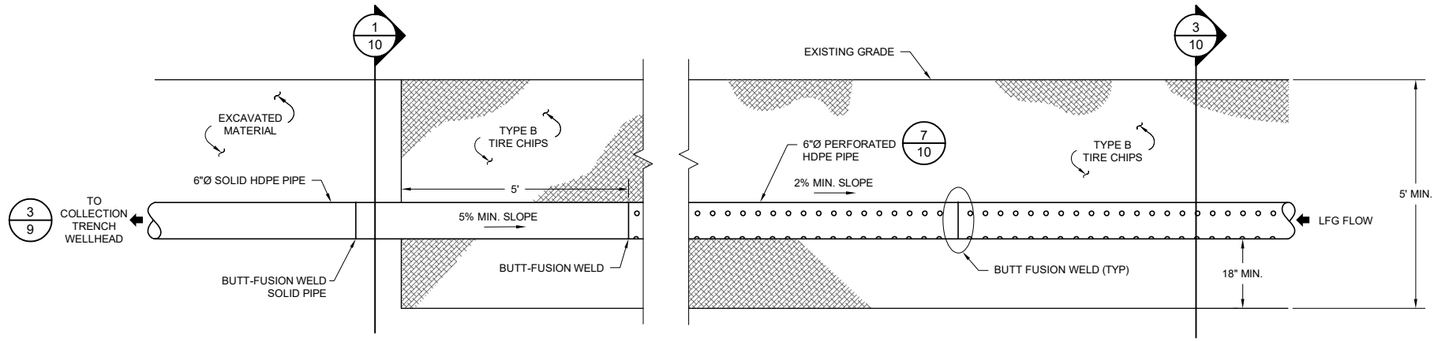


DUAL PIPE LFG COLLECTION TRENCH

4

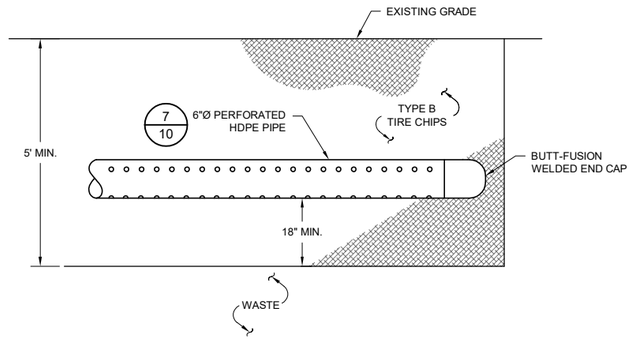
NOT TO SCALE



LFG COLLECTION TRENCH TRANSITION

5

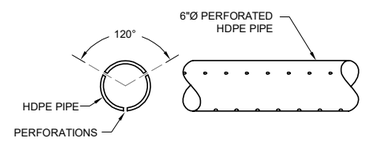
NOT TO SCALE



COLLECTION TRENCH TERMINATION

6

NOT TO SCALE



NOTE:

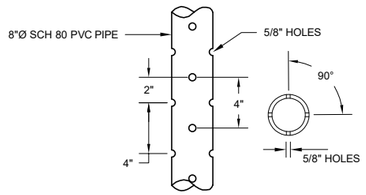
1. HOLES SHALL BE 1/2"Ø DRILLED HOLES SPACED 12" APART ALONG THE LENGTH OF THE PIPE OR APPROVED EQUIVALENT BY OWNER.

PERFORATED HDPE PIPE

7

NOT TO SCALE

(GAS COLLECTION TRENCHES)



NOTES:

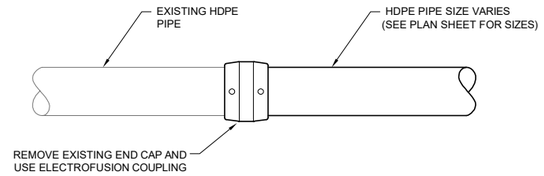
1. PERFORATIONS SPACED 90° APART HORIZONTALLY.
2. PERFORATIONS SPACED 4" APART VERTICALLY.
3. 90° AND 270° ROWS STAGGERED 2" BELOW 0° AND 180° ROWS.

PERFORATED PVC PIPE

8

NOT TO SCALE

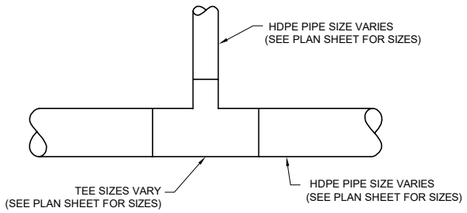
(LFG EXTRACTION WELLS)



EXISTING CONVEYANCE PIPE CONNECTION

9

NOT TO SCALE



PLAN VIEW

"TEE" INSTALLATION

10

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE TIMOTHY W REED No. 12655 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

DETAILS

SHEET NUMBER: 10 OF 12

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C:\Program Files (x86)\Autodesk\Revit Architecture 2015\Materials\Textures\
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FILE P:\2500s\2536.31\Graphics\Revit\Cell 12\Design\09 - 12 - Details.dwg
Last Saved By: Brian.Blanchard
CPB PLT: By Author
PLOT DATE: 12/18/19

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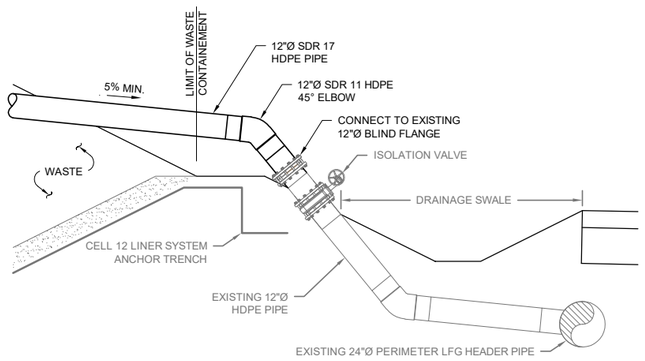
NOTES:

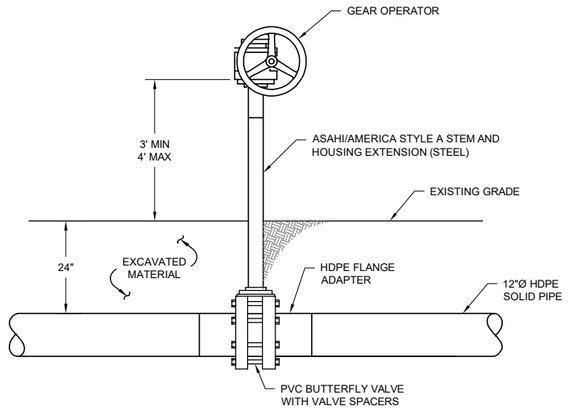
1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.



CONNECTION AT PERIMETER HEADER

1

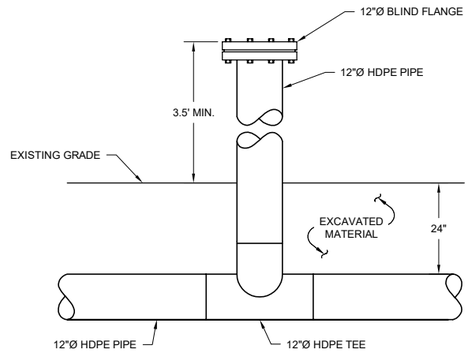
NOT TO SCALE



ISOLATION VALVE

2

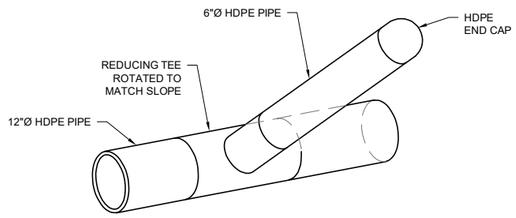
NOT TO SCALE



VERTICAL RISER

3

NOT TO SCALE

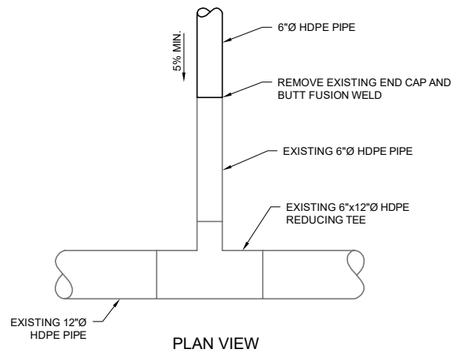


ISOMETRIC VIEW

6"Ø PIPE STUB

4

NOT TO SCALE

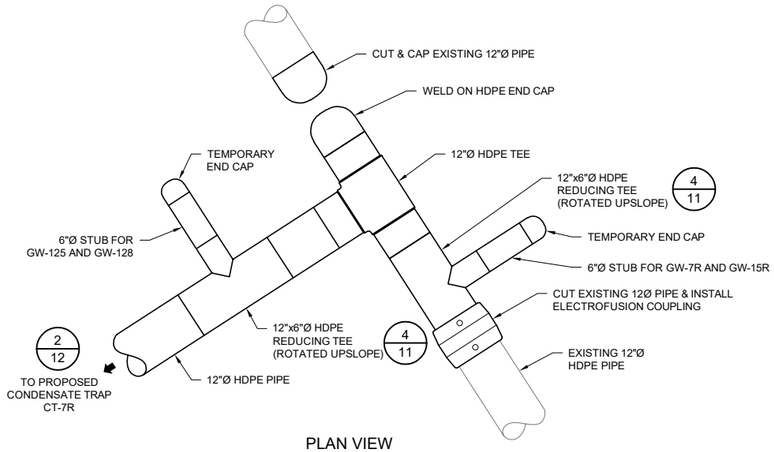


PLAN VIEW

CONNECTION TO EXISTING 6"Ø STUB

5

NOT TO SCALE

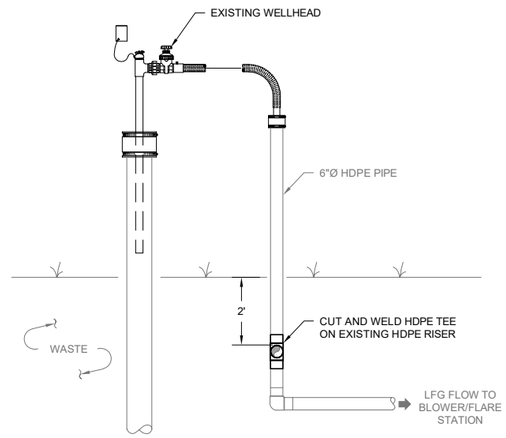


PLAN VIEW

CELL 7 HEADER CONNECTION

6

NOT TO SCALE



CONNECT TO VACUUM SOURCE AT EXISTING LFG WELL

7

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE TIMOTHY W REED No. 12555 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

DETAILS

SHEET NUMBER: 11 OF 12

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C:\Program Files (x86)\Dvd\Soft\Tools\WARIOUT.BAP

PRINTED: P:\2536\LF\Revit\Cell 12\Design\Sh - 00 - Details.dwg
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P:\2536\LF\2536.31\Graphics Files\CAD\Cell 12\Design\02 - 07 - Development Plans.dwg

FILE: P:\2536\LF\2536.31\Graphics Files\CAD\Cell 12\Design\Sh - 00 - Details.dwg
USER: rclay
CTB FILE: 8in4.ctb/model.ctb
PLOT DATE: 12/19/19

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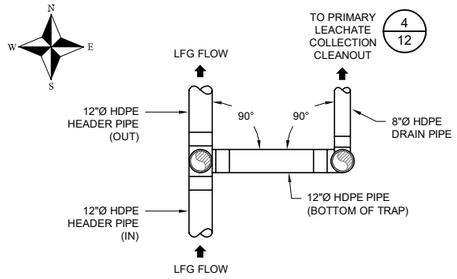
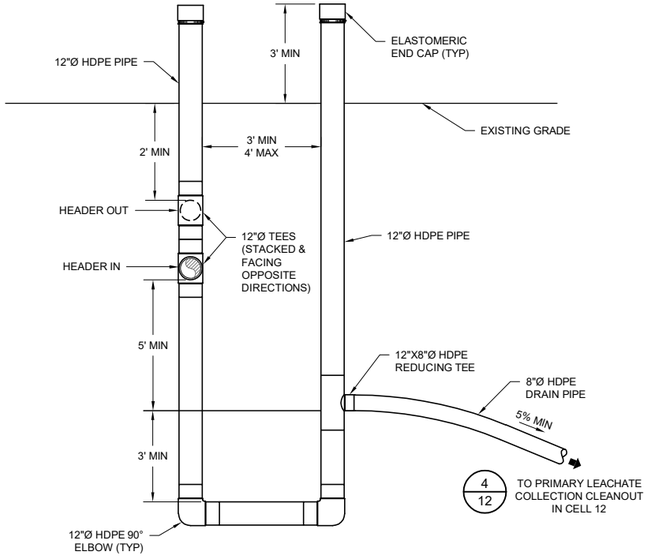


PLAN VIEW

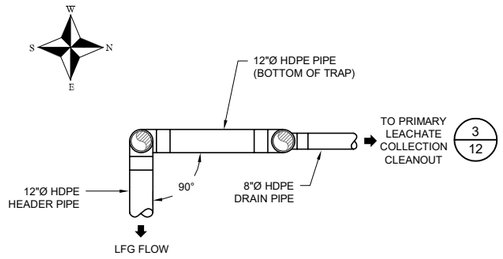


ELEVATION VIEW

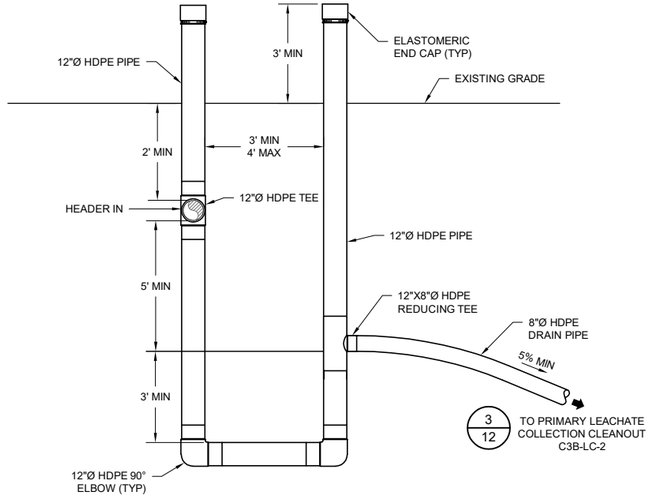
CONDENSATE TRAP CT-12

1

NOT TO SCALE



PLAN VIEW



ELEVATION VIEW

REPLACEMENT CONDENSATE TRAP CT-7R

2

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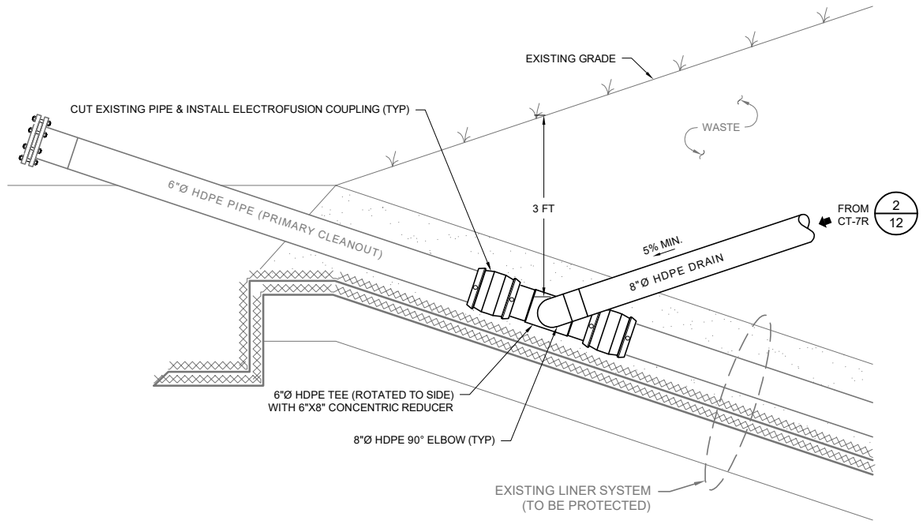


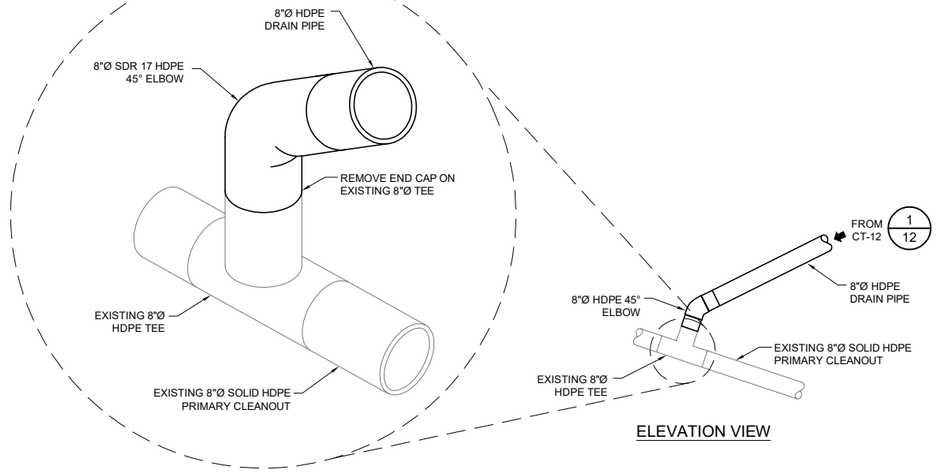
SECTION VIEW

DRAIN TIE-IN TO CELL 3B PRIMARY CLEANOUT

3

NOT TO SCALE

(CLEANOUT C3B-LC-2)



ELEVATION VIEW

DRAIN TIE-IN TO CELL 12 PRIMARY LEACHATE COLLECTION CLEANOUT

4

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE TIMOTHY W REED No. 12655 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: R. CLAY
DESIGNED BY: R. CLAY
REVIEWED BY: R.CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: DECEMBER 2019

CELL 12 LFG SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.31

DETAILS

SHEET NUMBER: 12 OF 12

FILE: P:\2500\2536.31\Graphics\Final\CAD\Cell 12\Cell 12 drawings\Cell 12 - Details.dwg
LAST SAVED BY: Brett.Blanchard
CAD FILE: Brett.Blanchard
PLOT DATE: 12/16/19

CELL 13 Development / Landfill Gas System Expansion Drawings

JUNIPER RIDGE LANDFILL
CELL 13 DEVELOPMENT

1.0 CELL 13 SYSTEM OVERVIEW

Cell 13 is approximately 7.3 acres in size and provides approximately 1,000,000 cubic yards of disposal capacity. Cell 13 abuts existing Cell 12, and its liner system will transition and connect to the liner systems of this cell. The location and base grades for Cell 13 are shown on Figure 13-1. Cell 13 will be constructed in 2021 to be available for waste placement in 2021.

The Cell 13 liner system will consist of a composite leachate collection and primary liner, a leak detection system, and a secondary liner.

The composite leachate collection and primary liner will consist of the following components:

- A 12-inch layer of sand ($K \geq 5x10^{-3}$ cm/sec);
- A network of 6-inch and 8-inch diameter perforated HDPE pipe;
- A geocomposite drainage net;
- An 80-mil high-density polyethylene (HDPE) textured geomembrane;
- A geosynthetic clay liner (GCL); and
- A 12-inch clay barrier soil layer (hydraulic conductivity (K) less than or equal to $1x10^{-7}$ cm/sec).

The leak detection system has been designed to detect leaks within 30 days and will consist of the following components:

- A 12-inch layer of sand ($K \geq 5x10^{-3}$ cm/sec);
- A network of 6-inch diameter perforated HDPE pipe;
- A geocomposite drainage net; and
- A dedicated leak detection pump system.

The secondary liner will consist of a 60-mil HDPE textured geomembrane. Directly below the secondary liner system will be 12 inches of clay with a hydraulic conductivity (K) less than or equal to $1x10^{-7}$ cm/sec.

Leachate Collection

The Cell 13 leachate collection system consists of a 12-inch layer of granular material with a hydraulic conductivity greater than 5 $x10^{-3}$ cm/sec, perforated HDPE laterals (minimum diameter 6 inches) and a perimeter transport pipe (minimum diameter 8 inches), stone pipe filters, and a drainage geocomposite. The leachate collection system is a gravity drain system which flows to the Cell 13 temporary collection sump and pump system located at the northeast corner of the Cell. The Cell 12 collection sump area will be connected to Cell 13, and the Cell 12 leachate pumps will be relocated to the Cell 13 pump station. Cleanouts are provided for the Cell 13 leachate laterals and perimeter transport piping.

The Cell 13 leachate pump system consists of a primary 5-horsepower pump, located in the bottom of the sump and accessed through a 24-inch riser pipe, and a secondary 5-horsepower pump, located in a separate 24-inch riser pipe directly adjacent to the primary 24-inch riser. The primary pump has the ability to pump design flows, while the secondary pump serves as a backup. Both pumps are piped through a header system to a temporary force main that is connected to the existing dual-containment leachate force main infrastructure in the northeast corner of the permitted expansion area that was installed during Cell 12 construction. The leachate generation and pumping calculations are provided in Appendix A-2 of the Cell 13 Design Report. The existing force main conveys leachate to the 900,000-gallon aboveground storage tank (AST) for temporary storage prior to trucking the leachate off-site for treatment.

Leak Detection

Liquids that collect in the Cell 13 leak detection layer drain to the leak detection sump, located on the northeast side of the cell. The sump has a 1 horsepower pump that pumps liquids into the leachate collection sump. The leak detection pump system is equipped with a flow meter and sample port to monitor leak detection flows and water quality. The leak detection system has the hydraulic capacity to transmit the predicted flows associated with the Cell 13 primary liner action leakage rate and rapid and large leakage rate. A small wooden structure will be built over both the leachate and leak detection piping to provide weather protection.

2.0 CELL 13 DEVELOPMENT

Initial conditions prior to waste placement into Cell 13 are shown on Figure 13-1. After the initial placement of the 5-foot soft/frost-protection layer within Cell 13, waste placement and operations of Cell 13 will be performed in accordance with the operating procedures contained in Section 7.0 of the JRL Operations Manual. The five (5) stages of waste placement are shown on Figures 13-2 through 13-6, respectively. Associated operational details are shown on Figures 13-7, 13-8 and 13-9: final cover termination, final cover system, cover system anchor trench, and intermediate berm base liner connection

(Figure 13-7); leachate collection inlet, temporary mid-slope intermediate berm, perimeter berm intermediate cover, temporary up-slope stormwater diversion berm and Cell access road entrance ramp (Figure 13-8), and downspout section, perimeter berm downspout profile and plunge pool (Figure 13-9). Access to Cell 13 will initially be from the northwest corner of the Cell off the existing access road. The road will be constructed over the perimeter berm as detailed on Figure 13-8.

Portions of Cell 13 waste placement will piggy-back onto the northern sideslope of Cell 12. Prior to filling against the northern sideslope of Cell 12, temporary cover materials will be removed to the height of the next waste lift, and temporary up-slope stormwater diversion berms will be constructed to divert clean stormwater runoff away from the active operating area as detailed on Figure 13-8. During the initial waste placement operations along the perimeter of Cell 13, the waste will be placed to allow the infiltration of stormwater that comes in contact with exposed waste to drain into the perimeter drainage stone or sand. After the intermediate geomembrane cover is installed during the first stage of Cell 13 construction, this area will become a temporary stormwater drainage ditch that will direct stormwater to the perimeter ditch.

Waste placement operations in Cell 13 will progress until Stage 1 grades are achieved as shown on Figure 13-2. Runoff from the intermediate geomembrane covering the sideslopes of Stage 1 will flow via a temporary stormwater ditch to ditches constructed along the inside edge of the perimeter berm of Cell 13, as previously described. The runoff will then be conveyed by way of perimeter ditch to the stormwater structures located outside of the Cell. The perimeter ditch will be constructed of geomembrane and will include a riprap plunge pool at the bottom of the slope as shown on the detail on Figure 13-9.

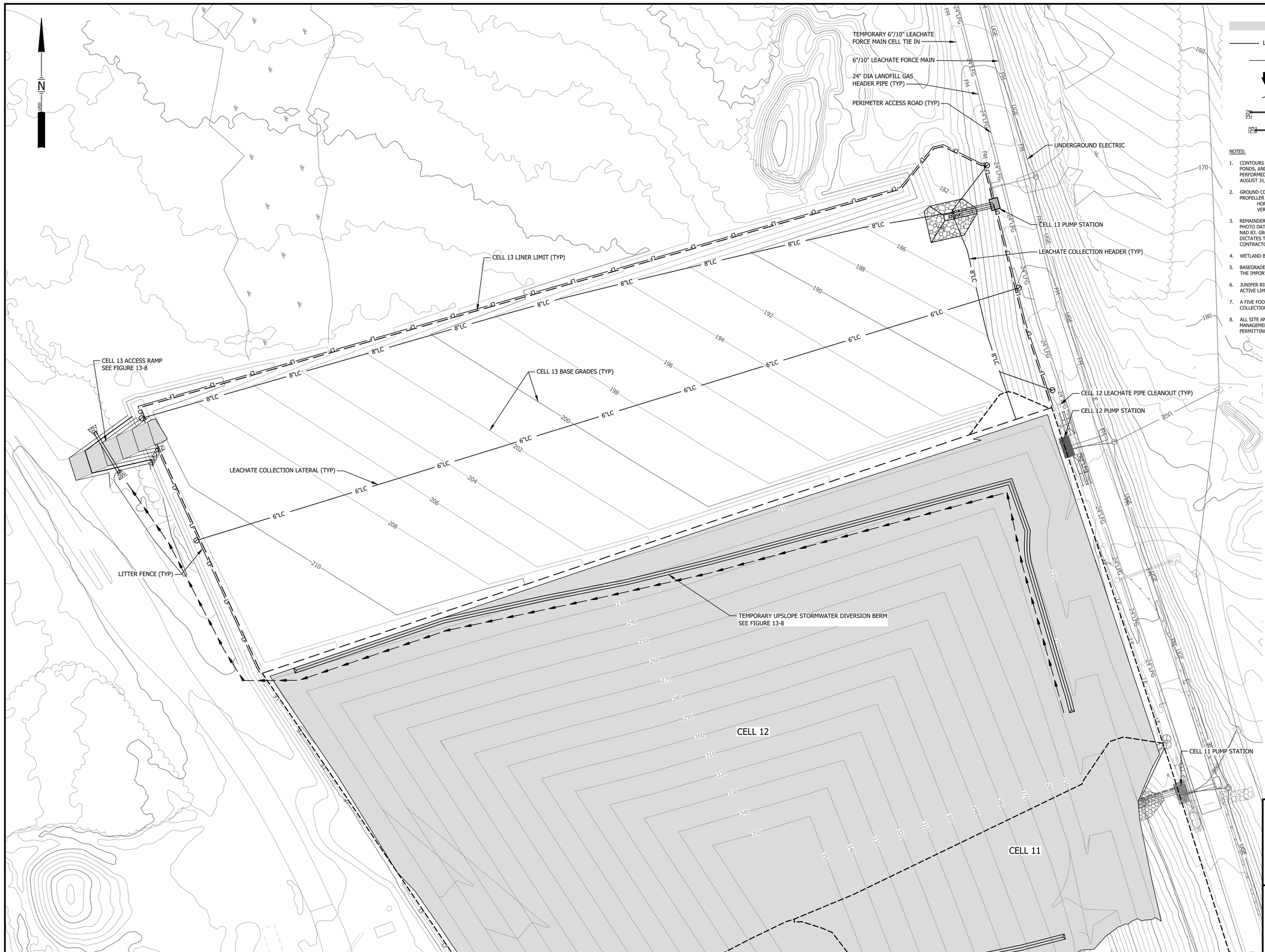
Operational controls and waste filling will progress for Stages 2, 3, 4, and 5 (as shown on Figures 13-3, 13-4, 13-5, and 13-6, respectively). As the waste elevation approaches the final elevation in each stage, the mid-slope intermediate berms, leachate transport piping, leachate collection inlets, landfill gas infrastructure and intermediate geomembrane cover are installed to be ready for the operation of the next stage. The filling of Stages 2, 3, 4, and 5 will include the construction of the landfill access road which incorporates a 2-foot high berm on the outside edge of the access road and a 2-foot deep stormwater ditch on the inside edge of the road and graded as shown on Figures 13-2 through 13-6. The waste below the landfill access road and any berms constructed of waste must be a high shear strength waste such as construction and demolition debris. High strength waste is defined as waste with adequate strength such that it can be piled while maintaining sideslopes of 1 horizontal to 1 vertical (1H:1V). High strength wastes would not include materials such as sludges or other high moisture content materials.

The stormwater ditch along the landfill access road will be lined with temporary geomembrane cover following completion of Cell 13 Stage 5 waste placement. The stormwater ditch will direct clean runoff from the upper portion of the covered landfill via culverts to the lower portion of the landfill where it is

directed to the stormwater ditch located along the landfill access road. Upon completion of the cell development stages of Cell 13, intermediate cover will be in place over the entire waste surface of the developed area and maintained until the final cover is constructed over this area.

3.0 LANDFILL GAS INFRASTRUCTURE PLACEMENT

The landfill gas infrastructure will be placed as described in Appendix J of the JRL Operations Manual and as shown on the Landfill Gas Development Plans included in Appendix D of the Design Report.



LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

NOTES:

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, AND ACCESS ROADS, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED AUGUST 31, 2020.
2. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC (SME) OF CUMBERLAND, MAINE USING PROPELLER AEROPOINTS, DATED NOVEMBER 15, 2019:
   HORIZONTAL DATUM - NAD83 MAINE, WEST, US FT.
   VERTICAL DATUM - NAVD 88, US FT.
3. REMAINDER OF BASE MAP PREPARED BY AERIAL SURVEY & PHOTO, NORRIDGEWOCK, MAINE. PHOTO DATE 6/26/2020. HORIZONTAL DATUM MAINE STATE COORDINATE SYSTEM EAST ZONE, NAD 83. GROUND CONTROL BY PLISGA & DAY, BANGOR, MAINE. STANDARD PRACTICE DICTATES THAT PLANS COMPILED IN THIS MANNER SHOULD BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. WETLAND BOUNDARIES DELINEATED BY STANTEC OF TOPSHAM, MAINE.
5. BASEGRADES WITHIN CELL 13 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
6. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

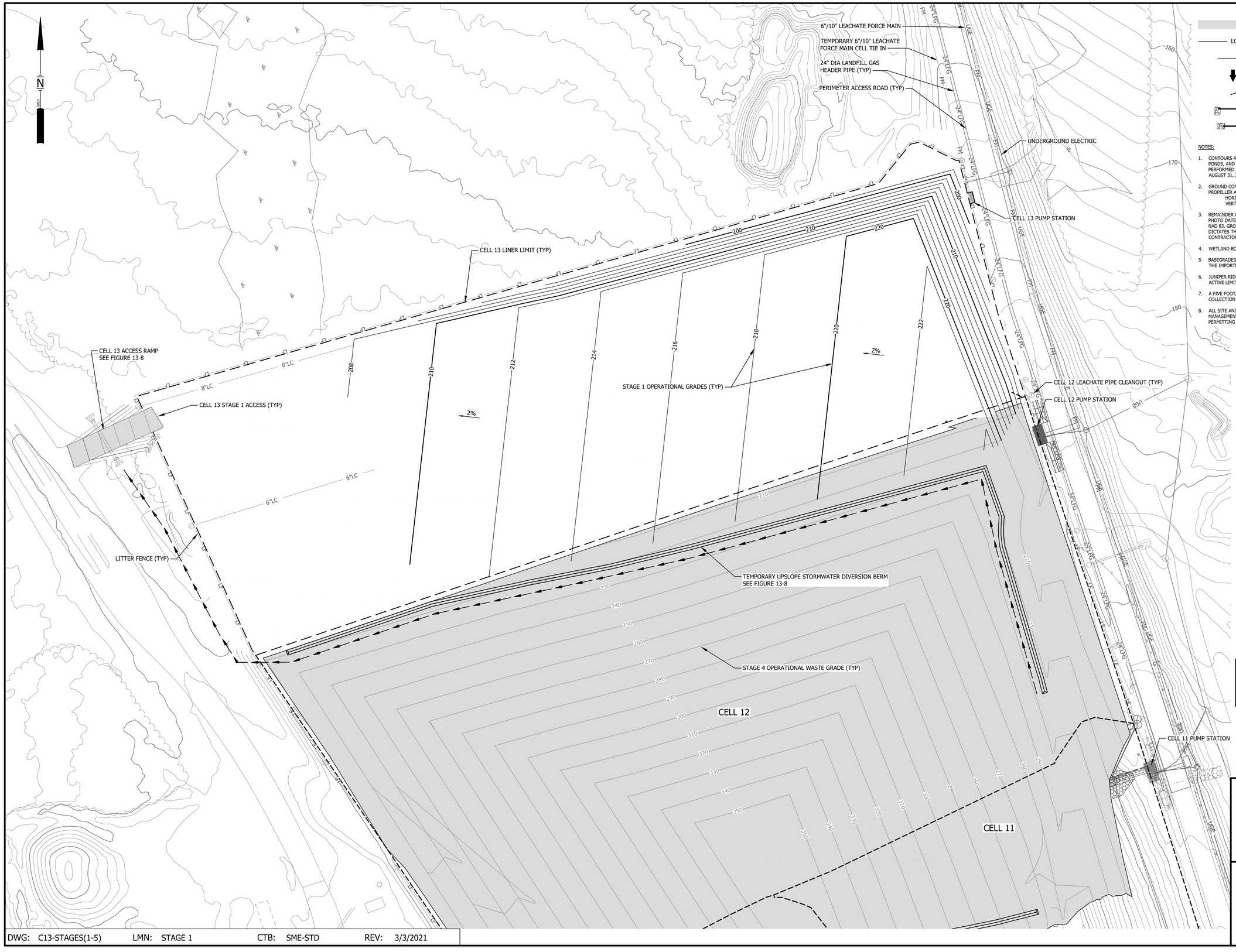
CELL 13 LINED AREA = 7.3 ACRES

25 0 50 100 FEET

FIGURE 13-1
CELL 13 - DEVELOPMENT INITIAL CONDITIONS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

DWG: C13-STAGES(1-5) LMN: INITIAL CTB: SME-STD REV: 3/3/2021

SME
SEVEE & MAHER ENGINEERS
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE
4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021
Phone 207.829.5016 • Fax 207.829.5692 • smemaine.com



LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

NOTES:

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, AND ACCESS ROADS, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED AUGUST 31, 2020.
2. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC (SME) OF CUMBERLAND, MAINE USING PROPELLER AEROPOINTS, DATED NOVEMBER 15, 2019:
   HORIZONTAL DATUM - NAD83 MAINE, WEST, US FT.
   VERTICAL DATUM - NAVD 88, US FT.
3. REMAINDER OF BASE MAP PREPARED BY AERIAL SURVEY & PHOTO, NORRIDGEWOCK, MAINE. PHOTO DATE 6/26/2020. HORIZONTAL DATUM MAINE STATE COORDINATE SYSTEM EAST ZONE, NAD 83. GROUND CONTROL BY PLISGA & DAY, BANGOR, MAINE. STANDARD PRACTICE DICTATES THAT PLANS COMPILED IN THIS MANNER SHOULD BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. WETLAND BOUNDARIES DELINEATED BY STANTEC OF TOPSHAM, MAINE.
5. BASEGRADES WITHIN CELL 13 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
6. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

ESTIMATED STAGE 1 CAPACITY
120,744 CY INCLUDING SOFT LAYER VOLUME = 41,820 CY

25 0 50 100 FEET

FIGURE 13-2
CELL 13 - DEVELOPMENT - STAGE 1
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

SME
SEVEE & MAHER ENGINEERS
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE
4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021
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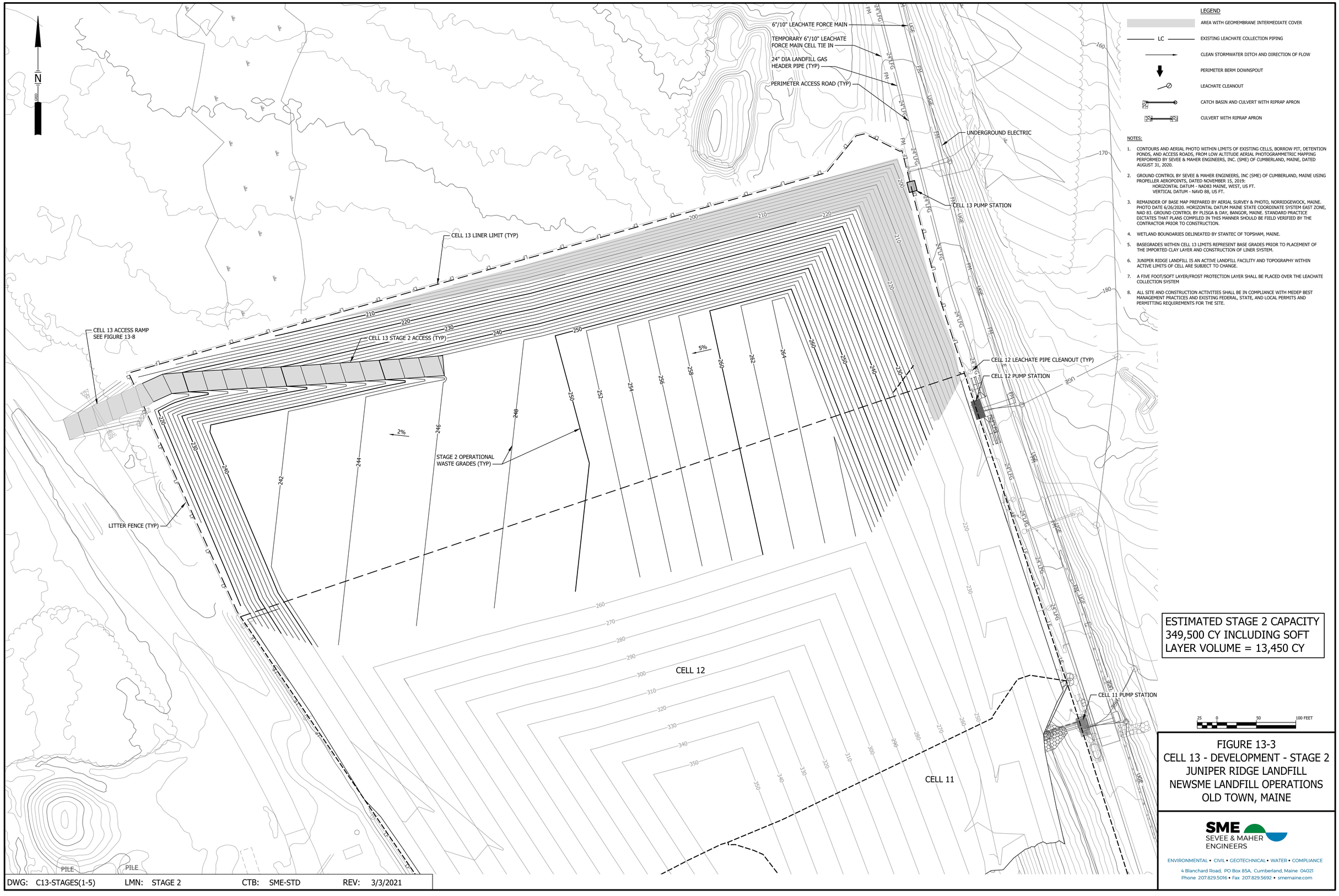
DWG: C13-STAGES(1-5) LMN: STAGE 1 CTB: SME-STD REV: 3/3/2021



LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

NOTES:

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, AND ACCESS ROADS, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED AUGUST 31, 2020.
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4. WETLAND BOUNDARIES DELINEATED BY STANTEC OF TOPSHAM, MAINE.
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8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

ESTIMATED STAGE 2 CAPACITY
349,500 CY INCLUDING SOFT LAYER VOLUME = 13,450 CY

25 0 50 100 FEET

FIGURE 13-3
CELL 13 - DEVELOPMENT - STAGE 2
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

DWG: C13-STAGES(1-5) LMN: STAGE 2 CTB: SME-STD REV: 3/3/2021

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N

6"/10" LEACHATE FORCE MAIN

TEMPORARY 6"/10" LEACHATE FORCE MAIN CELL TIE IN

24" DIA LANDFILL GAS HEADER PIPE (TYP)

PERIMETER ACCESS ROAD (TYP)

UNDERGROUND ELECTRIC

CELL 13 PUMP STATION

CELL 13 LINER LIMIT (TYP)

CELL 13 TERRACE BERM

CELL 13 STAGE 3 ACCESS (TYP)

CELL 13 ACCESS RAMP SEE FIGURE 13-8

CELL 12 LEACHATE PIPE CLEANOUT (TYP)

CELL 12 PUMP STATION

6"LC

STAGE 3 OPERATIONAL WASTE GRADES (TYP)

LEACHATE COLLECTION INLET AND PIPING SEE FIGURE 13-XX

LITTER FENCE (TYP)

2%

CELL 12

CELL 11

CELL 11 PUMP STATION

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
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ESTIMATED STAGE 3 CAPACITY
257,000 CY

25 0 50 100 FEET

FIGURE 13-4
CELL 13 - DEVELOPMENT - STAGE 3
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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N

6"/10" LEACHATE FORCE MAIN

TEMPORARY 6"/10" LEACHATE FORCE MAIN CELL TIE IN

24" DIA LANDFILL GAS HEADER PIPE (TYP)

PERIMETER ACCESS ROAD (TYP)

UNDERGROUND ELECTRIC

CELL 13 PUMP STATION

CELL 13 LINER LIMIT (TYP)

CELL 13 TERRACE BERM

CELL 13 ACCESS RAMP
SEE FIGURE 13-8

CELL 12 LEACHATE PIPE CLEANOUT (TYP)

CELL 12 PUMP STATION

LEACHATE COLLECTION INLET AND PIPING
SEE FIGURE 13-XX

LITTER FENCE (TYP)

STAGE 4 OPERATIONAL
WASTE GRADES (TYP)

2%

CELL 13 STAGE 4 ACCESS (TYP)

CELL 11

CELL 11 PUMP STATION

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
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ESTIMATED STAGE 4 CAPACITY
190,600 CY

25 0 50 100 FEET

FIGURE 13-5
CELL 13 - DEVELOPMENT - STAGE 4
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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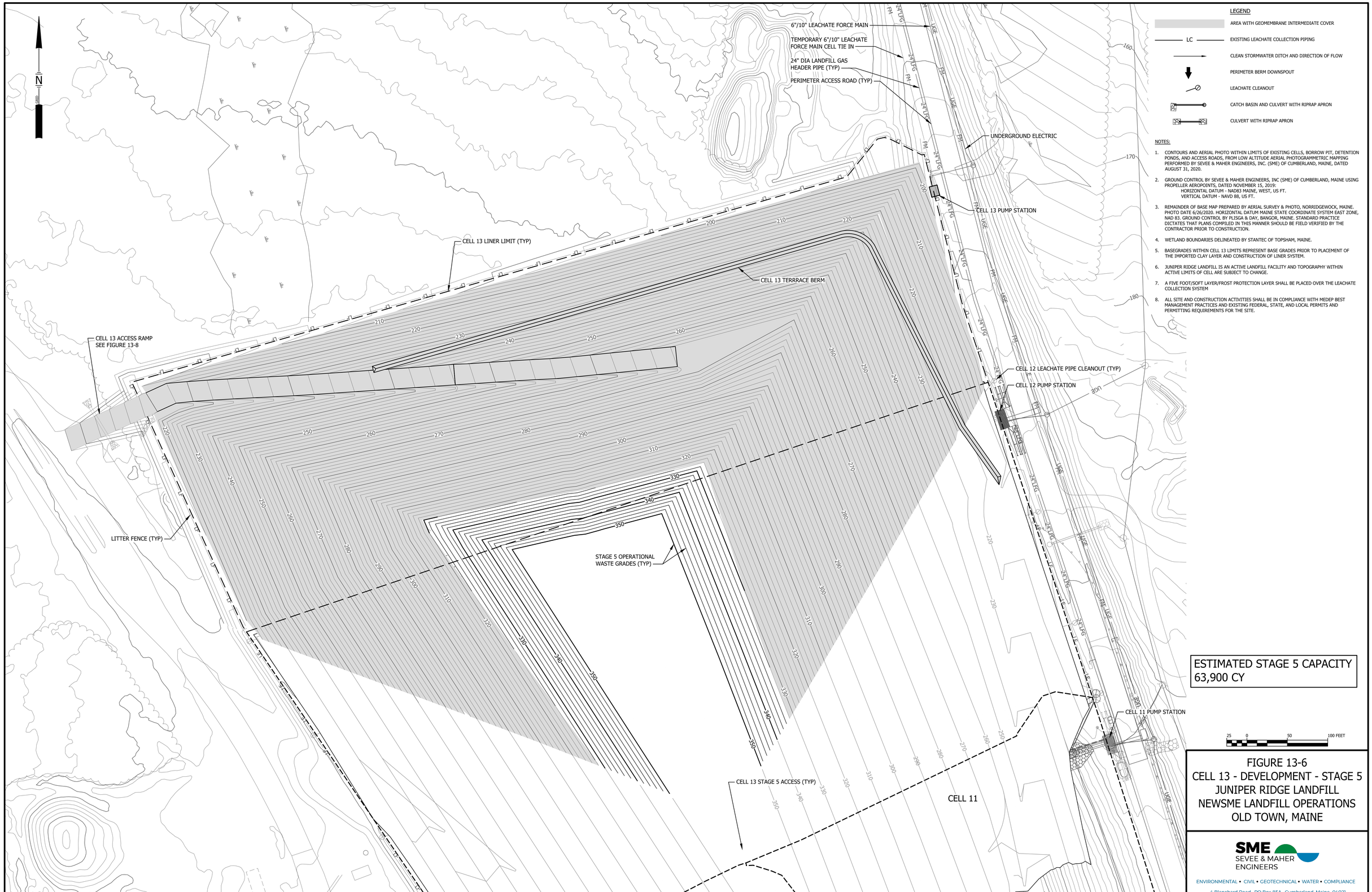

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ESTIMATED STAGE 5 CAPACITY
63,900 CY

25 0 50 100 FEET

FIGURE 13-6
CELL 13 - DEVELOPMENT - STAGE 5
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

DWG: C13-STAGES(1-5) LMN: STAGE 5 CTB: SME-STD REV: 3/3/2021

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SANBORN HEAD

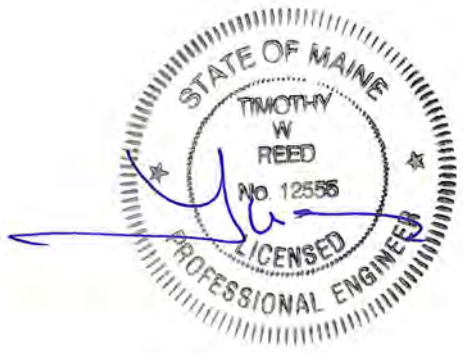
Building Trust. Engineering Success.

Technical Specifications
Cell 13 Landfill Gas System Expansion
Juniper Ridge Landfill
Old Town, Maine

Prepared for
NEWSME Landfill Operations, LLC
Old Town, Maine

Prepared by
Sanborn, Head & Associates, Inc.
20 Foundry Street
Concord, New Hampshire

File 2536.34
March 2021



CONTENTS

DIVISION 2 - SITE WORK

Section 02560 - Landfill Gas Extraction Wells
Section 02565 - Landfill Gas Trenches

SECTION 02560

LANDFILL GAS EXTRACTION WELLS

PART 1 - GENERAL

1.1 SCOPE OF APPLICATION

A. Supply all equipment, materials, and labor needed to install landfill gas extraction wells as specified herein and as indicated on the Drawings.

1.2 SUBMITTALS

A. Submit to ENGINEER Certificates of Compliance on materials furnished, and manufacturer's brochures containing complete information and instructions pertaining to the storage, handling, installation, and inspection of pipe and appurtenances furnished.

B. Submit to ENGINEER well logs within 7 days of the completion of well installations.

C. The well logs shall depict a construction diagram for each well drilled, including the total depth of the well, the temperature of spoils, depth, thickness, and description of soil or waste strata, and the occurrence of any water bearing zones.

1.3 SITE CONDITIONS

A. Obstructions and saturated conditions such as sludges, and foundry sands are sometimes encountered when drilling in landfills, many of which can be drilled through. CONTRACTOR is expected to make reasonable effort to drill through obstructions and saturated conditions and will be paid for offset redrilling and boring abandonment only with prior written approval from OWNER.

B. Well drilling shall be performed on a level surface. CONTRACTOR shall provide a level surface at each drilling location as required. The size of the level area shall be acceptable to the drilling subcontractor. Any soil placed to level the drilling location shall be removed following well installation. If soil placed for leveling contacts refuse, it shall be disposed of in the active area of the landfill.

PART 2 - PRODUCTS

2.1 BALLAST STONE

A. Ballast Stone shall be hard, durable, and resistant to weathering and to water action, free from overburden, spoil, and organic materials. Ballast Stone shall

be washed, and uniformly blended according to the particle size distribution requirements shown below.

Sieve Size	Percent Passing by Weight
2-inch	100
1½-inch	90 - 100
1-inch	30 - 40
¾-inch	10 - 15
½-inch	0 - 5
⅜-inch	0 - 5

2.2 BENTONITE SEAL

A. Bentonite Seal shall be constructed using hydrated bentonite chips or pellets.

2.3 SAND/GRAVEL FILTER

A. Sand/Gravel Filter should conform to the following particle size distribution.

Sieve Size	Percent Passing by Weight
1½-inch	100
No. 4	70 - 100
No. 40	30 - 80
No. 200	0 - 15

2.4 COMMON FILL

A. Common Fill should be soil containing no stone larger than 4 inches, and shall have a maximum of 75 percent passing the No. 40 sieve and a minimum of 35 percent passing the No. 200 sieve.

2.5 PVC PIPE

A. Refer to Specification Section 15212.

2.6 WELLHEAD

A. Wellheads should be nominal 2-inch size QED Quick Change Orifice Plate wellhead, with elastomer adapter kits, or equivalent approved by OWNER. The wellhead components are indicated on the Drawings.

B. Wellhead and flow measurement tube shall be compatible with the CES/LANDTEC GEM-2000™ and GEM-5000™ Landfill Gas Monitors.

PART 3 - EXECUTION

3.1 DRILLING

A. ENGINEER shall observe all drilling operations.

B. Wells shall be drilled to the minimum diameter and the specific depths shown on the Drawings. CONTRACTOR shall drill the wells using bucket-type augers and dry drilling equipment; wet rotary drilling equipment may not be used.

C. Well depths shown on the Drawings are estimated based on projected top of waste elevations and may be adjusted in the field by ENGINEER. At no time shall the drilling extend deeper than the bottom of well screen elevation.

D. If water is encountered in a borehole, then CONTRACTOR may be directed to drill beyond the point that it was encountered. If wet conditions remain, then drilling may be terminated and the length of perforated pipe adjusted by ENGINEER, or the well may be relocated. If wet conditions cease (e.g., due to trapped water layer), then drilling will continue to the design depth.

E. As soon as drilling is completed, a safety screen shall be placed over the top of the borehole. This screen shall stay in place until backfilling is within 4 feet of the surface. Safety screen size should be large enough to accommodate all backfill materials and any tools used during backfill yet not large enough for any human to accidentally fall through.

F. Wells shall be drilled straight and plumb and the well pipe shall be installed in the center of the borehole. CONTRACTOR will take all compression off of the pipe by mechanical means and center the pipe in the middle of the borehole before starting to backfill.

G. PVC well pipe shall be solvent cemented and mechanically fastened with stainless steel fasteners.

3.2 BACKFILLING

A. Backfilling the borehole shall commence immediately after drilling is completed and the PVC pipe has been installed. Backfill materials shall be installed as indicated on the Drawings and as approved by ENGINEER.

B. Ballast Stone shall be poured or scooped through the safety screen at a rate that will not endanger the integrity of the well casing and limits the potential for bridging.

C. The Sand/Gravel Filter shall be poured through the safety screen until a layer at least 1-foot thick above the Ballast Stone is formed.

D. The Bentonite Seal will be formed by evenly distributing bentonite around the annulus of the well until a minimum plug thickness of 1 foot has been achieved.

E. Common Fill shall be rodded in the boring to provide even distribution and compaction.

3.3 DISPOSAL

A. Refuse from well drilling operations shall be hauled to the active face of the landfill operation the same day it is excavated.

[END OF SECTION 02560]

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SECTION 02565

LANDFILL GAS TRENCHES

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. CONTRACTOR shall provide all labor, materials, equipment, and incidentals necessary to excavate and backfill trenches for the landfill gas management system as shown on the Drawings and specified herein, including, but not limited to: excavation of waste; placement of soil, aggregate, and pipe; compaction of soil; and grading.

PART 2 – PRODUCTS

2.1 GENERAL

A. All soil, unless otherwise specified, shall consist of clean soil substantially free from organic materials, wood, trash, and other objectionable materials that may be compressible or that cannot be properly compacted. Soil shall not contain stone blocks, broken concrete, masonry rubble, or other similar materials. Soil shall have physical properties such that it can be readily spread and compacted to the specified density. Snow, ice, and frozen soil shall not be permitted.

B. Unless otherwise specified, the maximum soil particle size shall be no larger than two-thirds the loose lift thickness.

2.2 MATERIALS

A. Tire Chips shall be provided by the OWNER and shall be placed in accordance with ASTM D6270.

B. HDPE pipe and fittings refer to Specification Section 15210.

PART 3 - EXECUTION

3.1 GENERAL EXCAVATION BELOW GRADE

A. CONTRACTOR shall plan and perform earthwork activities to prevent damage to existing structures, safeguard people and property, minimize disruptions to site traffic, protect the structures to be installed, and provide safe working conditions in compliance with local safety regulations and provisions of the Occupational Safety and Health Act (OSHA).

B. Excavation shall be made to the elevations and dimensions shown on the Drawings. Excavate sufficient material to provide suitable room for construction providing bracing and support as required.

3.2 EXCAVATION IN WASTE

A. CONTRACTOR shall take safety precautions during construction activities that conform to all OSHA regulations and the safety requirements of OWNER and the Specifications.

B. Trenches shall be excavated to the depths, widths, and alignments shown on the Drawings.

C. CONTRACTOR shall separate cover soil from excavated refuse to the extent possible. Cover soil may be used to backfill trenches. Excavated material not suitable for use as soil shall be transported to the working face as directed by OWNER.

D. Pockets of perched leachate may be encountered during waste excavation activities. CONTRACTOR shall immediately notify OWNER and ENGINEER when leachate is encountered. ENGINEER will provide CONTRACTOR with directions on how to manage the leachate in narrative and/or drawing form. Potential leachate management techniques may include one or a combination of the following.
   1. Backfilling the affected area.
   2. Realigning the trench.
   3. Installing a French drain.

E. To the extent possible, the trench invert shall slope uniformly as indicated on the Drawings.

F. CONTRACTOR shall not excavate more trench than can be backfilled in one day after placement of the pipe. Excavations shall not be left open overnight.

3.3 BACKFILL

A. Excavated material shall be placed in loose layers and compacted to the extent possible with the goal of establishing a firm, even surface. The loose lift thickness shall not exceed 12 inches.

B. ENGINEER does not have to be present, and does not supervise or direct the actual Work by CONTRACTOR, his/her employees, or agents. Neither the presence of ENGINEER nor any observations and testing performed by ENGINEER shall excuse CONTRACTOR from defects discovered in their Work.

[END OF SECTION 02565]

CONTENTS

DIVISION 15 - MECHANICAL

Section 15210 – High-Density Polyethylene Pipe (HDPE), Fittings, and Appurtenances

Section 15212 - Polyvinyl Chloride (PVC) Pipe and Fittings

SECTION 15210

HIGH DENSITY POLYETHYLENE (HDPE) PIPE, FITTINGS, AND APPURTENANCES

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Furnish and install HDPE pipe and fittings for the landfill gas extraction system.

B. Pressure test HDPE pipe.

1.2 DELIVERY, STORAGE, AND HANDLING

A. The pipe and fitting manufacturer shall package products for shipment in a manner suitable for safe transport by commercial carrier. When delivered, CONTRACTOR shall inspect the shipment and report any damage to the pipe and fittings manufacturer. Pipe and fittings shall be handled, installed, and tested in accordance with manufacturer's recommendations, and the requirements of this Section.

B. Pipe Storage:
   1. Store or stack pipe to prevent damage from marring, crushing or puncture. Limit maximum stacking height to 6 feet or manufacturer's recommended maximum height, whichever is less.
   2. Store in accordance with manufacturer's recommendations.

C. Pipe Handling:

   1. Protect pipe from excessive heat or harmful chemicals.
   2. Handle pipe and use equipment needed to avoid gouging of the pipe surfaces.

PART 2 - PRODUCTS

2.1 PHYSICAL PROPERTIES:

A. Materials used for the manufacture of PE pipe and fittings shall meet the following physical property requirements:

Property	Unit	Test Procedure	Value
Material Designation	-	PPI/ASTM	-
PPI Material Listing	-	PPI TR-4	PE 4710
Cell Classification	-	ASTM D3350	445474C
Density	g/cm3	ASTM D1505	>0.941
Melt Index [E]	g/10 min	ASTM D1238	<0.15
Flexural Modulus	psi	ASTM D790	110,000 and <160,000
Tensile Strength	psi	ASTM D638	3000 to 3500
PENT	hours	ASTM F1473	>100
HDB	psi	ASTM D2837	1600 at 23^{0} C
UV Stabilizer [C]	% Carbon Black	ASTM D1603	2 to 3
Elastic Modulus	psi	ASTM D638	110,000
Brittleness Temperature	^{o}F	ASTM D746	<-180
Vicat Softening Temperature	^{o}F	ASTM D1525	255
Thermal Expansion	in/in/ ^{o}F	ASTM D696	8 x 10E-5
Hardness	Shore D	ASTM D2240	64
Molecular Weight Category	-	-	Extra High

B. There shall be no evidence of splitting, cracking, or breaking when the pipe is tested.

C. Ring Stiffness Constant (RSC) values for the pipe shall be 90 percent of the nominal.

D. The pipe and fittings shall be homogenous throughout and free from visible cracks, holes, foreign inclusions, or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density, and other physical properties.

E. Clean rework or recycled material generated by the manufacturer's own production may be used so long as the pipe or fittings produced meet all the requirements of this Section.

2.2 PIPE AND FITTINGS

A. Dimensions:
   1. Pipe Dimensions: The nominal inside diameter of the pipe shall be true to the specified pipe size in accordance with ASTM D2513. Standard laying lengths shall be 40 feet $\pm$ 2 inches.
   2. Fitting Dimensions: Fittings such as couplings, wyes, tees, adaptors, etc. for use in laying pipe shall have standard dimensions that conform to ASTM D3261.
   3. Pipe shall be SDR-17. Fitting shall be SDR-11 or SDR-17.

B. Pipe and fittings shall be produced from identical materials meeting the requirements of this Section. Special or custom fittings may be exempted from this requirement.

C. Pipe and fittings shall be pressure rated to meet the service pressure requirements specified. Fittings shall be fully pressure rated to at least the same service pressure rating as the joining pipe.

D. Molded fittings shall meet the requirements of ASTM D3261 and this Section. At the point of fusion, the outside diameter and minimum wall thickness of fitting butt fusion outlets shall meet the diameter and wall thickness specifications of the mating system pipe. Fitting markings shall include a production code that identifies the location and date of manufacture. Upon request, the manufacturer shall provide an explanation of his production code.

E. Marking:
   1. Each standard and random length of pipe and fitting shall be clearly marked with the following information:
      a. Manufacturer's Name or Trademark;
      b. ASTM Standard Designation;
      c. Nominal Pipe Size;
      d. Class & Profile Number;
      e. Production Code, including Extrusion Date, and Lot or Batch Number; and
      f. Standard Dimension Ratio.

F. The pipe and fitting manufacturer shall certify that samples of production pipe have undergone stress regression testing, evaluation, and validation in accordance with ASTM D2837 and PPI TR-3. Under these procedures, the minimum hydrostatic design basis shall be certified by the pipe and fitting manufacturer to be 1600 psi at 73.4° F and 800 psi at 140° F.

G. Material shall be listed in the name of the pipe and fitting manufacturer by the Plastics Pipe Institute (PPI) in PPI TR-4 with the following Standard Grade ratings:

		73.4° F	140° F
1.	Hydrostatic Design Basis (HDB)	1,600 psi	800 psi
2.	Hydrostatic Design Stress (HDS)	800 psi	400 psi

H. PPI material listing in the name of the resin supplier is not acceptable in meeting this requirement.

I. Certification:
   1. As the basis of the acceptance of the material, the manufacturer shall furnish a certificate of conformance of this Section upon request. When prior agreement is being made in writing between CONTRACTOR and the

manufacturer, the manufacturer shall furnish other conformance certification in the form of affidavit of conformance, test results, or copies of test reports.

2.3 GASKETS AND HARDWARE

A. All gaskets shall be Viton or other similar materials approved by OWNER. Joint hardware shall be Type 304 stainless steel.

2.4 FITTINGS

A. Fittings shall be manufactured from polyethylene compound having cell classification equal to or exceeding compound used in pipe to ensure compatibility of polyethylene resins.

B. Dimensions of fittings conforming to standard dimensions and tolerances in accordance with ASTMD 3261.

C. Fittings shall have the same or higher pressure rating as pipe.

D. Markings:
1. Manufacturer's name or trademark.
2. Nominal size.
3. Type of plastic pipe (i.e., PE 4710).
4. Standard dimension ratio.
5. Extrusion date, lot number or batch number.

E. The Drawings do not show all fittings that may be required. Provide all fittings required for a complete installation.

PART 3 – EXECUTION

3.1 FIELD QUALITY CONTROL

A. Pipe may be rejected for failure to conform to any of the following:
1. Fractures or cracks passing through pipe wall, except single crack not exceeding 2 inches in length at either end of pipe, which may be cut off and discarded. All pipes within one shipment shall be rejected if defects exist in more than five percent of shipment or delivery.
2. Cracks sufficient to impair strength, durability, or service ability of pipe.
3. Defects indicating improper proportioning, mixing, and molding.
4. Damaged ends, where such damage prevents making satisfactory joint.
5. Damage due to handling or installation. Scratches and gouges exceeding five percent of the wall thickness shall be considered excessive, and may be rejected by ENGINEER or OWNER.

B. Acceptance of fittings, stubs, or other specially fabricated pipe sections shall be based on visual inspection by ENGINEER and documentation of conformance to this Section.

C. Prior to backfilling trench CONTRACTOR shall obtain as-built top of pipe coordinates and elevations at grade changes, terminations, fittings, and at least every 50 feet along the pipe.

3.2 INSTALLATION

A. Trench, backfill, and compact in accordance with Specification Section 02565.

B. Heat Fusion of Pipe:

1. Weld pipe in accordance with manufacturer's recommendation for butt fusion methods. The pipe manufacturer shall certify fusion machine operators.
2. Butt fusion equipment for joining procedures shall be capable of meeting conditions recommended by pipe manufacturer including, but not limited to, temperature, alignment, and fusion pressures.
3. Branch saddle fusions shall be joined in accordance with manufacturer's recommendations and procedures. Branch saddle fusion equipment shall be of a size to facilitate saddle fusion within the trench.
4. For cleaning pipe ends, solutions such as detergents and solvents, when required, shall be used in accordance with manufacturer's recommendations. Solvents shall not be used unless approved by OWNER.
5. Do not bend pipe to greater degree than minimum radius recommended by manufacturer for type and grade.
6. Do not subject pipe to strains that will overstress or buckle pipe or impose excessive stress on joints.
7. Before butt fusing pipe, observe inside of each pipe length for presence of dirt, sand, mud, shavings, and other debris or animals. Remove debris from pipe prior to fusing.
8. Cap open ends of fused pipe at end of each working day to prevent entry by animals, debris, or stormwater.
9. Use compatible fusion techniques when polyethylenes of different melt indexes are fused together. Refer to manufacturer's specifications for compatible fusion.

C. Flange Jointing:
1. Use on flanged pipe connection sections.
2. At a minimum convoluted stainless steel backup rings shall be used for joining HDPE pipes below grade, and epoxy-coated carbon steel backup flanges shall be used above grade, unless stainless steel is specified by OWNER.
3. Butt fuse fabricated flange adapters to pipe or use electrofusion couplings.
4. Observe the following precautions in connection of flange joints:

a. Use full-face gaskets only.
b. All fasteners and back-up rings shall be Type 18-8 or Type 304 stainless steel below grade, and zinc-plated steel above grade.
c. Align flanges or flange/valve connections to provide tight seal.
d. U.S. Standard round washers may be used on some flanges when in accordance with manufacturer's recommendations. Bolts shall be lubricated prior to installation.

5. Protect below grade bolts and flanges by covering with a 6-mil thick PE wrap. Duct tape wrap to HDPE pipe.
6. Electrofusion couplers, where used, shall be installed per manufacturer's specifications. The outside diameter of the HDPE pipe and face shall be prepared in accordance with manufacturer's recommendations prior to installing the coupler.

D. Pipe Placement:
1. Grade control equipment shall be of the type to accurately maintain design grades and slopes during installation of pipe.
2. Unless otherwise specifically stated, install pipe in accordance with manufacturer's recommendations.
3. Maximum lengths of fused pipe to be handled as one section shall not exceed 400 feet and shall be placed according to the manufacturer's recommendations as to pipe size, pipe SDR, and topography so as not to cause excessive gouging or surface abrasion. Pipe wall gouges deeper than 3/16-inch may be cause for rejection of the pipe.
4. Cap pipe sections longer than single joint (usually 40 feet) on both ends during placement except during fusing operations.
5. Remove dirt or debris from inside of pipe before backfilling.
6. Notify ENGINEER prior to installing pipe into trench and allow time for observation. CONTRACTOR shall correct irregularities identified during observation.
7. Complete connections within trench whenever possible to prevent overstressed connections.
8. Allow pipe sufficient time to adjust to trench temperature prior to testing, fusion welding, making segment connections, or backfilling activity.
9. To reduce branch saddle stress, install saddles at slope equal to and continuous with connecting pipe.
10. Install reducers adjacent to laterals and tees unless directed otherwise.
11. Place pipe system in trench allowing at least 12 in./100 ft. for thermal contraction and expansion.

3.2 PIPE TESTING

A. CONTRACTOR shall perform a pneumatic test of the non-perforated pipe and fittings, with the exception of the 50-feet of solid pipe installed in the horizontal collection trenches, after placement in the trench, in accordance with manufacturer's recommendations.

B. Pipes shall be pressure tested in presence of ENGINEER. Provide adequate notice to ENGINEER before performing test.

C. Pneumatic testing shall be performed as follows:
   1. The test period at the test pressure shall last no more than 10 minutes.
   2. Provide all necessary connections, bulkheads, flanges, bracing, and blocking, as well as all required test equipment.
   3. Test pressure gauge shall have a recommended range of 20 psig, with minor gradations no greater than 0.1 psig.
   4. Pipe to be tested shall be exposed in the trench, except bends, reduced pressure rated fittings and components, which shall be buried or restrained. Flange connections shall be visible to check for leaks.
   5. Test pressure shall be 10 psig.
   6. Acceptance
      a. Test shall be accepted if the pressure drop over 10 minutes is less than 5 percent of the pressure at the beginning of the test period.

D. Test Report
   1. ENGINEER shall prepare and submit to OWNER a test report using the attached forms for each pipe system tested. Include following information in test report.
      a. Date of test.
      b. Description and identification of pipe system tested.
      c. Type of test performed.
      d. Test fluid.
      e. Test pressure.
      f. Results of test.
      g. Type and location of leaks detected.
      h. Corrective action taken to repair leaks.
      i. Results of retesting.
      j. Name of person performing test.

[END OF SECTION 15210]

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ATTACHMENT 1 TO SECTION 15210
PIPE PRESSURE AIR TEST LOG

SANBORN HEAD		Project No.:	
		Project Name:	
		Project Location:	
		Weather:	
Contractor:		Test No.:	
CQA Personnel:		Person/Company Performing the Test:	
Date of Test:		Time of Test:	Finish:
Pipe Length: ~ ft.	Pipe Diameter: in.	Pipe Material:	Pipe SDR/Sch.:
Rated Working Pressure:		Test Pressure: psi	
Location/designation of pipe tested:			

t Time (min.)	T Pipe Temperature (ºC)	P_t Pressure Gauge Reading (psig)	P_c Pressure Drop (%)
0			
5			
10			
15			
30			
60			

Pass	Fail	Retest? Yes	No

Description of leaks and repairs of retested pipe segments:

P_c = Percent Pressure Drop $\frac{P_o - P_t}{P_o} \times 100$

P_o = Initial Pressure Gauge Reading

P_t = Pressure Gauge Reading at Time t

Comments:

Signature:

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SECTION 15212

POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Supply polyvinyl chloride (PVC) Schedule 80 pipe and fittings as shown on the Drawings.

1.2 SUBMITTALS

A. Submit to ENGINEER manufacturer's technical product data and installation instructions for PVC pipe and fittings.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Pipe and fittings shall be manufactured from a PVC compound which meets the requirements of Cell Classification 12454-B PVC as outlined in ASTM D1784.

B. PVC pipe used in the construction of landfill gas extraction system shall meet the requirements of ASTM D1784 and ASTM D1785 for Schedule 80 PVC pipe.

C. PVC fittings used in the construction of landfill gas extraction system shall meet the requirements of ASTM D2464 and ASTM D2467.

D. All PVC cements shall meet the requirements of ASTM D2564 for solvent cemented PVC joints.

E. Clean rework or recycle material generated by the manufacturer's own production may be used so long as the pipe or fittings produced meet all the requirements of this Section.

F. Fittings shall be industrial, heavy duty, hub style.

G. Socket fittings shall be pressure rated the same as the corresponding size pipe prescribed by ASTM D1785. Threaded fittings shall be pressure rated to at least 50 percent of the rating for socket fittings.

2.2 FLANGES

A. Flanges shall be one piece solid design or two-part Van Stone type that use the tapered, serrated face and full face gasket technique for joining and are compatible with ANSI B16.5 Class 150 metal flanges.

B. Flanges shall be pressure rated at 150 psi for water service at 73°F, non-shock and have a minimum burst requirement of 3.3 times the rated pressure.

C. Bolts shall be zinc-plated ASTM A193, Grade B8M hex head, and nuts shall be zinc-plated ASTM A194, Grade 8M hex head.

D. Gaskets shall be ⅛-inch thick, full face Viton or other similar materials approved by OWNER.

PART 3 - EXECUTION

3.1 PVC PIPE HANDLING

A. PVC pipe and pipe fittings shall be handled carefully in loading and unloading. They shall be lifted by hoists and lowered on skidways in such a manner as to avoid shock. Derricks, ropes, or other suitable equipment shall be used for lowering the pipe into well borings. Pipe and pipe fittings shall not be dropped or dumped.

3.2 PVC PIPE INSTALLATION

A. PVC pipe installation shall conform to the requirements of this Section, the manufacturer's recommendations, and as outlined in ASTM D2774V.

3.3 JOINING OF PVC PIPES

A. Pipes shall be joined in accordance with ASTM D2855.

B. Pipe shall be inspected for cuts, scratches, or other damages prior to installation. Pipe with imperfections shall not be used.

C. Burrs, chips, etc., shall be removed from pipe interior and exterior.

D. Loose dirt and moisture shall be wiped from the interior and exterior of the pipe end and the interior of the fitting.

E. Pipe cuts shall be square and perpendicular to the center line of pipe.

F. A coating of CPS primer, as recommended by pipe supplier, shall be applied to the entire interior surface of the fitting socket, and to an equivalent area on the exterior of the pipe prior to applying solvent cement.

G. The solvent cement shall comply with the requirements of ASTM D2564 and shall be applied in strict accordance with manufacturer's specifications.

H. Pipe and pipe fittings shall be selected so that there will be as small a deviation as possible at the joints, and so that inverts present a smooth surface. Pipe and fittings that do not fit together to form a tight fitting shall be rejected.

[END OF SECTION 15212]

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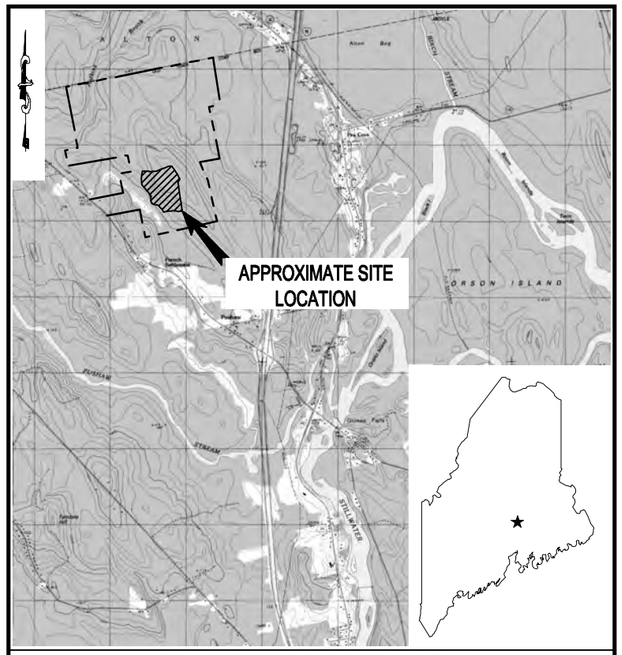
CELL 13 LANDFILL GAS SYSTEM EXPANSION DRAWINGS

JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE
MARCH 2021



FROM: USGS TOPOGRAPHIC MAP- OLD TOWN, MAINE (1988)

LOCUS PLAN
SCALE: 1"=1000'

SHEET INDEX

SHEET 1	OVERALL SITE PLAN
SHEET 2	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 1
SHEET 3	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 2
SHEET 4	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 3
SHEET 5	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 4
SHEET 6	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 5
SHEET 7	CROSS-SECTION
SHEETS 8-11	DETAILS

STATE OF MAINE TIMOTHY W. REED No. 12656 LICENSED PROFESSIONAL ENGINEER

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
MARCH 4, 2021*

PREPARED FOR:

NEWSME LANDFILL OPERATIONS, LLC

JUNIPER RIDGE LANDFILL

OLD TOWN, MAINE

PREPARED BY:

SANBORN HEAD

20 FOUNDRY STREET, CONCORD, NEW HAMPSHIRE 03301
(603) 229-1900 FAX (603) 229-1919

PROJ.#: 2536.34 "CELL 13 LANDFILL GAS SYSTEM EXPANSION DRAWINGS, JUNIPER RIDGE LANDFILL, OLD TOWN, MAINE," MARCH 2021.

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PLOT DATE: 3-4-21

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MAINTENANCE BUILDING

OFFICE BUILDING

H_2S TREATMENT BUILDING

FLARE PAD

LEACHATE STORAGE TANK

CELL 11

CELL 10

CELL 12

CELL 9

PROPOSED CELL 13

CELL 7

CELL 8

CELL 3B

CELL 6

CELL 3A

CELL 4

CELL 5

CELL 2

CELL 1

ENTRANCE ROAD

NOTES:

1. THE TOPOGRAPHY SHOWN IS A COMPILATION OF THE FOLLOWING:
   A. PHOTOGRAMMETRIC MAPPING PREPARED BY AERIAL SURVEY & PHOTO, INC. OF NORRIDGEWOCK, MAINE. PHOTO DATE: JUNE 26, 2020.
   B. LOW ALTITUDE PHOTOGRAMMETRIC MAPPING IN THE VICINITY OF CELL 12, DATED AUGUST 31, 2020, BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE.
2. HORIZONTAL DATUM IS MAINE STATE COORDINATE SYSTEM NAD83. VERTICAL DATUM IS NAVD88.
3. GRADES SHOWN IN CELL 12 ARE PERMITTED FILL GRADES.

LEGEND:

- 190 — 10-FOOT CONTOUR
- 2-FOOT CONTOUR
- LIMIT OF WASTE CONTAINMENT
- CELL LIMIT

SANBORN HEAD

GRAPHICAL SCALE
120' 60' 0' 120' 240'

STATE OF MAINE
TIMOTHY W REED
No. 12655
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.34

OVERALL SITE PLAN

SHEET NUMBER: 1 OF 11

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NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 13 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON JANUARY 25, 2021.
3. GRADES SHOWN WITHIN THE EXISTING LANDFILL FOOTPRINT REPRESENT ANTICIPATED GRADES DURING CELL 12 FILLING. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
4. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
5. THESE DRAWINGS DO NOT SHOW ALL PLANNED ACCESS ROADS. IT IS OUR UNDERSTANDING THAT CASELLA WILL ADD ACCESS ROADS WHEN AND WHERE NEEDED, AND THE DESIGN OF THE GCCS MAY CHANGE TO ACCOMODATE ACCESS ROADS.
6. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
7. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
8. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	
CT GCT-710	COLLECTION TRENCH WELLHEAD	GCT-1302
ET	COLLECTION TRENCH TERMINATION	ET
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

EAST BERM ACCESS ROAD
12"Ø ISOLATION VALVE
CONNECT 8"Ø HDPE DRAIN TO PRIMARY LEACHATE COLLECTION SYSTEM CLEANOUT
12"Ø RISER
12" STUB ROTATED UP SLOPE
COLLECTION TRENCH WELLHEAD
GCT-1301
GCT-1302
GCT-1303
50 FT MIN.
100 FT (TYP)
2% MIN
LFG COLLECTION TRENCH TERMINATION (TYP)
EXTENT OF STAGE 1 WASTE PLACEMENT
CELL 13
CELL 12
CELL 11
CELL 7
CELL 3B
CELL 3A

NO.	DATE	DESCRIPTION	BY

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE TIMOTHY W REED No. 12555 LICENSED PROFESSIONAL ENGINEER

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 1

PROJECT NUMBER: 2536.34

SHEET NUMBER: 2 OF 11

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EAST BERM ACCESS ROAD

NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 13 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON JANUARY 25, 2021.
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LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-114
GCT-710	COLLECTION TRENCH WELLHEAD	GCT-1302
	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

CELL 13
CELL 12
CELL 11
CELL 7
CELL 3B
CELL 3A

50 FT MIN.
5% MIN
2% MIN
100 FT (TYP)

SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE TIMOTHY W REED No. 12685 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 2

PROJECT NUMBER: 2536.34

SHEET NUMBER: 3 OF 11

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NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 13 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON JANUARY 25, 2021.
3. GRADES SHOWN WITHIN THE EXISTING LANDFILL FOOTPRINT REPRESENT ANTICIPATED GRADES DURING CELL 12 FILLING. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
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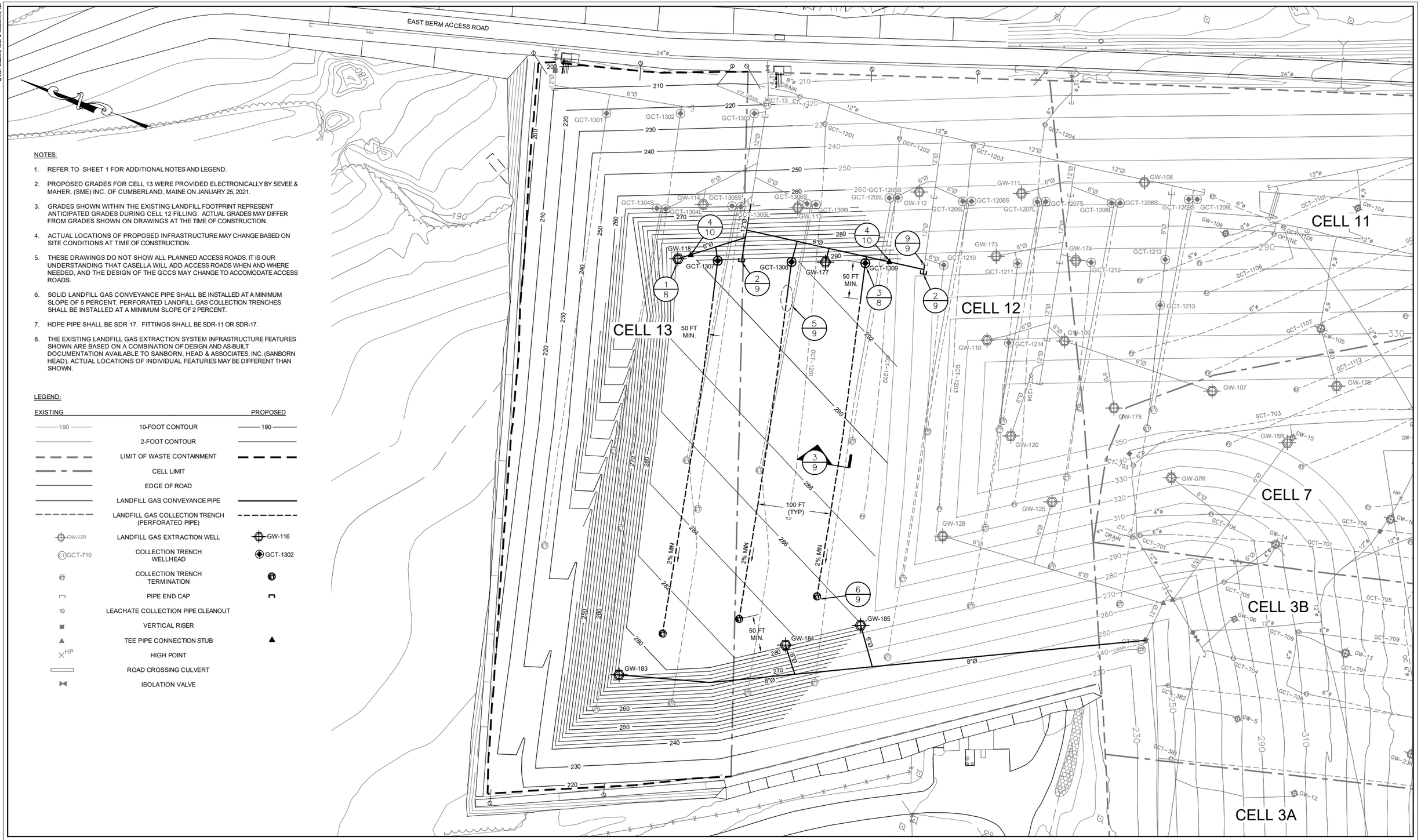
LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-116
CT GCT-710	COLLECTION TRENCH WELLHEAD	GCT-1302
	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	



SANBORN HEAD	GRAPHICAL SCALE 60' 30' 0' 60' 120'	STATE OF MAINE TIMOTHY W REED 12685 LICENSED PROFESSIONAL ENGINEER	NO. / DATE / DESCRIPTION / BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 3

PROJECT NUMBER: 2536.34

SHEET NUMBER: 4 OF 11

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NOTES:

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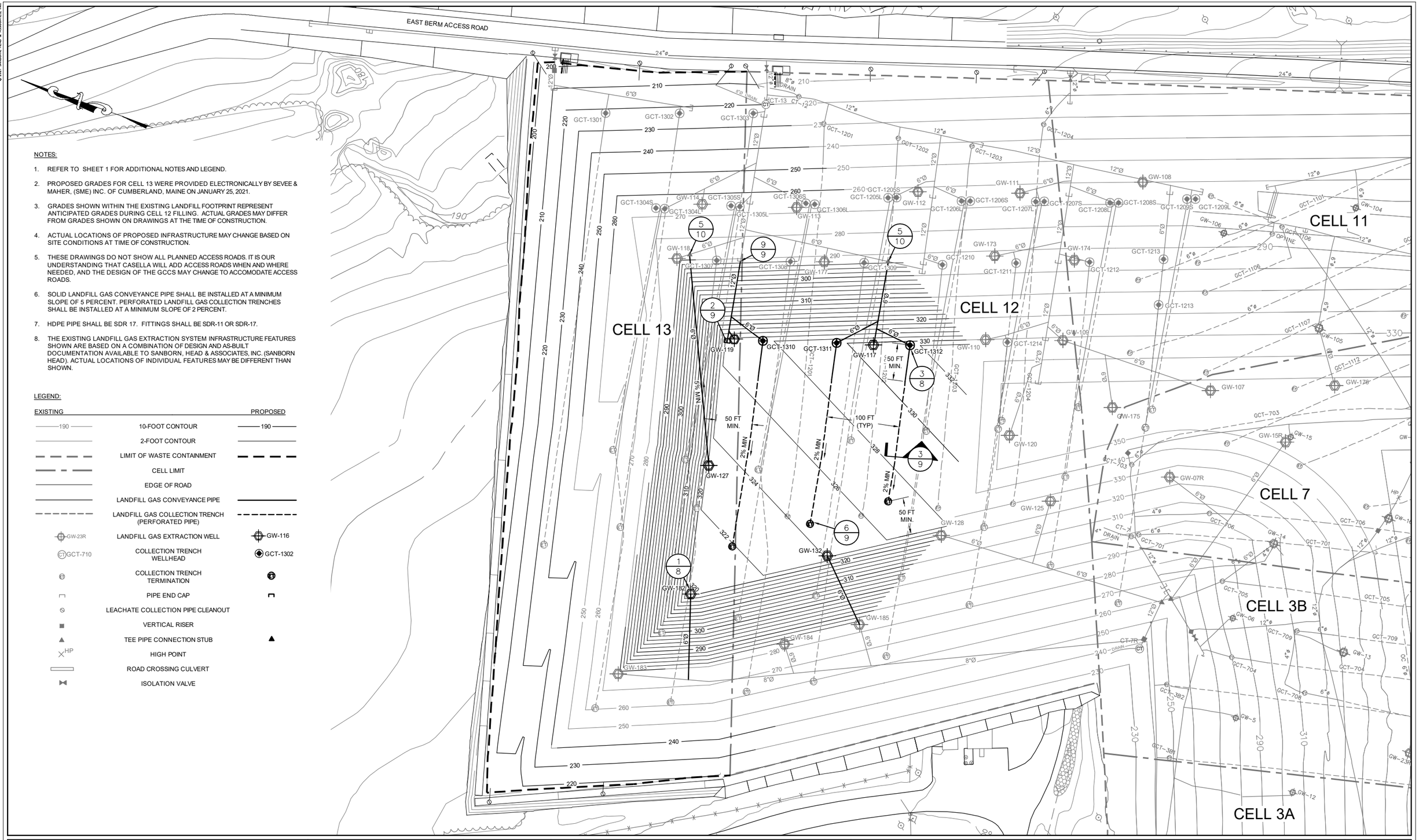
4. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
5. THESE DRAWINGS DO NOT SHOW ALL PLANNED ACCESS ROADS. IT IS OUR UNDERSTANDING THAT CASELLA WILL ADD ACCESS ROADS WHEN AND WHERE NEEDED, AND THE DESIGN OF THE GCCS MAY CHANGE TO ACCOMODATE ACCESS ROADS.
6. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
7. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
8. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-116
GCT-710	COLLECTION TRENCH WELLHEAD	GCT-1302
	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	



SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE TIMOTHY W REED No. 12555 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 4

PROJECT NUMBER: 2536.34

SHEET NUMBER: 5 OF 11

FILE: P:\2536\2536.34\Graphics\Final\CAD\Cell 13 Design\02 - 07 - Development Plan.dwg
LAYOUT: 5 of 11
USER: tmac
PLOT DATE: 3-4-21 - 9:07 AM

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NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 13 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON JANUARY 25, 2021.
3. GRADES SHOWN WITHIN THE EXISTING LANDFILL FOOTPRINT REPRESENT ANTICIPATED GRADES DURING CELL 12 FILLING. ACTUAL GRADES MAY DIFFER FROM GRADES SHOWN ON DRAWINGS AT THE TIME OF CONSTRUCTION.
4. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
5. THESE DRAWINGS DO NOT SHOW ALL PLANNED ACCESS ROADS. IT IS OUR UNDERSTANDING THAT CASELLA WILL ADD ACCESS ROADS WHEN AND WHERE NEEDED, AND THE DESIGN OF THE GCCS MAY CHANGE TO ACCOMODATE ACCESS ROADS.
6. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
7. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
8. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-116
GCT-710	COLLECTION TRENCH WELLHEAD	
	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

EAST BERM ACCESS ROAD

CELL 13

CELL 12

CELL 11

CELL 7

CELL 3B

CELL 3A

VERTICAL LFG EXTRACTION WELL (TYP) 1/8

CONNECT TO VACUUM SOURCE AT EXISTING WELL 6/10

SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE TIMOTHY W REED 10695 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.34

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 5

SHEET NUMBER: 6 OF 11

FILE: P:\2500s\2536.34\Graphics Final\CAD\Cell 13 Design\02 - EP - Development Plan.dwg
LAST SAVED BY USER: Timothy Reed
PLOT DATE: 3-4-21 9:07 AM

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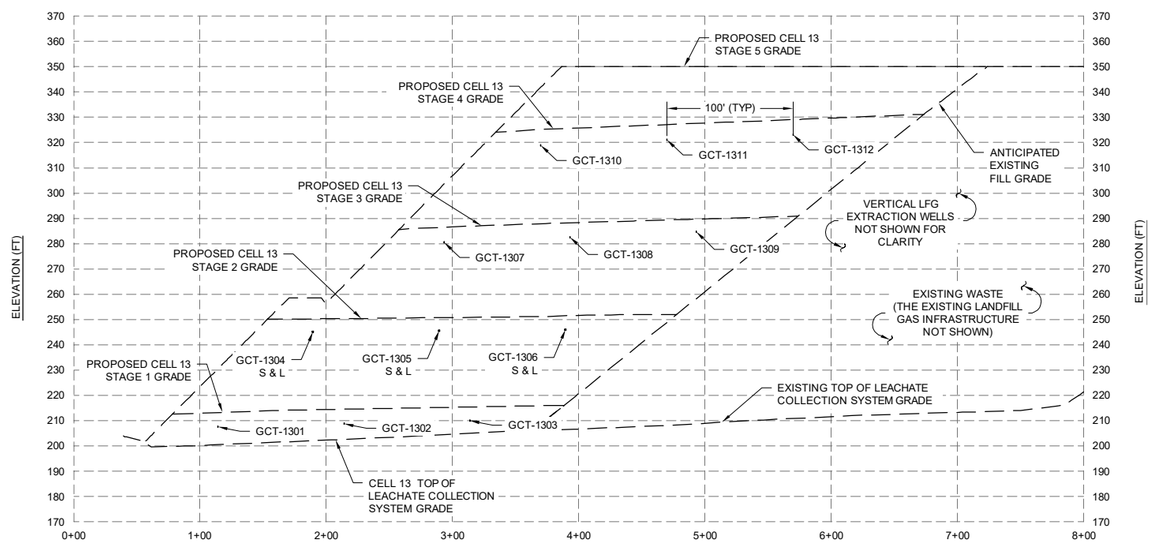
NOTES:

1. THE CROSS SECTION SHOWN ON THIS SHEET ILLUSTRATES THE PROPOSED LAYOUT AND SPACING OF GAS COLLECTION TRENCHES IN CELL 13. ACTUAL GRADES MAY DIFFER FROM THE GRADES SHOWN AT THE TIME OF CONSTRUCTION. VERTICAL WELLS ARE NOT SHOWN ON THE CROSS SECTION FOR CLARITY.
2. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.

REFERENCE PLAN



SECTION A-A'

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE TIMOTHY W REED No. 12585 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.34

CROSS-SECTION

SHEET NUMBER: 7 OF 11

FILE: P:\2500s\2536.34\Graphics\Final\CAD\Cell 13 Design\2 - GF - Development Plan.dwg
LAYOUT: 7 - SECTION
USER: TReed
PLOT DATE: 3-4-21 - 9:07 AM

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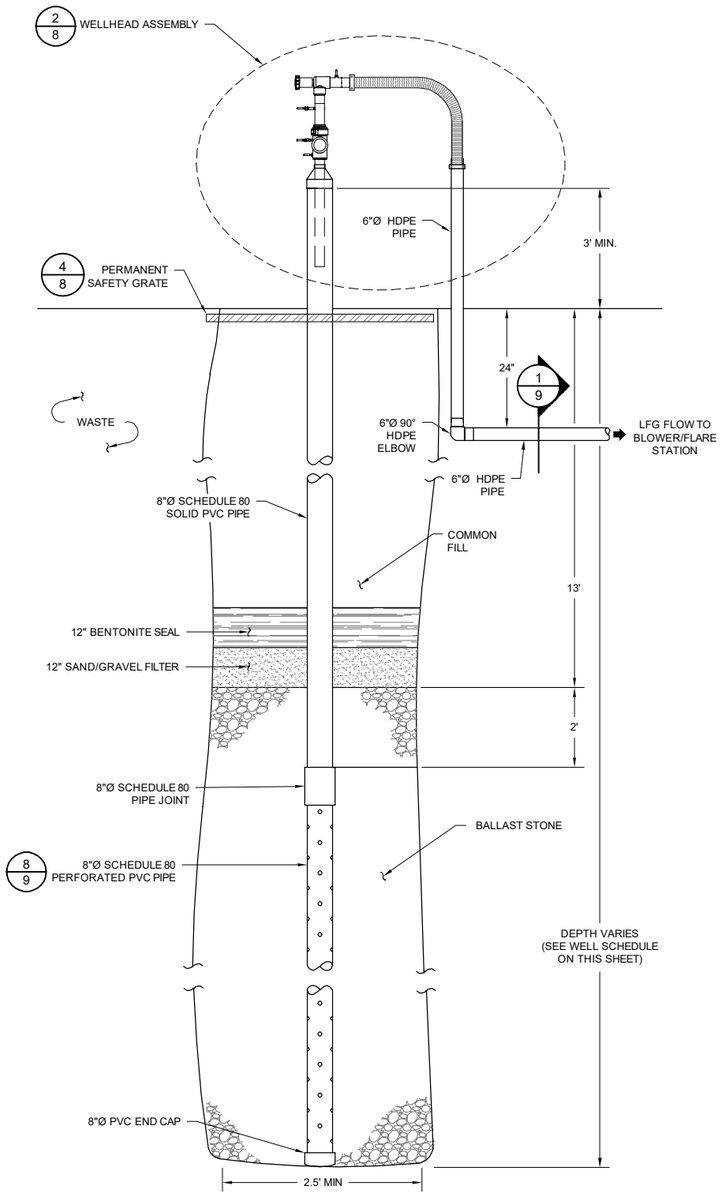


LFG EXTRACTION WELL DETAIL

1

NOT TO SCALE

NOTES:

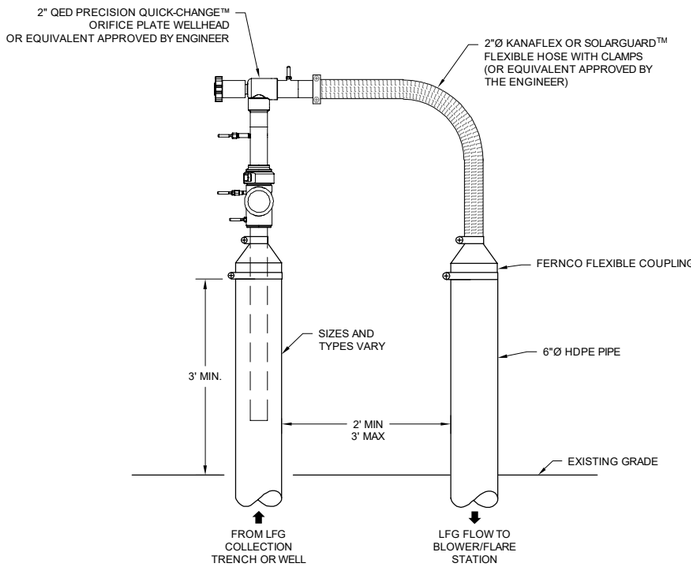
1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.

WELL SCHEDULE NOTES:

1. DRILLING SHALL NOT COMMENCE UNTIL ENGINEER IS PROVIDED AS-BUILT LINER SYSTEM GRADES FOR CELL 13 AND IS GIVEN THE OPPORTUNITY TO UPDATE THE WELL SCHEDULE ACCORDINGLY.
2. LFG EXTRACTION WELLS SHALL BE INSTALLED WITHIN ONE FOOT OF LISTED LOCATIONS AND TO THE NEAREST FOOT IN DEPTH.
3. A TEMPORARY BENCHMARK WITH GROUND SURFACE ELEVATION SHALL BE ESTABLISHED AT EACH WELL PRIOR TO DRILLING.
4. 15 FEET OF SOLID RISER IS TO BE PROVIDED BELOW INTERMEDIATE COVER GRADES. THE INTENT IS TO PROVIDE 3 FEET OF STICK UP ABOVE FILL GRADES.

WELL SCEDULE

WELL DESIGNATION	NORTHING	EASTING	BOTTOM OF WASTE (FT)	TOP OF EXISTING WASTE (FT)	TOTAL WELL DEPTH (FT)	BOTTOM OF WELL SCREEN (FT)	TOP OF WELL SCREEN (FT)	SCREEN LENGTH (FT)	TOP OF CASING ELEV. (FT)
GW-113	479970.9	926695.1	200.0	267.5	52.5	215.0	252.5	37.5	270.5
GW-114	480093.7	926655.1	197.1	264.8	52.7	212.1	249.8	37.7	267.8
GW-117	479808.1	926554.4	206.8	331.1	109.3	221.8	316.1	94.3	334.1
GW-118	480100.7	926573.7	198.4	288.9	75.5	213.4	273.9	60.5	291.9
GW-119	479989.5	926496.6	207.4	326.6	104.2	222.4	311.6	89.2	329.6
GW-124	479826.7	926479.9	207.7	350.0	127.3	222.7	335.0	112.3	353.0
GW-127	479963.3	926322.7	207.2	323.3	101.1	222.2	308.3	86.1	326.3
GW-132	479768.8	926261.9	213.4	324.7	96.3	228.4	309.7	81.3	327.7
GW-177	479909.9	926638.0	202.5	292.6	75.1	217.5	277.6	60.1	295.6
GW-178	479920.7	926409.1	206.3	350.0	128.7	221.3	335.0	113.7	353.0
GW-179	479706.6	926526.7	210.8	350.0	124.2	225.8	335.0	109.2	353.0
GW-180	479888.8	926273.0	210.8	350.0	124.2	225.8	335.0	109.2	353.0
GW-181	479739.4	926361.6	212.7	350.0	122.3	227.7	335.0	107.3	353.0
GW-182	479926.3	926148.6	211.8	320.0	93.2	226.8	305.0	78.2	323.0
GW-183	479982.4	926012.3	212.5	278.7	51.2	227.5	263.7	36.2	281.7
GW-184	479782.5	926128.3	214.5	282.9	53.3	229.5	267.9	38.3	285.9
GW-185	479695.5	926188.4	216.0	284.2	53.2	231.0	269.2	38.2	287.2



WELLHEAD NOTES:

A. WELLHEAD SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL. INSTRUCTIONS SHALL BE THOROUGHLY READ BEFORE ATTEMPTING ASSEMBLY AND INSTALLATION OF WELLHEAD.

B. WELLHEAD AND FLOW MEASUREMENT TUBE ASSEMBLY SHALL BE COMPATIBLE WITH LANDTEC GEM-2000 AND GEM-5000 LANDFILL GAS MONITORS.

C. FOR FLEXIBLE CONNECTIONS TO PIPE, USE "IPS WELD-ON 795" PLASTIC PIPE CEMENT OR EQUIVALENT APPROVED BY ENGINEER.

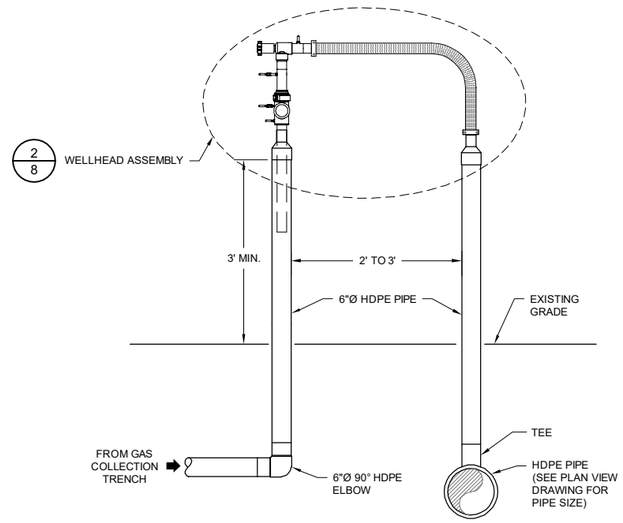
D. WARNING: DO NOT CUT THE FLOW MEASUREMENT TUBE ASSEMBLY. FAILURE TO HEED THIS WARNING WILL RESULT IN A DAMAGED OR INOPERATIVE WELLHEAD AND VOID THE WARRANTY. SUCH DAMAGE WOULD REQUIRE REPLACEMENT OF THE WELLHEAD.

E. ALLOW SUFFICIENT SLACK IN FLEX HOSE FOR PIPE EXPANSION AND CONTRACTION; AN EXTRA 8 TO 12 INCHES IS RECOMMENDED.

WELLHEAD ASSEMBLY

2

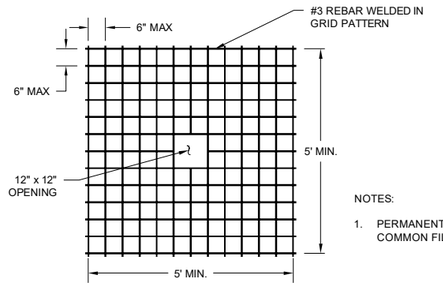
NOT TO SCALE



COLLECTION TRENCH WELLHEAD

3

NOT TO SCALE



NOTES:

1. PERMANENT SAFETY GRATE TO BE BURIED IN COMMON FILL AT EACH WELL LOCATION.

PERMANENT SAFETY GRATE

4

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE TIMOTHY W REED No. 12685 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

DETAILS

PROJECT NUMBER: 2536.34

SHEET NUMBER: 8 OF 11

FILE: P:\2536\2536.34\Graphics\Final\CAD\Cell 13 Dwg\08-11-DWR.dwg
LAYOUT: 8 of 11 - DETAILS
LOGIN: TReed
DATE: 3/4/21

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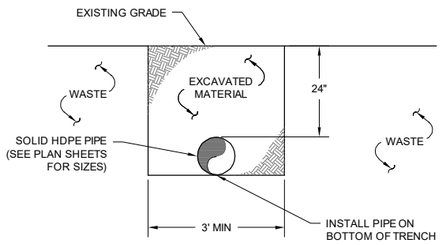
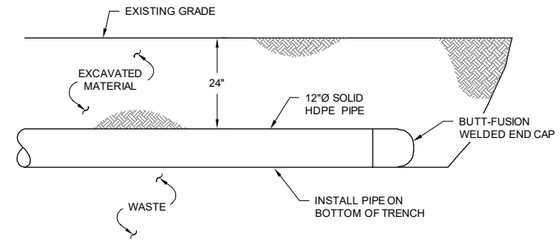
NOTES:

1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.



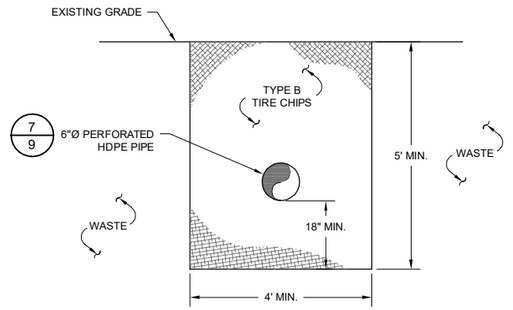
SOLID PIPE TRENCH

1 — NOT TO SCALE



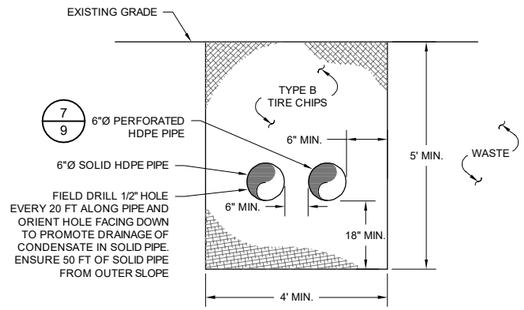
TEMPORARY SOLID PIPE TERMINATION

2 — NOT TO SCALE



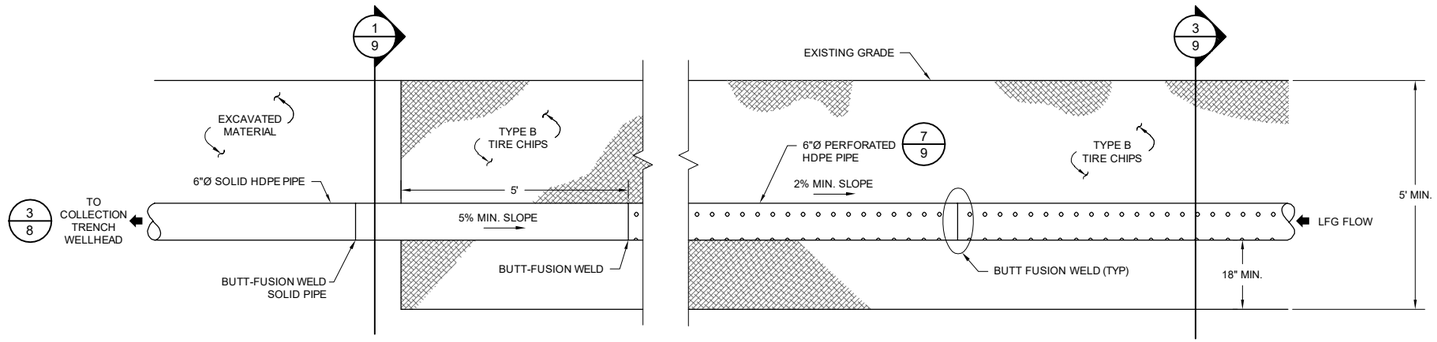
LFG COLLECTION TRENCH

3 — NOT TO SCALE



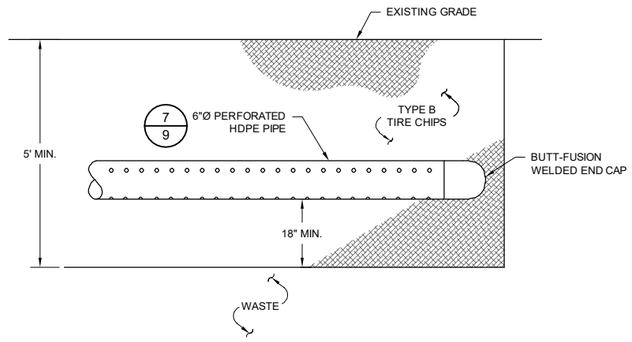
DUAL PIPE LFG COLLECTION TRENCH

4 — NOT TO SCALE



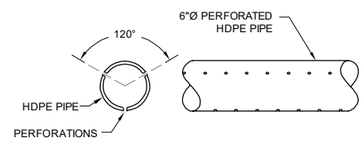
LFG COLLECTION TRENCH TRANSITION

5 — NOT TO SCALE



COLLECTION TRENCH TERMINATION

6 — NOT TO SCALE

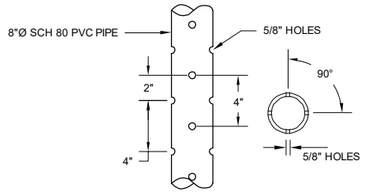


NOTE:

1. HOLES SHALL BE 1/2"Ø DRILLED HOLES SPACED 12" APART ALONG THE LENGTH OF THE PIPE OR APPROVED EQUIVALENT BY OWNER.

PERFORATED HDPE PIPE

7 — NOT TO SCALE — (GAS COLLECTION TRENCHES)

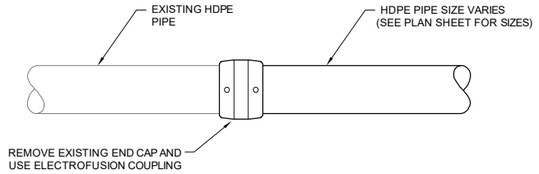


NOTES:

1. PERFORATIONS SPACED 90° APART HORIZONTALLY.
2. PERFORATIONS SPACED 4" APART VERTICALLY.
3. 90° AND 270° ROWS STAGGERED 2" BELOW 0° AND 180° ROWS.

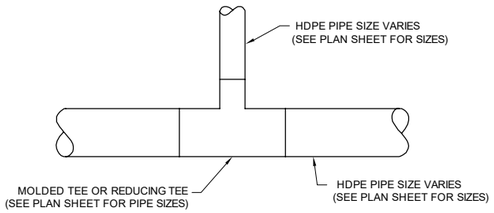
PERFORATED PVC PIPE

8 — NOT TO SCALE — (LFG EXTRACTION WELLS)



CONNECTION TO EXISTING CONVEYANCE PIPE

9 — NOT TO SCALE



PLAN VIEW

"TEE" INSTALLATION

10 — NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE — TIMOTHY W REED — No. 12655 — LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.34

DETAILS

SHEET NUMBER: 9 OF 11

FILE: P:\2500s\2536.34\Graphics\Final\Cell13\Dwg\09-11-Details.dwg
LAYOUT: 9 OF 11
CREATE: Brian.Blanchard
PLOT DATE: 3421

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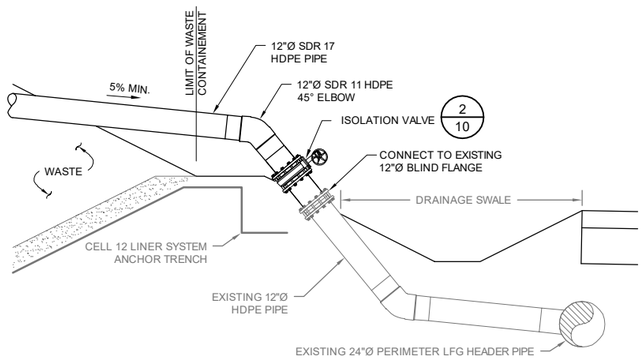
NOTES:

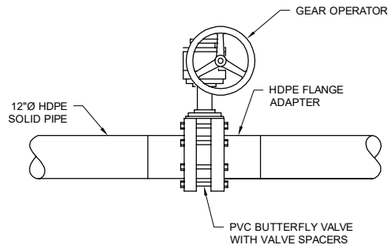
1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.



CONNECTION AT PERIMETER HEADER

1

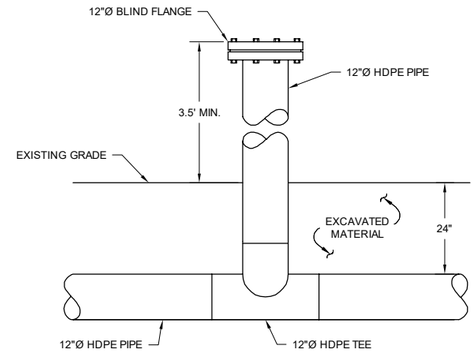
NOT TO SCALE



ISOLATION VALVE

2

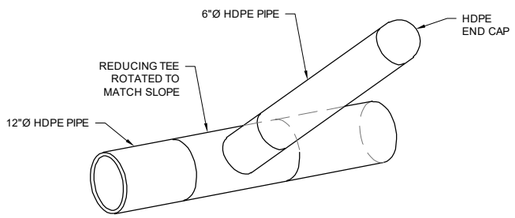
NOT TO SCALE



VERTICAL RISER

3

NOT TO SCALE

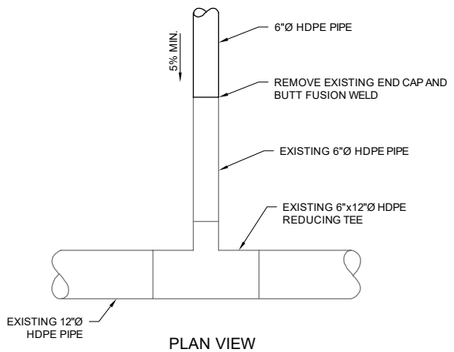


ISOMETRIC VIEW

6"Ø PIPE STUB

4

NOT TO SCALE

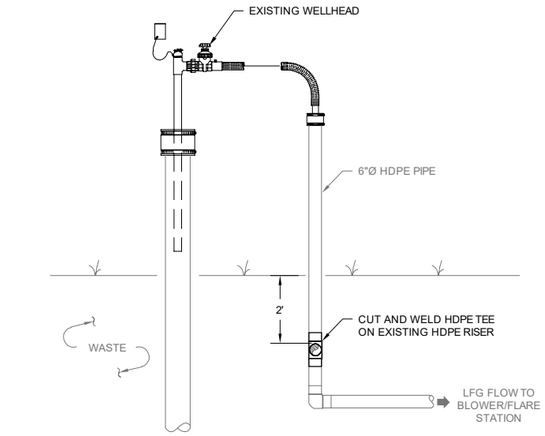


PLAN VIEW

CONNECTION TO EXISTING 6"Ø STUB

5

NOT TO SCALE



CONNECT TO VACUUM SOURCE AT EXISTING LFG WELL

6

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE TIMOTHY W REED 19595 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

DETAILS

PROJECT NUMBER: 2536.34

SHEET NUMBER: 10 OF 11

FILE: P:\2500s\2536.34\Graphics Files\CAD\Cell 13 Drawings\06 - 11 - Details.dwg
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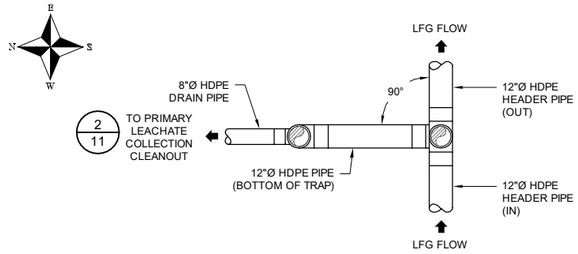
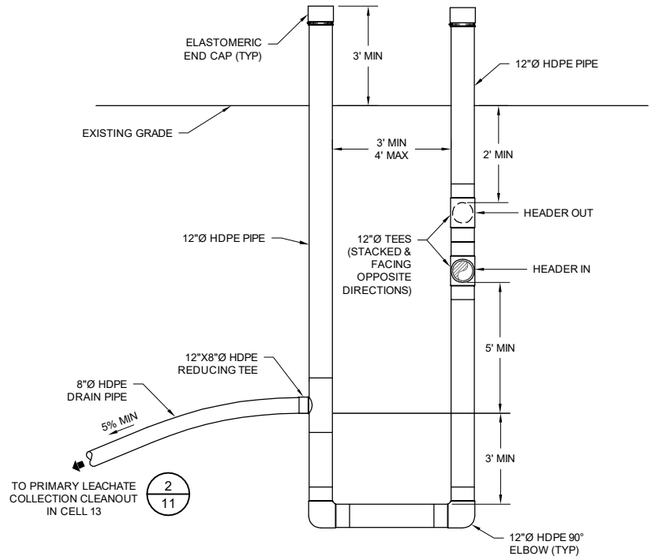


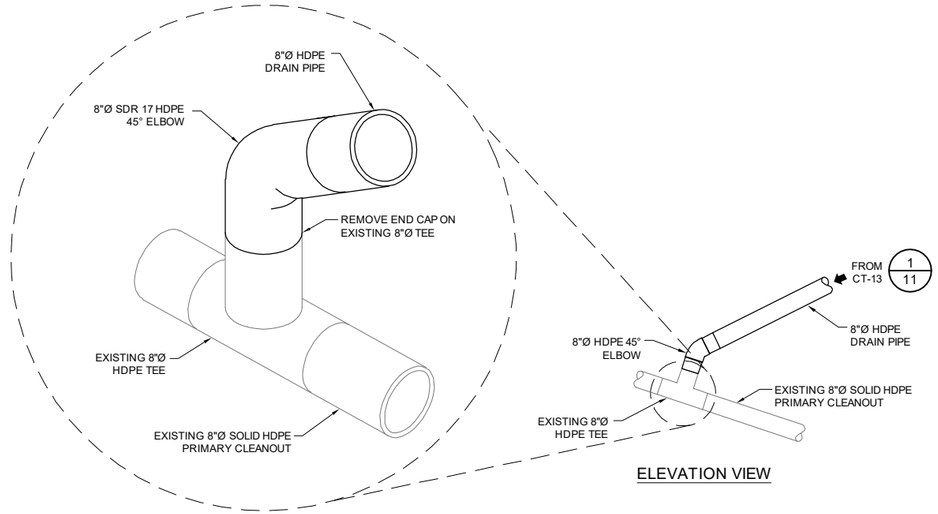
PLAN VIEW



ELEVATION VIEW

1 CONDENSATE TRAP CT-13

NOT TO SCALE



ELEVATION VIEW

2 DRAIN TIE-IN TO CELL 13 PRIMARY LEACHATE COLLECTION CLEANOUT

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE
TIMOTHY
W
REED
12685
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: MARCH 2021

CELL 13 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

DETAILS

PROJECT NUMBER: 2536.34

SHEET NUMBER: 11 OF 11

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CTB FILE: BH-Bwissedo
PLOT DATE: 3/4/21

CELL 14 Development / Landfill Gas System Expansion Drawings

JUNIPER RIDGE LANDFILL
CELL 14 DEVELOPMENT

1.0 CELL 14 SYSTEM OVERVIEW

Cell 14 is approximately 7.6 acres in size and provides approximately 1,076,000 cubic yards of disposal capacity. Cell 14 abuts existing Cell 13, and its liner system will transition and connect to the Cell 13 liner system. The location and base grades for Cell 14 are shown on Figure 14-1. Cell 14 will be constructed and put into operation in 2022.

The Cell 14 liner system will consist of a composite leachate collection and primary liner, a leak detection system, and a secondary liner.

The composite leachate collection and primary liner will consist of the following components:

- A 12-inch layer of sand ($K \geq 5x10^{-3}$ cm/sec);
- A network of 6-inch and 8-inch diameter perforated HDPE pipe;
- A geocomposite drainage net;
- An 80-mil high-density polyethylene (HDPE) textured geomembrane;
- A geosynthetic clay liner (GCL);
- A 12-inch clay barrier soil layer (hydraulic conductivity (K) less than or equal to $1x10^{-7}$ cm/sec); and
- A dedicated leachate collection pump system.

The leak detection system has been designed to detect leaks within 30 days and will consist of the following components:

- A 12-inch layer of sand ($K \geq 5x10^{-3}$ cm/sec);
- A network of 6-inch and 8-inch diameter perforated HDPE pipe;
- A geocomposite drainage net; and
- A dedicated leak detection pump system.

The secondary liner will consist of a 60-mil HDPE textured geomembrane. Directly below the secondary liner system will be 12 inches of clay with a hydraulic conductivity less than or equal to $1x10^{-7}$ cm/sec.

Leachate Collection

The Cell 14 leachate collection system consists of a 12-inch layer of granular material with a hydraulic conductivity greater than 5 $x10^{-3}$ cm/sec, perforated HDPE laterals (minimum diameter 6 inches) and a perimeter transport pipe (minimum diameter 8 inches), stone pipe filters, and a drainage geocomposite. Cleanouts are provided for the Cell 14 leachate laterals and perimeter transport piping. The leachate collection system is a gravity drain system which flows to the Cell 14 collection sump and pump system located at the northeast corner of the Cell. The Cell 14 collection sump area will be connected to the Cell 13 leachate collection piping which also receives leachate from Cell 11 and Cell 12. Leachate that accumulates in the Cell 14 sump will be pumped to the 900,000-gallon above ground storage tank via the existing dual contained force main for temporary storage prior to trucking the leachate off-site for treatment.

The new Cell 14 leachate pump system consists of a new primary 5-horsepower pump, located in the bottom of the sump and accessed through a 24-inch riser pipe, and a new secondary 5-horsepower pump, located in a separate 24-inch riser pipe directly adjacent to the primary 24-inch riser. The primary pump has the ability to pump design flows, while the secondary pump serves as a backup. Both pumps are piped through a header system to the existing dual-containment leachate force main infrastructure in the northeast corner of the permitted expansion area. The pumping calculations are provided in Appendix A-2 of the Cell 14 Design Report.

Leak Detection

The Cell 14 leak detection system consists of a 12-inch layer of granular material with a hydraulic conductivity greater than 5 $x10^{-3}$ cm/sec, perforated HDPE laterals (minimum diameter 6 inches) and a perimeter transport pipe (minimum diameter 6 inches), stone pipe filters, and a drainage geocomposite. Cleanouts are provided for the Cell 14 leak detection laterals and perimeter transport piping. Liquids that collect in the Cell 14 leak detection layer drain to the leak detection sump, located on the northeast side of the cell. The sump has a 0.5 horsepower pump that pumps liquids into the leachate collection sump. The leak detection pump system is equipped with a flow meter and sample port to monitor leak detection flows and water quality. The leak detection system has the hydraulic capacity to transmit the predicted flows associated with the Cell 14 primary liner action leakage rate and rapid and large leakage rate. A small wooden structure is constructed over both the leachate collection and leak detection piping to provide weather protection.

2.0 CELL 14 DEVELOPMENT

Initial conditions prior to waste placement into Cell 14 are shown on Figure 14-1. After the initial placement of approximately 51,500 CY of waste for the 5-foot soft/frost-protection layer within Cell 14, waste placement and operations of Cell 14 will be performed in accordance with the operating procedures contained in Section 7.0 of the JRL Operations Manual. The four (4) stages of waste placement are shown on Figures 14-2 through 14-5. Associated operational details are shown on Figures 14-6, 14-7, and 14-8: final cover termination at top of slopes, final cover system, cover system anchor trench at top of slopes and sideslope perimeter berms, and intermediate berm base liner connection (Figure 14-6); leachate collection inlet, temporary mid-slope intermediate berm, perimeter berm intermediate geomembrane cover, temporary up-slope stormwater diversion berm and the Cell 14 access ramp (Figure 14-7), and downspout section, perimeter berm downspout profile and plunge pool (Figure 14-8). Access to Cell 14 will initially be from the northwest corner of the cell off the existing access ramp. The ramp will be constructed over the perimeter berm as detailed on Figure 14-7.

Portions of Cell 14 waste placement will be intergraded with the northern sideslope of Cell 13. Prior to filling against the northern sideslope of Cell 13, temporary cover materials will be removed to the height of the next waste lift and temporary up-slope stormwater diversion berms will be constructed to divert clean stormwater runoff away from the active operating area as detailed on Figure 14-7. Initial waste placement will be within a two-foot setback from the Cell 14 perimeter berm interior slope to allow the infiltration of stormwater that comes in contact with exposed waste to drain into the perimeter drainage stone or sand. After the intermediate geomembrane cover is installed during the first stage of Cell 14 construction, this area will become a temporary stormwater drainage ditch that will direct stormwater to the perimeter ditches.

Waste placement operations in Cell 14 will progress until Stage 1 grades are achieved as shown on Figure 14-2. Runoff from the intermediate geomembrane covering the sideslopes of Stage 1 will flow via a temporary stormwater ditch constructed along the inside edge of the access ramp to a culvert and stormwater ditch constructed north of Cell 14 adjacent to the gravel maintenance road.

Operational controls and waste filling will progress for Stages 2 and 3 as shown on Figures 14-3 and 14-4, respectively. As the waste elevation approaches the final elevation in each stage, leachate transport piping, leachate collection inlets, landfill gas infrastructure and intermediate geomembrane cover will be installed in preparation for the operation of the next stage. The filling of Stages 2 and 3 will include the construction of the landfill access ramp graded as shown on Figures 14-2 through 14-4. The access ramp is constructed with a 2-foot-high berm on the outside edge and a 2-foot deep stormwater ditch on the inside edge. Stage 4 will be accessed using the newly constructed East Road and filling includes waste placement over the access ramp used to access Stages 1 thru 3 as well as in the adjacent access ramp stormwater ditch. The waste below the landfill access ramp and all berms constructed of waste must be

a high shear strength waste such as construction and demolition debris. High strength waste is defined as waste with adequate strength such that it can be piled while maintaining sideslopes of 1 horizontal to 1 vertical (1H:1V). High strength wastes would not include materials such as sludges or other high moisture content materials.

Upon completion of the cell development stages of Cell 14, intermediate cover will be in place over the entire waste surface of the developed area and maintained until the final cover is constructed over this area.

3.0 LANDFILL GAS INFRASTRUCTURE PLACEMENT

The landfill gas infrastructure will be placed as described in Appendix J of the JRL Operations Manual and as shown on the Landfill Gas Development Plans included in Appendix D of the Design Report.

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

NOTES:

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, AND ACCESS ROADS, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED DECEMBER 1, 2021.
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   VERTICAL DATUM - NAVD 88, US FT.
3. REMAINDER OF BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/24/21. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.
4. WETLAND BOUNDARIES DELINEATED BY WOODLOT ALTERNATIVES, INC. IN 2004 AND STANTEC CONSULTING SERVICES 2008, 2014, AND 2015.
5. BASEGRADES WITHIN CELL 14 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
6. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM.
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

CELL 14 LINED AREA = 7.6 ACRES

25 0 50 100 FEET

FIGURE 14-1
CELL 14 - DEVELOPMENT INITIAL CONDITIONS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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DWG: C14-CELLDEV LMN: INITIAL CTB: SME-STD REV: 1/20/2022

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LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

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8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

ESTIMATED STAGE 1
CAPACITY = 281,000 CY
INCLUDING SOFT LAYER
VOLUME =51,500 CY

25 0 50 100 FEET

FIGURE 14-2
CELL 14 - DEVELOPMENT - STAGE 1
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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DETENTION POND 11

STORMWATER CATCH BASINS AND OUTLET PIPES

EXISTING CELL 14 PUMP STATION

CLEAN STORMWATER FLOW (TYP)

6"/10" LEACHATE FORCE MAIN

24" DIA LANDFILL GAS HEADER PIPE (TYP)

PERIMETER ACCESS ROAD (TYP)

UNDERGROUND ELECTRIC

EXISTING CELL 13 PUMP STATION

EXISTING CELL 12 PUMP STATION

CELL 14 LINER LIMIT (TYP)

CELL 14 GRAVEL MAINTENANCE ROAD (TYP)

CELL 14 ACCESS RAMP SEE FIGURE 14-7

36" DIA HDPE SMOOTH INTERIOR CULVERT INV IN 198.5 INV OUT 197.0

18" DIA CULVERT INV IN 199.0 INV OUT 198.5

CELL 14 ACCESS (TYP)

CELL 14 LINER LIMIT (TYP)

CELL 13/14 LINER LIMIT (TYP)

2.5%

LEACHATE COLLECTION PIPING

LEACHATE COLLECTION INLET SEE FIGURE 14-7

CELL 13 OPERATIONAL WASTE GRADES (TYP)

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

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ESTIMATED STAGE 2
CAPACITY = 330,000 CY

25 0 50 100 FEET

FIGURE 14-3
CELL 14 - DEVELOPMENT - STAGE 2
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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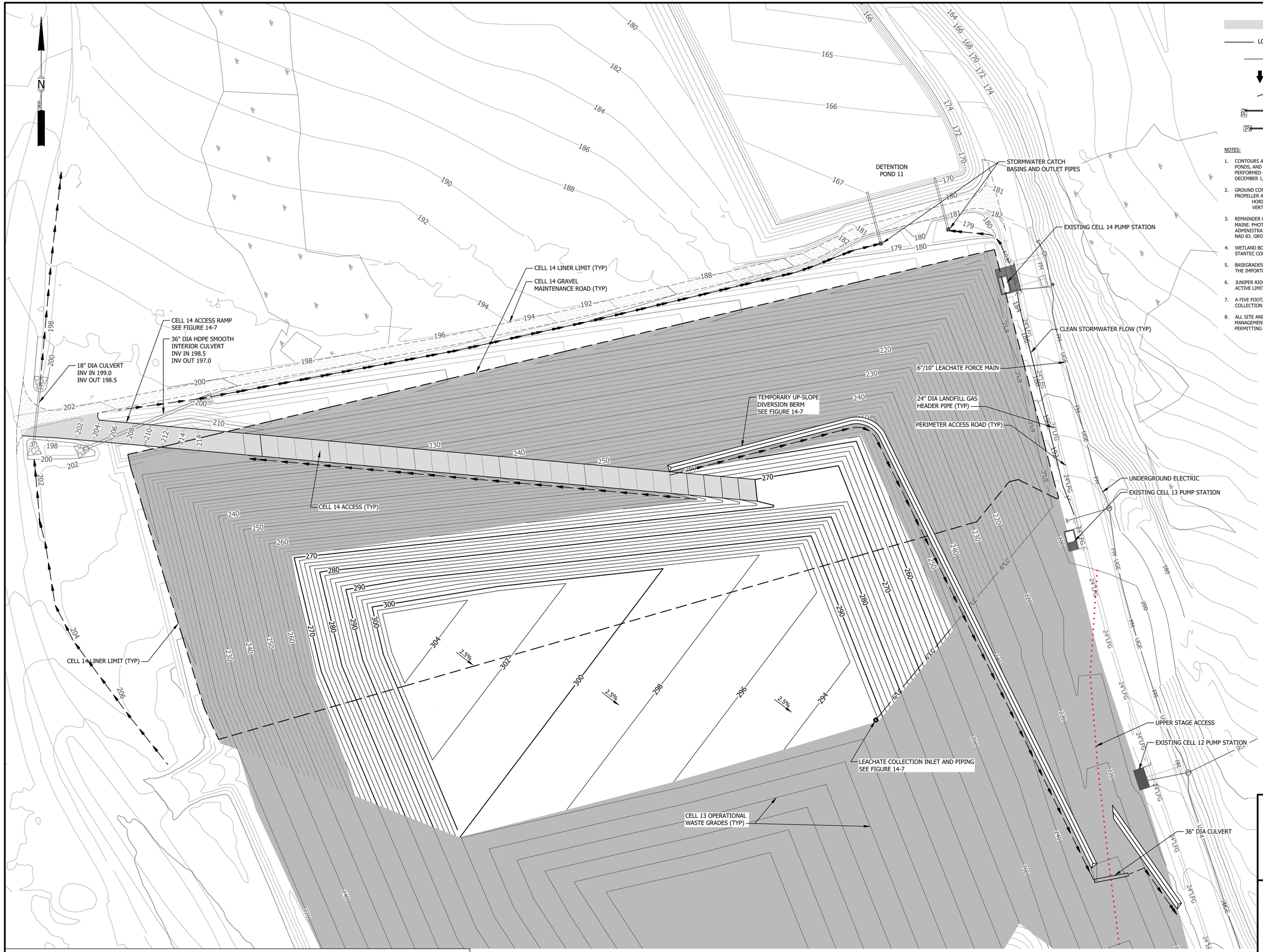

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

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ESTIMATED STAGE 3
CAPACITY = 248,000 CY

25 0 50 100 FEET

FIGURE 14-4
CELL 14 - DEVELOPMENT - STAGE 3
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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GRID

DETENTION POND 11

STORMWATER CATCH BASINS AND OUTLET PIPES

EXISTING CELL 14 PUMP STATION

CELL 14 LINER LIMIT (TYP)

6"/10" LEACHATE FORCE MAIN

TEMPORARY UP-SLOPE DIVERSION BERM SEE FIGURE 14-7

24" DIA LANDFILL GAS HEADER PIPE (TYP)

PERIMETER ACCESS ROAD (TYP)

UNDERGROUND ELECTRIC

EXISTING CELL 13 PUMP STATION

CELL 14 LINER LIMIT (TYP)

CELL 13 ACCESS RAMP

UPPER STAGE ACCESS

EXISTING CELL 12 PUMP STATION

CELL 13 OPERATIONAL WASTE GRADES (TYP)

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

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ESTIMATED STAGE 4
CAPACITY = 214,000 CY

25 0 50 100 FEET

FIGURE 14-5
CELL 14 - DEVELOPMENT - STAGE 4
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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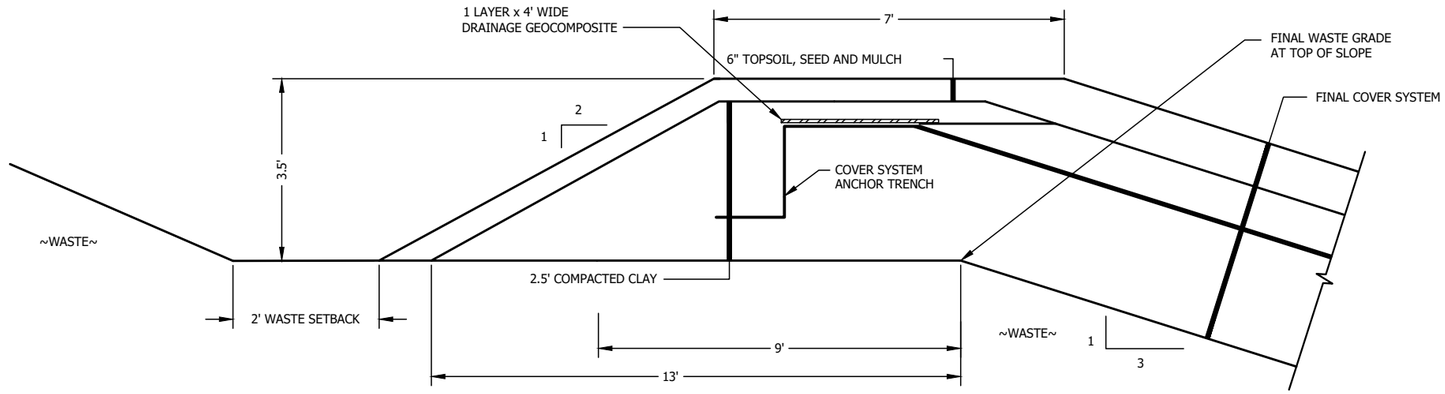
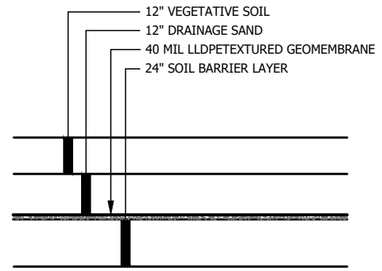


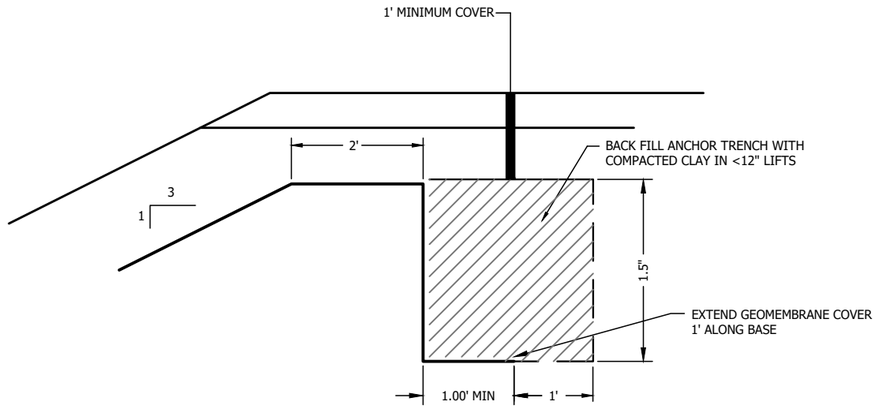
FINAL COVER TERMINATION AT TOP OF SLOPES (TYP)

NTS



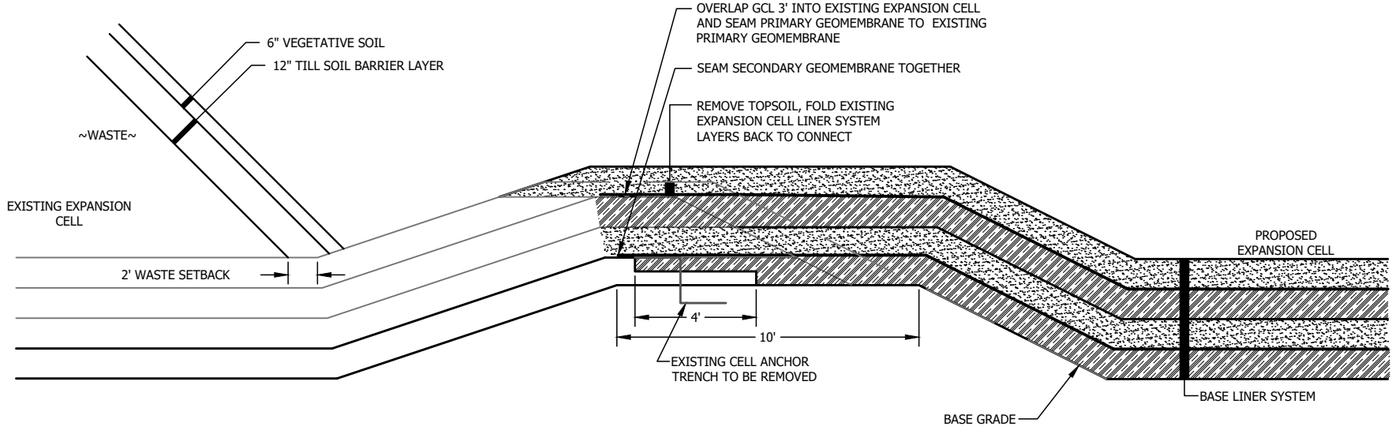
FINAL COVER SYSTEM

NTS



COVER SYSTEM ANCHOR TRENCH AT TOP OF SLOPES AND SIDESLOPE PERIMETER BERMS (TYP)

NTS



INTERMEDIATE BERM BASE LINER CONNECTION

NTS

FIGURE 14-6
TYPICAL DEVELOPMENT DETAILS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

SME
SEVEE & MAHER
ENGINEERS

DWG: C14-CELLDEV-DETAILS LMN: NONE CTB: SME-STD REV: 1/17/2022

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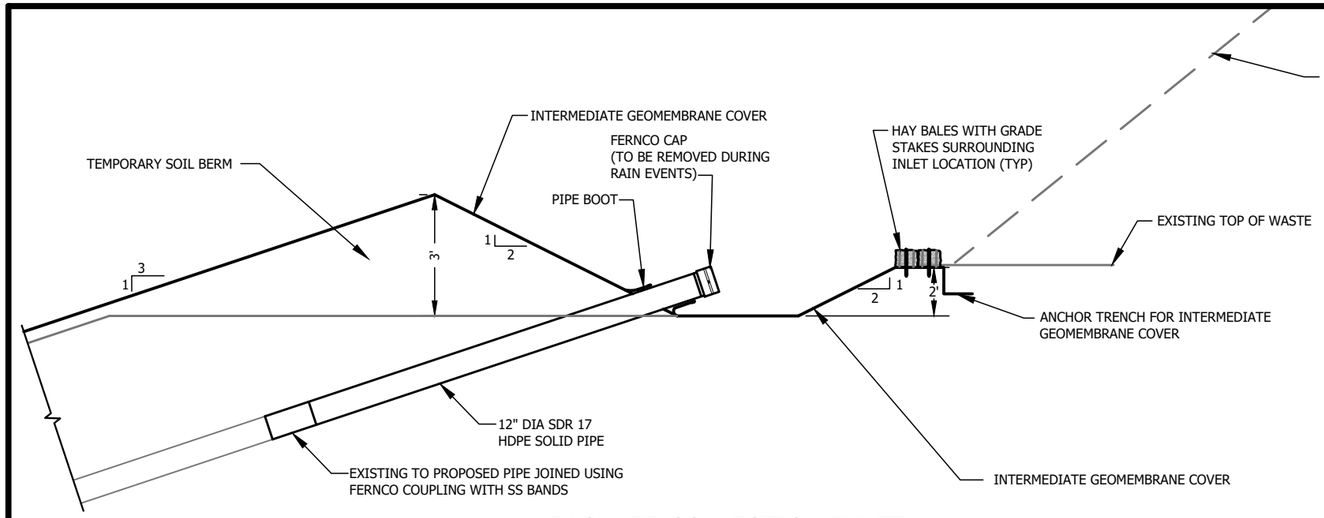
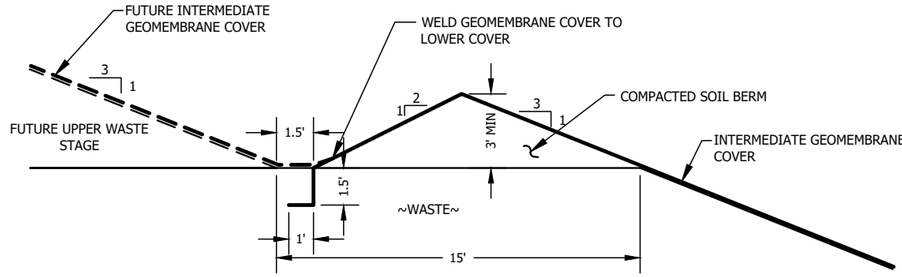
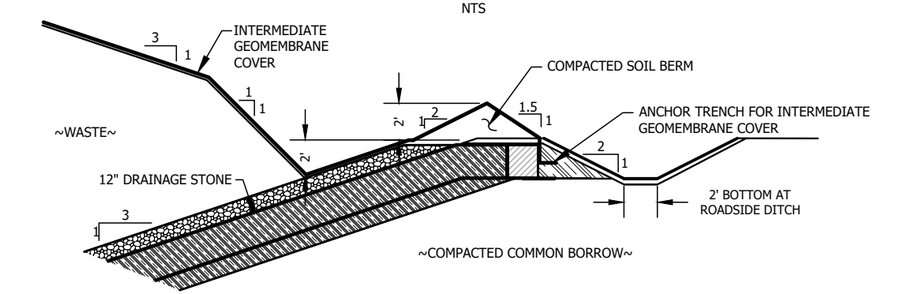


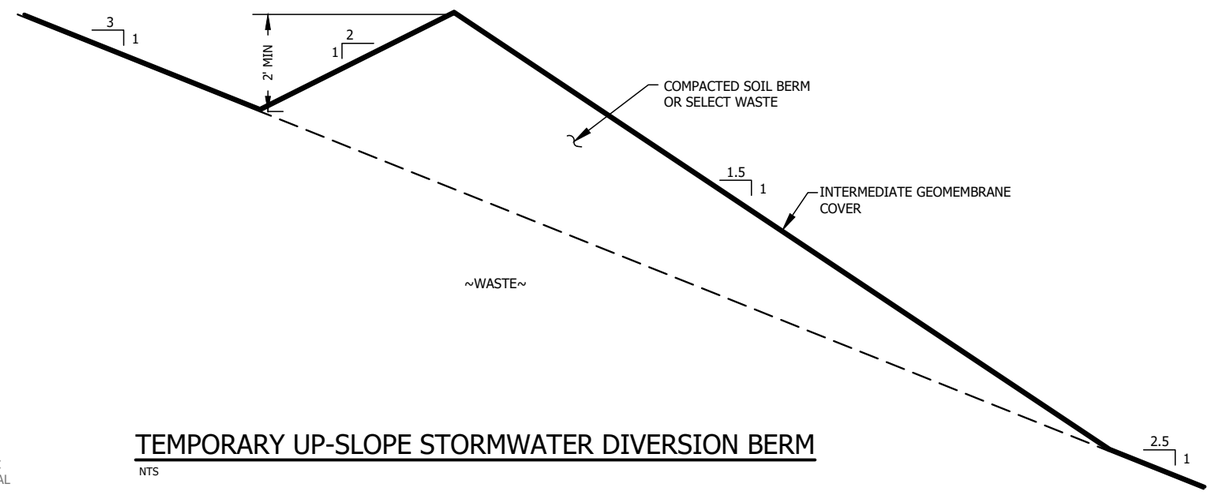
LEACHATE COLLECTION INLET
NTS



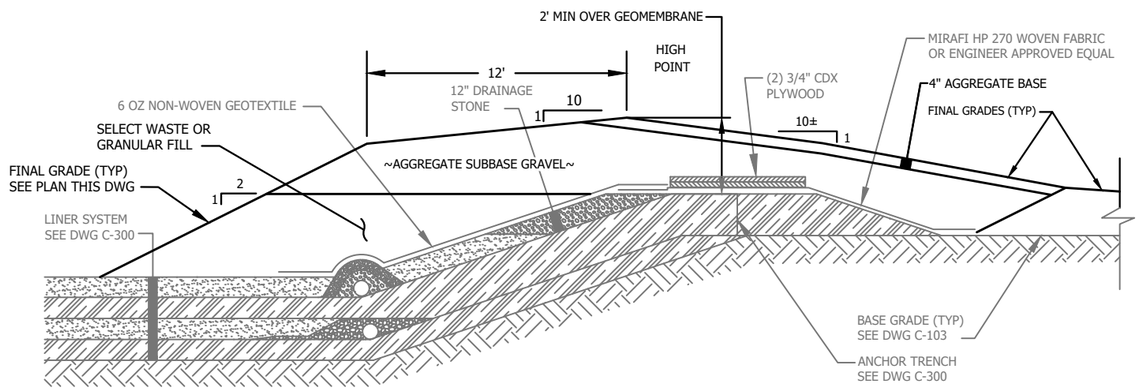
TEMPORARY MID-SLOPE INTERMEDIATE BERM
NTS



PERIMETER BERM INTERMEDIATE GEOMEMBRANE COVER DETAIL
NTS



TEMPORARY UP-SLOPE STORMWATER DIVERSION BERM
NTS



CELL 14 ACCESS RAMP
NTS

FIGURE 14-7
TYPICAL DEVELOPMENT DETAILS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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ENGINEERS

DWG: C14-CELLDEV-DETAILS LMN: NONE CTB: SME-STD REV: 1/17/2022

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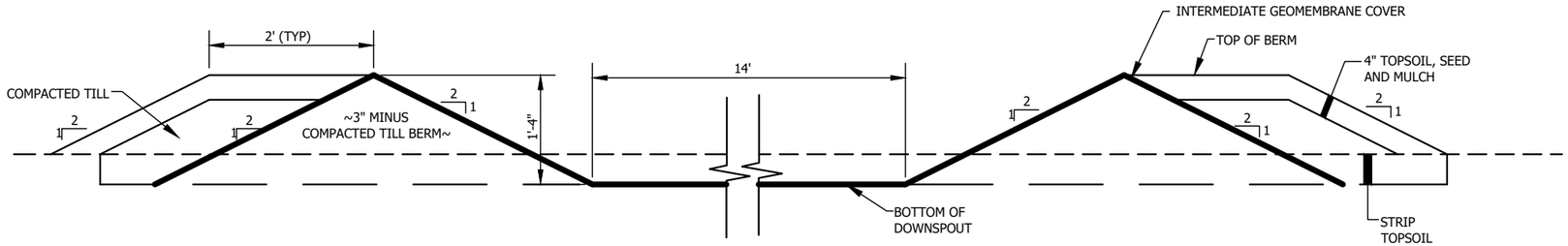
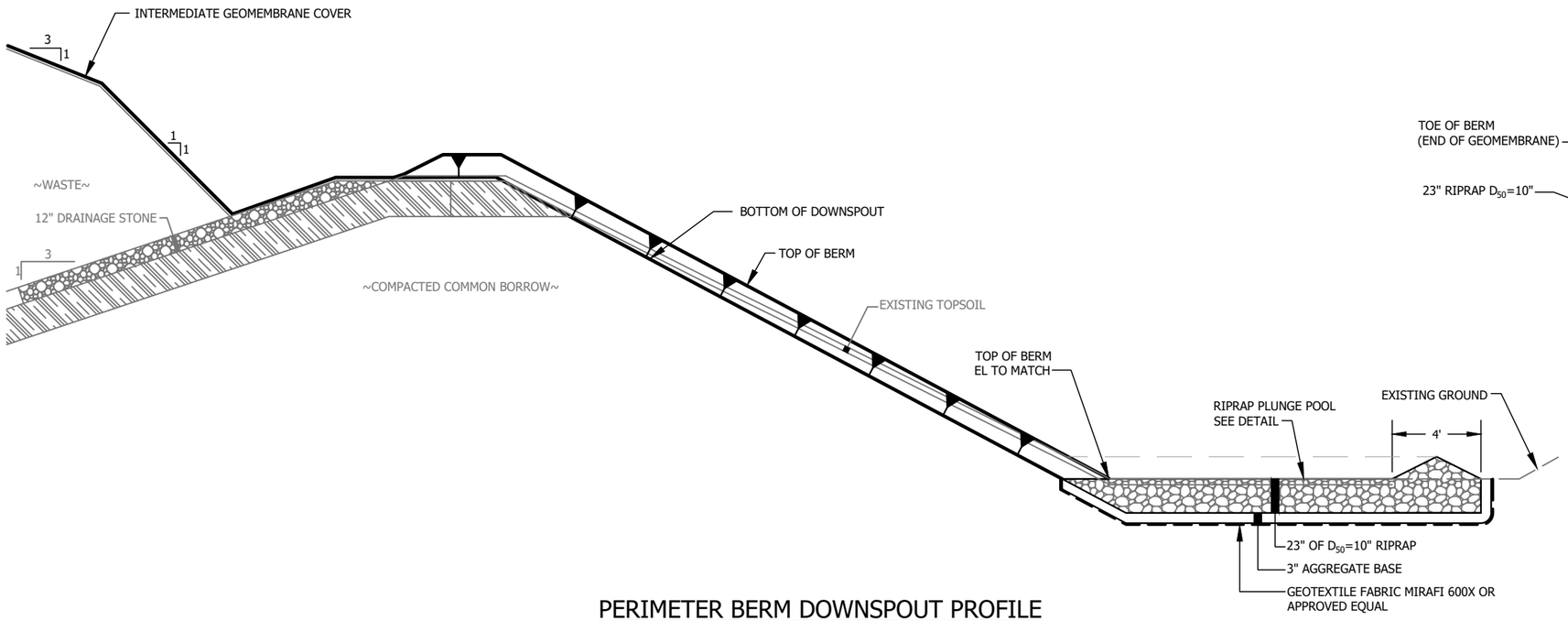
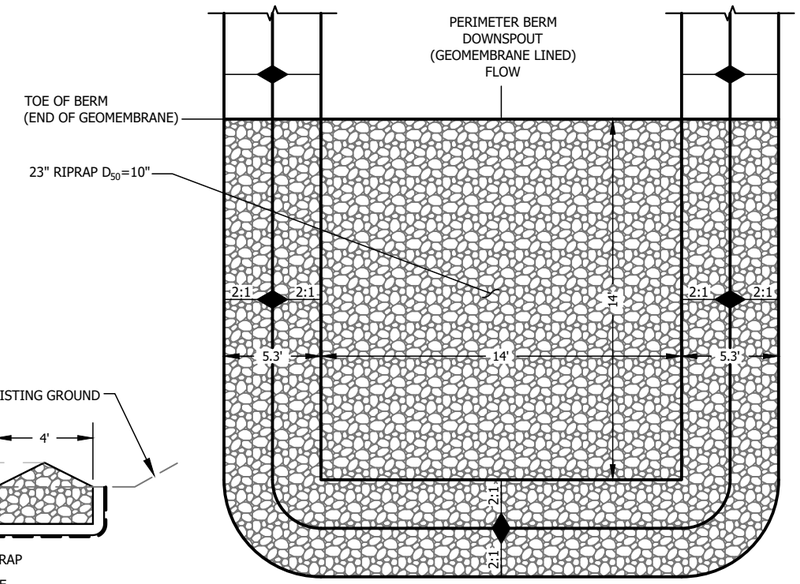


DOWNSPOUT SECTION
NTS



PERIMETER BERM DOWNSPOUT PROFILE
NTS



PLUNGE POOL
NTS

FIGURE 14-8
TYPICAL DEVELOPMENT DETAILS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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DWG: C14-CELLDEV-DETAILS LMN: NONE CTB: SME-STD REV: 1/17/2022

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SEVEE & MAHER ENGINEERS
4 Blanchard Road, P.O. Box 85A
Cumberland, ME 04021
Tel: 207.829.5016 / Fax: 207.829.5692
smemaine.com

MANHOLE ANTI FLOTATION DESIGN

Project Name: Juniper Ridge Landfill Cell 14
Project Location: Old Town, Maine
Project No.: 21781
By: DPW
Date: 12/17/2021
Checked By: RNF
Date: 12/31/2021

OBJECTIVE

Design

REFERENCES

1. Maine Department of Environmental Protection, Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices, October 2016.

2. Applied Microcomputer Systems, HydroCAD Stormwater Modeling System,Version 7.0, Chocorua, New Hampshire, 2001.

ANALYSIS

1. Design

CONCLUSION

Outlet Structure	25-YR EL (ft)	INV OUT (ft)	BARREL TOP (ft)	HYDRAULIC DIFF (ft)
DP-11	167.89	164.3	168.4	4.1

<u>Step 1:</u> Calculate uplift on structure.

Calculate Weight of Water Displaced

Difference=	4.1	ft
Sump Depth=	0.3	ft
Thickness of Structure Bottom=	6	in
Thickness of Concrete Fill=	6	in
Total Depth=	5.4	ft
Unit Weight of Concrete=	62.4	lb/ft^3
Unit Weight of Water=	150	lb/ft^3
Pressure at Total Depth=	337	lb/ft^2
Manhole Outer Diameter=	4.83	ft
Pi=	3.1416	
Manhole Outer Area=	18.32	ft^2
Total Uplift Pressure=	*Pressure at Total Depth x* $A_{manhole}$	
Total Uplift Pressure=	6174	lb

<u>Step 2:</u> Determine Weight of Structre without concrete footing:

Frame and Grate Weight=	0	lb
Cover Thickness=	0	in
Cover Weight=	0	lb
Concrete Bottom Weight=	2748	lb
Concrete Barrel Weight=	863	lb/vft
Barrel Top Elevation=	168.4	ft
Barrel Bottom Elevation=	164	ft
Difference=	4.4	ft
Weight of Barrels=	3799	lb
Manhole Inner Diameter=	4	ft
Pi=	3.1416	
Manhole Inner Area=	12.57	ft^2
Volume Displace in Sump=	3.77	ft^3
Weight of Water in Sump=	235	lb
Total Structure Weight=	6783	lb
Weight Differential=	609	lb

<u>Step 3:</u> Determine desired Factor of Safety:

Factor of Safety=		
Factor of Safety=	1.10	Desired Factor of Safety is 1.1. No concrete fill required.

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STANDARD LEVEL SPREADER DESIGN

Project Name: Juniper Ridge Landfill Cell 14
Project Location: Old Town, Maine
Project No.: 21781
By: DPW
Date: 12/17/2021
Checked By: RNF
Date: 12/31/2021

OBJECTIVE

Design level spreaders in accordance with Erosion and Sediment Control Standards.

REFERENCES

1. Maine Department of Environmental Protection, Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices, October 2016.
2. Applied Microcomputer Systems, HydroCAD Stormwater Modeling System,Version 7.0, Chocorua, New Hampshire, 2001.

ANALYSIS

1. Level Spreader Length shall be such that flow from the spreader during the 10-year storm event does not exceed 0.25 cfs per linear foot of spreader. (Minimum Length= 15')

CONCLUSION

Level Spreader Designation	Discharge From	Q_{10} (cfs)	Rqd Rate (cfs/ft)	Min. Rqd. Length (ft)	Specified Length (ft)
11	Pond DP-11	1.7	0.25	6.8	15

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PLUNGE POOL DESIGN

Project Name: Juniper Ridge Landfill Cell 13
Project Location: Old Town, Maine
Project No.: 21781
By: DPW
Date: 12/16/2021
Checked By: RNF
Date: 12/31/2021

OBJECTIVE

Design plunge pool to protect the outlet of culverts from scour and deterioration.

REFERENCES

1. Maine Department of Environmental Protection, Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices, October 2016.
2. Applied Microcomputer Systems, HydroCAD Stormwater Modeling System,Version 7.0, Chocorua, New Hampshire, 2001.

ANALYSIS

Use design flows for 25-year, 24-hour storm event for permanent culverts and use flows for 10-year, 24-hour storm event for temporary culverts and attached Outlet Protection table to determine apron dimensions and riprap size.

CONCLUSION

Riprap

Plunge Pool Designation	Flow From	Q_{25} (cfs)	Culvert Dia. (in)	D_{50} (in)	Thickness (in)	Length (ft)	Width (ft)
DP-11	Pond DP-11	2	18	8	18	6	6
CB4G	Culvert 4G	52	24	10	23	20	20
CB4H	Culvert 4H	17	24	10	23	10	10

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RIPRAP APRON DESIGN

Project Name: Juniper Ridge Landfill Cell 13
Project Location: Old Town, Maine
Project No.: 21781.03
By: DPW
Date: 12/17/2021
Checked By: RNF
Date: 12/31/2021

OBJECTIVE

Design culvert outlet protection to protect the outlet of culverts from scour and deterioration.

REFERENCES

1. Maine Department of Environmental Protection, Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices, October 2016.
2. Applied Microcomputer Systems, HydroCAD Stormwater Modeling System, Version 10.10-4a, Chocorua, New Hampshire.

ANALYSIS

1. Design flows for 25-year, 24-hour storm event used for permanent culverts.
2. Design flows for 10-year, 24-hour storm event used for temporary culverts.
3. See attached outlet protection table to determine apron dimensions and riprap size.

CONCLUSION

Riprap Apron Designation	Flow From	Q_{25} (cfs)	Culvert Dia. (in)	D_{50} (in)	Thickness (in)	Min. Length (ft)	Width (ft)
T-11a	Culvert C-11a	42	36	14	32	20	9
T-11a2	Culvert C-11a2	19	24	10	23	18	6

* Outlet protection for temporary culvert C-11f designed based on 10-year storm event.

North American Green
5401 St. Wendel-Cynthiana Rd.
Poseyville, Indiana 47633
Tel. 800.772.2040
>Fax 812.867.0247
www.nagreen.com
ECMDS v7.0

CHANNEL ANALYSIS

> > > R-11a-1

Name	R-11a-1
Discharge	36.64
Channel Slope	0.0289
Channel Bottom Width	2
Left Side Slope	2
Right Side Slope	3
Low Flow Liner	
Retardence Class	C 6-12 in
Vegetation Type	None
Vegetation Density	None
Soil Type	Silt Loam (SM)

SC150

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
SC150 Unvegetated	Straight	36.64 cfs	8.22 ft/s	0.99 ft	0.022	2 lbs/ft2	1.79 lbs/ft2	1.12	STABLE	D
Underlying Substrate	Straight	36.64 cfs	8.22 ft/s	0.99 ft	0.022	1.47 lbs/ft2	1.09 lbs/ft2	1.34	STABLE	D

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>Fax 812.867.0247
www.nagreen.com
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CHANNEL ANALYSIS

> > > R-11a-1

Name	R-11a-1
Discharge	50.49
Channel Slope	0.0289
Channel Bottom Width	2
Left Side Slope	2
Right Side Slope	3
Low Flow Liner	
Retardence Class	C 6-12 in
Vegetation Type	None
Vegetation Density	None
Soil Type	Silt Loam (SM)

C125

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
C125 Unvegetated	Straight	50.49 cfs	8.93 ft/s	1.16 ft	0.022	2.3 lbs/ft2	2.08 lbs/ft2	1.1	STABLE	D
Underlying Substrate	Straight	50.49 cfs	8.93 ft/s	1.16 ft	0.022	1.68 lbs/ft2	1.24 lbs/ft2	1.36	STABLE	D

APPENDIX D

LANDFILL GAS DEVELOPMENT PLANS

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SANBORN HEAD

Building Trust. Engineering Success.

Technical Specifications
Cell 14 Landfill Gas System Expansion
Juniper Ridge Landfill
Old Town, Maine

Prepared for
NEWSME Landfill Operations, LLC
Old Town, Maine

Prepared by
Sanborn, Head & Associates, Inc.
20 Foundry Street
Concord, New Hampshire

File 2536.34
January 2022

CONTENTS

DIVISION 2 - SITE WORK

Section 02560 - Landfill Gas Extraction Wells
Section 02565 - Landfill Gas Trenches

SECTION 02560

LANDFILL GAS EXTRACTION WELLS

PART 1 - GENERAL

1.1 SCOPE OF APPLICATION

A. Supply all equipment, materials, and labor needed to install landfill gas extraction wells as specified herein and as indicated on the Drawings.

1.2 SUBMITTALS

A. Submit to ENGINEER Certificates of Compliance on materials furnished, and manufacturer's brochures containing complete information and instructions pertaining to the storage, handling, installation, and inspection of pipe and appurtenances furnished.

B. Submit to ENGINEER well logs within 7 days of the completion of well installations.

C. The well logs shall depict a construction diagram for each well drilled, including the total depth of the well, the temperature of spoils, depth, thickness, and description of soil or waste strata, and the occurrence of any water bearing zones.

1.3 SITE CONDITIONS

A. Obstructions and saturated conditions such as sludges, and foundry sands are sometimes encountered when drilling in landfills, many of which can be drilled through. CONTRACTOR is expected to make reasonable effort to drill through obstructions and saturated conditions and will be paid for offset redrilling and boring abandonment only with prior written approval from OWNER.

B. Well drilling shall be performed on a level surface. CONTRACTOR shall provide a level surface at each drilling location as required. The size of the level area shall be acceptable to the drilling subcontractor. Any soil placed to level the drilling location shall be removed following well installation. If soil placed for leveling contacts refuse, it shall be disposed of in the active area of the landfill.

PART 2 - PRODUCTS

2.1 BALLAST STONE

A. Ballast Stone shall be hard, durable, and resistant to weathering and to water action, free from overburden, spoil, and organic materials. Ballast Stone shall

be washed, and uniformly blended according to the particle size distribution requirements shown below.

Sieve Size	Percent Passing by Weight
2-inch	100
1½-inch	90 - 100
1-inch	30 - 40
¾-inch	10 - 15
½-inch	0 - 5
⅜-inch	0 - 5

2.2 BENTONITE SEAL

A. Bentonite Seal shall be constructed using hydrated bentonite chips or pellets.

2.3 SAND/GRAVEL FILTER

A. Sand/Gravel Filter should conform to the following particle size distribution.

Sieve Size	Percent Passing by Weight
1½-inch	100
No. 4	70 - 100
No. 40	30 - 80
No. 200	0 - 15

2.4 COMMON FILL

A. Common Fill should be soil containing no stone larger than 4 inches, and shall have a maximum of 75 percent passing the No. 40 sieve and a minimum of 35 percent passing the No. 200 sieve.

2.5 PVC PIPE

A. Refer to Specification Section 15212.

2.6 WELLHEAD

A. Wellheads should be nominal 2-inch size QED Quick Change Orifice Plate wellhead, with elastomer adapter kits, or equivalent approved by OWNER. The wellhead components are indicated on the Drawings.

B. Wellhead and flow measurement tube shall be compatible with the CES/LANDTEC GEM-2000™ and GEM-5000™ Landfill Gas Monitors.

PART 3 - EXECUTION

3.1 DRILLING

A. ENGINEER shall observe all drilling operations.

B. Wells shall be drilled to the minimum diameter and the specific depths shown on the Drawings. CONTRACTOR shall drill the wells using bucket-type augers and dry drilling equipment; wet rotary drilling equipment may not be used.

C. Well depths shown on the Drawings are estimated based on projected top of waste elevations and may be adjusted in the field by ENGINEER. At no time shall the drilling extend deeper than the bottom of well screen elevation.

D. If water is encountered in a borehole, then CONTRACTOR may be directed to drill beyond the point that it was encountered. If wet conditions remain, then drilling may be terminated and the length of perforated pipe adjusted by ENGINEER, or the well may be relocated. If wet conditions cease (e.g., due to trapped water layer), then drilling will continue to the design depth.

E. As soon as drilling is completed, a safety screen shall be placed over the top of the borehole. This screen shall stay in place until backfilling is within 4 feet of the surface. Safety screen size should be large enough to accommodate all backfill materials and any tools used during backfill yet not large enough for any human to accidentally fall through.

F. Wells shall be drilled straight and plumb and the well pipe shall be installed in the center of the borehole. CONTRACTOR will take all compression off of the pipe by mechanical means and center the pipe in the middle of the borehole before starting to backfill.

G. PVC well pipe shall be solvent cemented and mechanically fastened with stainless steel fasteners.

3.2 BACKFILLING

A. Backfilling the borehole shall commence immediately after drilling is completed and the PVC pipe has been installed. Backfill materials shall be installed as indicated on the Drawings and as approved by ENGINEER.

B. Ballast Stone shall be poured or scooped through the safety screen at a rate that will not endanger the integrity of the well casing and limits the potential for bridging.

C. The Sand/Gravel Filter shall be poured through the safety screen until a layer at least 1-foot thick above the Ballast Stone is formed.

D. The Bentonite Seal will be formed by evenly distributing bentonite around the annulus of the well until a minimum plug thickness of 1 foot has been achieved.

E. Common Fill shall be rodded in the boring to provide even distribution and compaction.

3.3 DISPOSAL

A. Refuse from well drilling operations shall be hauled to the active face of the landfill operation the same day it is excavated.

[END OF SECTION 02560]

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SECTION 02565

LANDFILL GAS TRENCHES

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. CONTRACTOR shall provide all labor, materials, equipment, and incidentals necessary to excavate and backfill trenches for the landfill gas management system as shown on the Drawings and specified herein, including, but not limited to: excavation of waste; placement of soil, aggregate, and pipe; compaction of soil; and grading.

PART 2 – PRODUCTS

2.1 GENERAL

A. All soil, unless otherwise specified, shall consist of clean soil substantially free from organic materials, wood, trash, and other objectionable materials that may be compressible or that cannot be properly compacted. Soil shall not contain stone blocks, broken concrete, masonry rubble, or other similar materials. Soil shall have physical properties such that it can be readily spread and compacted to the specified density. Snow, ice, and frozen soil shall not be permitted.

B. Unless otherwise specified, the maximum soil particle size shall be no larger than two-thirds the loose lift thickness.

2.2 MATERIALS

A. Tire Chips shall be provided by the OWNER and shall be placed in accordance with ASTM D6270.

B. HDPE pipe and fittings refer to Specification Section 15210.

PART 3 - EXECUTION

3.1 GENERAL EXCAVATION BELOW GRADE

A. CONTRACTOR shall plan and perform earthwork activities to prevent damage to existing structures, safeguard people and property, minimize disruptions to site traffic, protect the structures to be installed, and provide safe working conditions in compliance with local safety regulations and provisions of the Occupational Safety and Health Act (OSHA).

B. Excavation shall be made to the elevations and dimensions shown on the Drawings. Excavate sufficient material to provide suitable room for construction providing bracing and support as required.

3.2 EXCAVATION IN WASTE

A. CONTRACTOR shall take safety precautions during construction activities that conform to all OSHA regulations and the safety requirements of OWNER and the Specifications.

B. Trenches shall be excavated to the depths, widths, and alignments shown on the Drawings.

C. CONTRACTOR shall separate cover soil from excavated refuse to the extent possible. Cover soil may be used to backfill trenches. Excavated material not suitable for use as soil shall be transported to the working face as directed by OWNER.

D. Pockets of perched leachate may be encountered during waste excavation activities. CONTRACTOR shall immediately notify OWNER and ENGINEER when leachate is encountered. ENGINEER will provide CONTRACTOR with directions on how to manage the leachate in narrative and/or drawing form. Potential leachate management techniques may include one or a combination of the following.
   1. Backfilling the affected area.
   2. Realigning the trench.
   3. Installing a French drain.

E. To the extent possible, the trench invert shall slope uniformly as indicated on the Drawings.

F. CONTRACTOR shall not excavate more trench than can be backfilled in one day after placement of the pipe. Excavations shall not be left open overnight.

3.3 BACKFILL

A. Excavated material shall be placed in loose layers and compacted to the extent possible with the goal of establishing a firm, even surface. The loose lift thickness shall not exceed 12 inches.

B. ENGINEER does not have to be present, and does not supervise or direct the actual Work by CONTRACTOR, his/her employees, or agents. Neither the presence of ENGINEER nor any observations and testing performed by ENGINEER shall excuse CONTRACTOR from defects discovered in their Work.

[END OF SECTION 02565]

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CONTENTS

DIVISION 15 - MECHANICAL

Section 15210 – High-Density Polyethylene Pipe (HDPE), Fittings, and Appurtenances

Section 15212 - Polyvinyl Chloride (PVC) Pipe and Fittings

SECTION 15210

HIGH DENSITY POLYETHYLENE (HDPE) PIPE, FITTINGS, AND APPURTENANCES

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Furnish and install HDPE pipe and fittings for the landfill gas extraction system.

B. Pressure test HDPE pipe.

1.2 DELIVERY, STORAGE, AND HANDLING

A. The pipe and fitting manufacturer shall package products for shipment in a manner suitable for safe transport by commercial carrier. When delivered, CONTRACTOR shall inspect the shipment and report any damage to the pipe and fittings manufacturer. Pipe and fittings shall be handled, installed, and tested in accordance with manufacturer's recommendations, and the requirements of this Section.

B. Pipe Storage:
   1. Store or stack pipe to prevent damage from marring, crushing or puncture. Limit maximum stacking height to 6 feet or manufacturer's recommended maximum height, whichever is less.
   2. Store in accordance with manufacturer's recommendations.

C. Pipe Handling:

   1. Protect pipe from excessive heat or harmful chemicals.
   2. Handle pipe and use equipment needed to avoid gouging of the pipe surfaces.

PART 2 - PRODUCTS

2.1 PHYSICAL PROPERTIES:

A. Materials used for the manufacture of PE pipe and fittings shall meet the following physical property requirements:

Property	Unit	Test Procedure	Value
Material Designation	-	PPI/ASTM	-
PPI Material Listing	-	PPI TR-4	PE 4710
Cell Classification	-	ASTM D3350	445474C
Density	g/cm3	ASTM D1505	>0.941
Melt Index [E]	g/10 min	ASTM D1238	<0.15
Flexural Modulus	psi	ASTM D790	110,000 and <160,000
Tensile Strength	psi	ASTM D638	3000 to 3500
PENT	hours	ASTM F1473	>100
HDB	psi	ASTM D2837	1600 at 23^{0} C
UV Stabilizer [C]	% Carbon Black	ASTM D1603	2 to 3
Elastic Modulus	psi	ASTM D638	110,000
Brittleness Temperature	^{o}F	ASTM D746	<-180
Vicat Softening Temperature	^{o}F	ASTM D1525	255
Thermal Expansion	in/in/ ^{o}F	ASTM D696	8 x 10E-5
Hardness	Shore D	ASTM D2240	64
Molecular Weight Category	-	-	Extra High

B. There shall be no evidence of splitting, cracking, or breaking when the pipe is tested.

C. Ring Stiffness Constant (RSC) values for the pipe shall be 90 percent of the nominal.

D. The pipe and fittings shall be homogenous throughout and free from visible cracks, holes, foreign inclusions, or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density, and other physical properties.

E. Clean rework or recycled material generated by the manufacturer's own production may be used so long as the pipe or fittings produced meet all the requirements of this Section.

2.2 PIPE AND FITTINGS

A. Dimensions:
   1. Pipe Dimensions: The nominal inside diameter of the pipe shall be true to the specified pipe size in accordance with ASTM D2513. Standard laying lengths shall be 40 feet $\pm$ 2 inches.
   2. Fitting Dimensions: Fittings such as couplings, wyes, tees, adaptors, etc. for use in laying pipe shall have standard dimensions that conform to ASTM D3261.
   3. Pipe shall be SDR-17. Fitting shall be SDR-11 or SDR-17.

B. Pipe and fittings shall be produced from identical materials meeting the requirements of this Section. Special or custom fittings may be exempted from this requirement.

C. Pipe and fittings shall be pressure rated to meet the service pressure requirements specified. Fittings shall be fully pressure rated to at least the same service pressure rating as the joining pipe.

D. Molded fittings shall meet the requirements of ASTM D3261 and this Section. At the point of fusion, the outside diameter and minimum wall thickness of fitting butt fusion outlets shall meet the diameter and wall thickness specifications of the mating system pipe. Fitting markings shall include a production code that identifies the location and date of manufacture. Upon request, the manufacturer shall provide an explanation of his production code.

E. Marking:
   1. Each standard and random length of pipe and fitting shall be clearly marked with the following information:
      a. Manufacturer's Name or Trademark;
      b. ASTM Standard Designation;
      c. Nominal Pipe Size;
      d. Class & Profile Number;
      e. Production Code, including Extrusion Date, and Lot or Batch Number; and
      f. Standard Dimension Ratio.

F. The pipe and fitting manufacturer shall certify that samples of production pipe have undergone stress regression testing, evaluation, and validation in accordance with ASTM D2837 and PPI TR-3. Under these procedures, the minimum hydrostatic design basis shall be certified by the pipe and fitting manufacturer to be 1600 psi at 73.4° F and 800 psi at 140° F.

G. Material shall be listed in the name of the pipe and fitting manufacturer by the Plastics Pipe Institute (PPI) in PPI TR-4 with the following Standard Grade ratings:

		73.4° F	140° F
1.	Hydrostatic Design Basis (HDB)	1,600 psi	800 psi
2.	Hydrostatic Design Stress (HDS)	800 psi	400 psi

H. PPI material listing in the name of the resin supplier is not acceptable in meeting this requirement.

I. Certification:
   1. As the basis of the acceptance of the material, the manufacturer shall furnish a certificate of conformance of this Section upon request. When prior agreement is being made in writing between CONTRACTOR and the

manufacturer, the manufacturer shall furnish other conformance certification in the form of affidavit of conformance, test results, or copies of test reports.

2.3 GASKETS AND HARDWARE

A. All gaskets shall be Viton or other similar materials approved by OWNER. Joint hardware shall be Type 304 stainless steel.

2.4 FITTINGS

A. Fittings shall be manufactured from polyethylene compound having cell classification equal to or exceeding compound used in pipe to ensure compatibility of polyethylene resins.

B. Dimensions of fittings conforming to standard dimensions and tolerances in accordance with ASTMD 3261.

C. Fittings shall have the same or higher pressure rating as pipe.

D. Markings:
1. Manufacturer's name or trademark.
2. Nominal size.
3. Type of plastic pipe (i.e., PE 4710).
4. Standard dimension ratio.
5. Extrusion date, lot number or batch number.

E. The Drawings do not show all fittings that may be required. Provide all fittings required for a complete installation.

PART 3 – EXECUTION

3.1 FIELD QUALITY CONTROL

A. Pipe may be rejected for failure to conform to any of the following:
1. Fractures or cracks passing through pipe wall, except single crack not exceeding 2 inches in length at either end of pipe, which may be cut off and discarded. All pipes within one shipment shall be rejected if defects exist in more than five percent of shipment or delivery.
2. Cracks sufficient to impair strength, durability, or service ability of pipe.
3. Defects indicating improper proportioning, mixing, and molding.
4. Damaged ends, where such damage prevents making satisfactory joint.
5. Damage due to handling or installation. Scratches and gouges exceeding five percent of the wall thickness shall be considered excessive, and may be rejected by ENGINEER or OWNER.

B. Acceptance of fittings, stubs, or other specially fabricated pipe sections shall be based on visual inspection by ENGINEER and documentation of conformance to this Section.

C. Prior to backfilling trench CONTRACTOR shall obtain as-built top of pipe coordinates and elevations at grade changes, terminations, fittings, and at least every 50 feet along the pipe.

3.2 INSTALLATION

A. Trench, backfill, and compact in accordance with Specification Section 02565.

B. Heat Fusion of Pipe:

1. Weld pipe in accordance with manufacturer's recommendation for butt fusion methods. The pipe manufacturer shall certify fusion machine operators.
2. Butt fusion equipment for joining procedures shall be capable of meeting conditions recommended by pipe manufacturer including, but not limited to, temperature, alignment, and fusion pressures.
3. Branch saddle fusions shall be joined in accordance with manufacturer's recommendations and procedures. Branch saddle fusion equipment shall be of a size to facilitate saddle fusion within the trench.
4. For cleaning pipe ends, solutions such as detergents and solvents, when required, shall be used in accordance with manufacturer's recommendations. Solvents shall not be used unless approved by OWNER.
5. Do not bend pipe to greater degree than minimum radius recommended by manufacturer for type and grade.
6. Do not subject pipe to strains that will overstress or buckle pipe or impose excessive stress on joints.
7. Before butt fusing pipe, observe inside of each pipe length for presence of dirt, sand, mud, shavings, and other debris or animals. Remove debris from pipe prior to fusing.
8. Cap open ends of fused pipe at end of each working day to prevent entry by animals, debris, or stormwater.
9. Use compatible fusion techniques when polyethylenes of different melt indexes are fused together. Refer to manufacturer's specifications for compatible fusion.

C. Flange Jointing:
1. Use on flanged pipe connection sections.
2. At a minimum convoluted stainless steel backup rings shall be used for joining HDPE pipes below grade, and epoxy-coated carbon steel backup flanges shall be used above grade, unless stainless steel is specified by OWNER.
3. Butt fuse fabricated flange adapters to pipe or use electrofusion couplings.
4. Observe the following precautions in connection of flange joints:

a. Use full-face gaskets only.
b. All fasteners and back-up rings shall be Type 18-8 or Type 304 stainless steel below grade, and zinc-plated steel above grade.
c. Align flanges or flange/valve connections to provide tight seal.
d. U.S. Standard round washers may be used on some flanges when in accordance with manufacturer's recommendations. Bolts shall be lubricated prior to installation.

5. Protect below grade bolts and flanges by covering with a 6-mil thick PE wrap. Duct tape wrap to HDPE pipe.
6. Electrofusion couplers, where used, shall be installed per manufacturer's specifications. The outside diameter of the HDPE pipe and face shall be prepared in accordance with manufacturer's recommendations prior to installing the coupler.

D. Pipe Placement:
1. Grade control equipment shall be of the type to accurately maintain design grades and slopes during installation of pipe.
2. Unless otherwise specifically stated, install pipe in accordance with manufacturer's recommendations.
3. Maximum lengths of fused pipe to be handled as one section shall not exceed 400 feet and shall be placed according to the manufacturer's recommendations as to pipe size, pipe SDR, and topography so as not to cause excessive gouging or surface abrasion. Pipe wall gouges deeper than 3/16-inch may be cause for rejection of the pipe.
4. Cap pipe sections longer than single joint (usually 40 feet) on both ends during placement except during fusing operations.
5. Remove dirt or debris from inside of pipe before backfilling.
6. Notify ENGINEER prior to installing pipe into trench and allow time for observation. CONTRACTOR shall correct irregularities identified during observation.
7. Complete connections within trench whenever possible to prevent overstressed connections.
8. Allow pipe sufficient time to adjust to trench temperature prior to testing, fusion welding, making segment connections, or backfilling activity.
9. To reduce branch saddle stress, install saddles at slope equal to and continuous with connecting pipe.
10. Install reducers adjacent to laterals and tees unless directed otherwise.
11. Place pipe system in trench allowing at least 12 in./100 ft. for thermal contraction and expansion.

3.2 PIPE TESTING

A. CONTRACTOR shall perform a pneumatic test of the non-perforated pipe and fittings, with the exception of the 50-feet of solid pipe installed in the horizontal collection trenches, after placement in the trench, in accordance with manufacturer's recommendations.

B. Pipes shall be pressure tested in presence of ENGINEER. Provide adequate notice to ENGINEER before performing test.

C. Pneumatic testing shall be performed as follows:
   1. The test period at the test pressure shall last no more than 10 minutes.
   2. Provide all necessary connections, bulkheads, flanges, bracing, and blocking, as well as all required test equipment.
   3. Test pressure gauge shall have a recommended range of 20 psig, with minor gradations no greater than 0.1 psig.
   4. Pipe to be tested shall be exposed in the trench, except bends, reduced pressure rated fittings and components, which shall be buried or restrained. Flange connections shall be visible to check for leaks.
   5. Test pressure shall be 10 psig.
   6. Acceptance
      a. Test shall be accepted if the pressure drop over 10 minutes is less than 5 percent of the pressure at the beginning of the test period.

D. Test Report
   1. ENGINEER shall prepare and submit to OWNER a test report using the attached forms for each pipe system tested. Include following information in test report.
      a. Date of test.
      b. Description and identification of pipe system tested.
      c. Type of test performed.
      d. Test fluid.
      e. Test pressure.
      f. Results of test.
      g. Type and location of leaks detected.
      h. Corrective action taken to repair leaks.
      i. Results of retesting.
      j. Name of person performing test.

[END OF SECTION 15210]

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ATTACHMENT 1 TO SECTION 15210
PIPE PRESSURE AIR TEST LOG

SANBORN HEAD		Project No.:	
		Project Name:	
		Project Location:	
		Weather:	
Contractor:		Test No.:	
CQA Personnel:		Person/Company Performing the Test:	
Date of Test:		Time of Test:	Finish:
Pipe Length: ~ ft.	Pipe Diameter: in.	Pipe Material:	Pipe SDR/Sch.:
Rated Working Pressure:		Test Pressure: psi	
Location/designation of pipe tested:			

t Time (min.)	T Pipe Temperature (ºC)	P_t Pressure Gauge Reading (psig)	P_c Pressure Drop (%)
0			
5			
10			
15			
30			
60			

Pass	Fail	Retest? Yes	No

Description of leaks and repairs of retested pipe segments:

P_c = Percent Pressure Drop $\frac{P_o - P_t}{P_o} \times 100$

P_o = Initial Pressure Gauge Reading

P_t = Pressure Gauge Reading at Time t

Comments:

Signature:

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SECTION 15212

POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Supply polyvinyl chloride (PVC) Schedule 80 pipe and fittings as shown on the Drawings.

1.2 SUBMITTALS

A. Submit to ENGINEER manufacturer's technical product data and installation instructions for PVC pipe and fittings.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Pipe and fittings shall be manufactured from a PVC compound which meets the requirements of Cell Classification 12454-B PVC as outlined in ASTM D1784.

B. PVC pipe used in the construction of landfill gas extraction system shall meet the requirements of ASTM D1784 and ASTM D1785 for Schedule 80 PVC pipe.

C. PVC fittings used in the construction of landfill gas extraction system shall meet the requirements of ASTM D2464 and ASTM D2467.

D. All PVC cements shall meet the requirements of ASTM D2564 for solvent cemented PVC joints.

E. Clean rework or recycle material generated by the manufacturer's own production may be used so long as the pipe or fittings produced meet all the requirements of this Section.

F. Fittings shall be industrial, heavy duty, hub style.

G. Socket fittings shall be pressure rated the same as the corresponding size pipe prescribed by ASTM D1785. Threaded fittings shall be pressure rated to at least 50 percent of the rating for socket fittings.

2.2 FLANGES

A. Flanges shall be one piece solid design or two-part Van Stone type that use the tapered, serrated face and full face gasket technique for joining and are compatible with ANSI B16.5 Class 150 metal flanges.

B. Flanges shall be pressure rated at 150 psi for water service at 73°F, non-shock and have a minimum burst requirement of 3.3 times the rated pressure.

C. Bolts shall be zinc-plated ASTM A193, Grade B8M hex head, and nuts shall be zinc-plated ASTM A194, Grade 8M hex head.

D. Gaskets shall be ⅛-inch thick, full face Viton or other similar materials approved by OWNER.

PART 3 - EXECUTION

3.1 PVC PIPE HANDLING

A. PVC pipe and pipe fittings shall be handled carefully in loading and unloading. They shall be lifted by hoists and lowered on skidways in such a manner as to avoid shock. Derricks, ropes, or other suitable equipment shall be used for lowering the pipe into well borings. Pipe and pipe fittings shall not be dropped or dumped.

3.2 PVC PIPE INSTALLATION

A. PVC pipe installation shall conform to the requirements of this Section, the manufacturer's recommendations, and as outlined in ASTM D2774V.

3.3 JOINING OF PVC PIPES

A. Pipes shall be joined in accordance with ASTM D2855.

B. Pipe shall be inspected for cuts, scratches, or other damages prior to installation. Pipe with imperfections shall not be used.

C. Burrs, chips, etc., shall be removed from pipe interior and exterior.

D. Loose dirt and moisture shall be wiped from the interior and exterior of the pipe end and the interior of the fitting.

E. Pipe cuts shall be square and perpendicular to the center line of pipe.

F. A coating of CPS primer, as recommended by pipe supplier, shall be applied to the entire interior surface of the fitting socket, and to an equivalent area on the exterior of the pipe prior to applying solvent cement.

G. The solvent cement shall comply with the requirements of ASTM D2564 and shall be applied in strict accordance with manufacturer's specifications.

H. Pipe and pipe fittings shall be selected so that there will be as small a deviation as possible at the joints, and so that inverts present a smooth surface. Pipe and fittings that do not fit together to form a tight fitting shall be rejected.

[END OF SECTION 15212]

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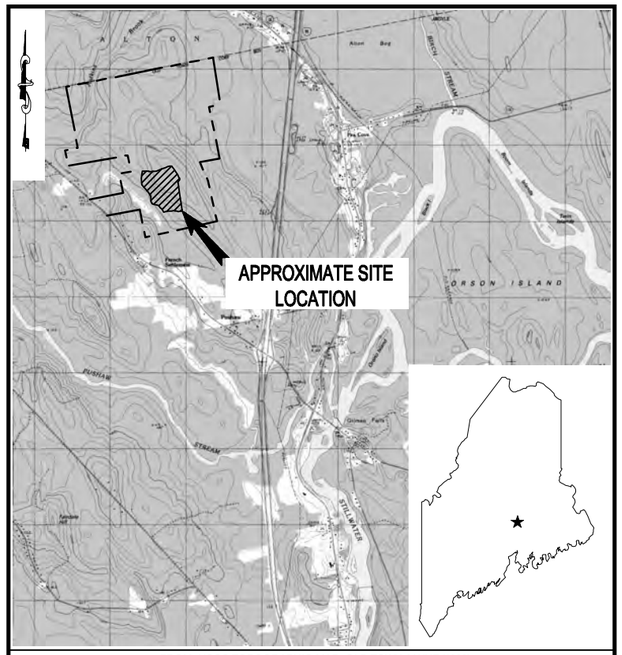
CELL 14 LANDFILL GAS SYSTEM EXPANSION DRAWINGS

JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE
JANUARY 2022



FROM: USGS TOPOGRAPHIC MAP- OLD TOWN, MAINE (1988)

LOCUS PLAN
SCALE: 1"=1000'

SHEET INDEX

SHEET 1	OVERALL SITE PLAN
SHEET 2	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 1
SHEET 3	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 2
SHEET 4	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 3
SHEET 5	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 4
SHEET 6	CROSS-SECTION
SHEET 7-10	DETAILS

STATE OF MAINE
RYAN L. CLAY
16411
LICENSED PROFESSIONAL ENGINEER

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
JANUARY 2022*

PREPARED FOR:

NEWSME LANDFILL OPERATIONS, LLC

JUNIPER RIDGE LANDFILL

OLD TOWN, MAINE

PREPARED BY:

SANBORN HEAD

20 FOUNDRY STREET, CONCORD, NEW HAMPSHIRE 03301
(603) 229-1900 FAX (603) 229-1919

PROJ.#: 2536.36 "CELL 14 LANDFILL GAS SYSTEM EXPANSION DRAWINGS, JUNIPER RIDGE LANDFILL, OLD TOWN, MAINE;" JANUARY 2022

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PLOT DATE: 1-19-22

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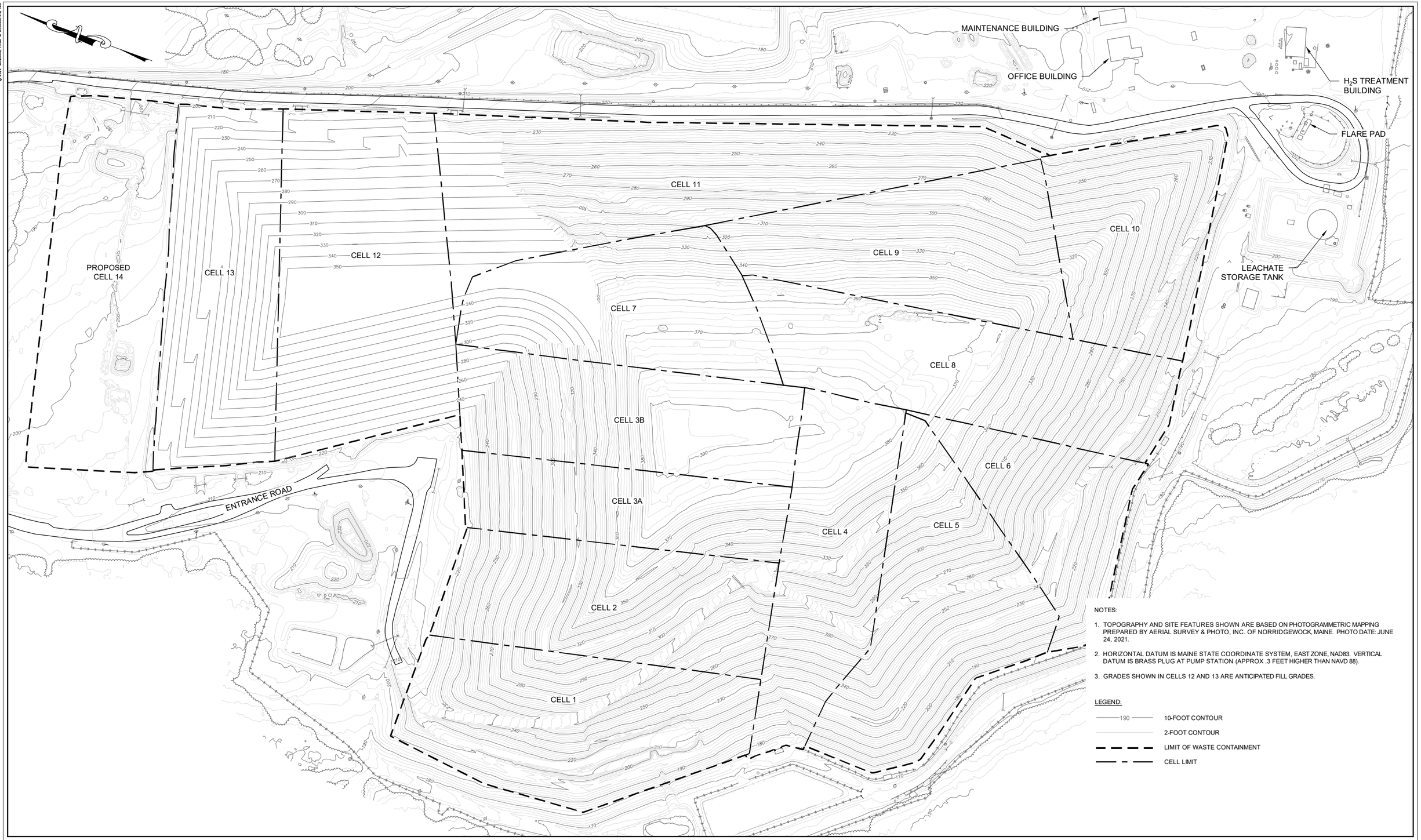

NOTES:

1. TOPOGRAPHY AND SITE FEATURES SHOWN ARE BASED ON PHOTOGRAMMETRIC MAPPING PREPARED BY AERIAL SURVEY & PHOTO, INC. OF NORRIDGEWOCK, MAINE. PHOTO DATE: JUNE 24, 2021.
2. HORIZONTAL DATUM IS MAINE STATE COORDINATE SYSTEM, EAST ZONE, NAD83. VERTICAL DATUM IS BRASS PLUG AT PUMP STATION (APPROX .3 FEET HIGHER THAN NAVD 88).
3. GRADES SHOWN IN CELLS 12 AND 13 ARE ANTICIPATED FILL GRADES.

LEGEND:

- 190 — 10-FOOT CONTOUR
- 2-FOOT CONTOUR
- LIMIT OF WASTE CONTAINMENT
- CELL LIMIT

SANBORN HEAD

GRAPHICAL SCALE
120' 60' 0' 120' 240'

STATE OF MAINE
RYAN L CLAY
16411
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: JANUARY 2022

CELL 14 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.34

OVERALL SITE PLAN

SHEET NUMBER: 1 OF 10

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NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 14 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON NOVEMBER 30, 2021.
3. GRADES SHOWN IN CELL 12 AND CELL 13 REPRESENT ANTICIPATED GRADES EXPECTED DURING CELL 14 FILLING. ACTUAL GRADES AT TIME OF CONSTRUCTION MAY DIFFER FROM THOSE SHOWN.
4. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
5. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
6. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
7. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	
	COLLECTION TRENCH WELLHEAD	GCT-1402
T	COLLECTION TRENCH TERMINATION	T
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE
RYAN L. CLAY
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LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: JANUARY 2022

CELL 14 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.34

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 1

SHEET NUMBER: 2 OF 10

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NOTES:

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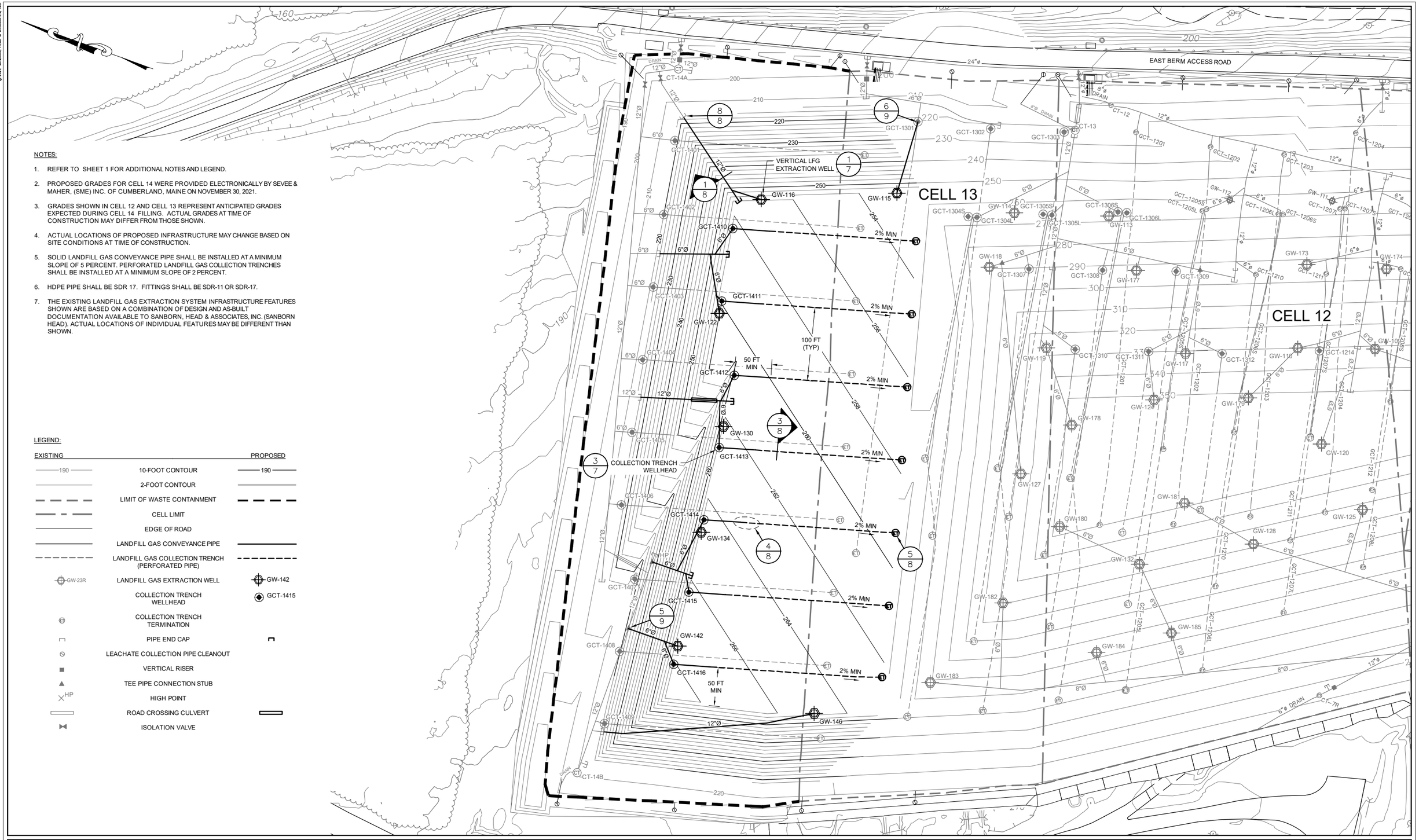
2. PROPOSED GRADES FOR CELL 14 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON NOVEMBER 30, 2021.
3. GRADES SHOWN IN CELL 12 AND CELL 13 REPRESENT ANTICIPATED GRADES EXPECTED DURING CELL 14 FILLING. ACTUAL GRADES AT TIME OF CONSTRUCTION MAY DIFFER FROM THOSE SHOWN.
4. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
5. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
6. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
7. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-142
	COLLECTION TRENCH WELLHEAD	GCT-1415
ET	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	



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SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE
RYAN L. CLAY
16411
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: JANUARY 2022

CELL 14 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 2

PROJECT NUMBER: 2536.34

SHEET NUMBER: 3 OF 10

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NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 14 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON NOVEMBER 30, 2021.
3. GRADES SHOWN IN CELL 12 AND CELL 13 REPRESENT ANTICIPATED GRADES EXPECTED DURING CELL 14 FILLING. ACTUAL GRADES AT TIME OF CONSTRUCTION MAY DIFFER FROM THOSE SHOWN.
4. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
5. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
6. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
7. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-188
	COLLECTION TRENCH WELLHEAD	GCT-1420
	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

CELL 13

CELL 12

EAST BERM ACCESS ROAD

VERTICAL LFG EXTRACTION WELL

COLLECTION TRENCH WELLHEAD

100 FT (TYP)

2% MIN

50 FT MIN

SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE
RYAN L. CLAY
16411
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: JANUARY 2022

CELL 14 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 3

PROJECT NUMBER: 2536.34

SHEET NUMBER: 4 OF 10

FILE: P:\2536\2536.34\Graphics\Final\CAD\Cell 14 Design\02 - 06 - Development Plan.dwg
LAYOUT: Fig - 3PAGE3
USER: rclay
PLOT DATE: 1-12-22 10:49 PM

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NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 14 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON NOVEMBER 30, 2021.
3. GRADES SHOWN IN CELL 12 AND CELL 13 REPRESENT ANTICIPATED GRADES EXPECTED DURING CELL 14 FILLING. ACTUAL GRADES AT TIME OF CONSTRUCTION MAY DIFFER FROM THOSE SHOWN.
4. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
5. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
6. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
7. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-135
	COLLECTION TRENCH WELLHEAD	
ET	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

CELL 13

CELL 12

EAST BERM ACCESS ROAD

EXTEND WELLS AND RISERS TO ACCOMMODATE FILLING OF ACCESS ROAD (TYP)

VERTICAL LFG EXTRACTION WELL (1/7)

SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

STATE OF MAINE
RYAN L CLAY
16411
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: JANUARY 2022

CELL 14 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 4

PROJECT NUMBER: 2536.34

SHEET NUMBER: 5 OF 10

FILE: P:\2536.34\Graphics\Final\CAD\Cell 14 Design\Cl - 08 - Development Plans.dwg
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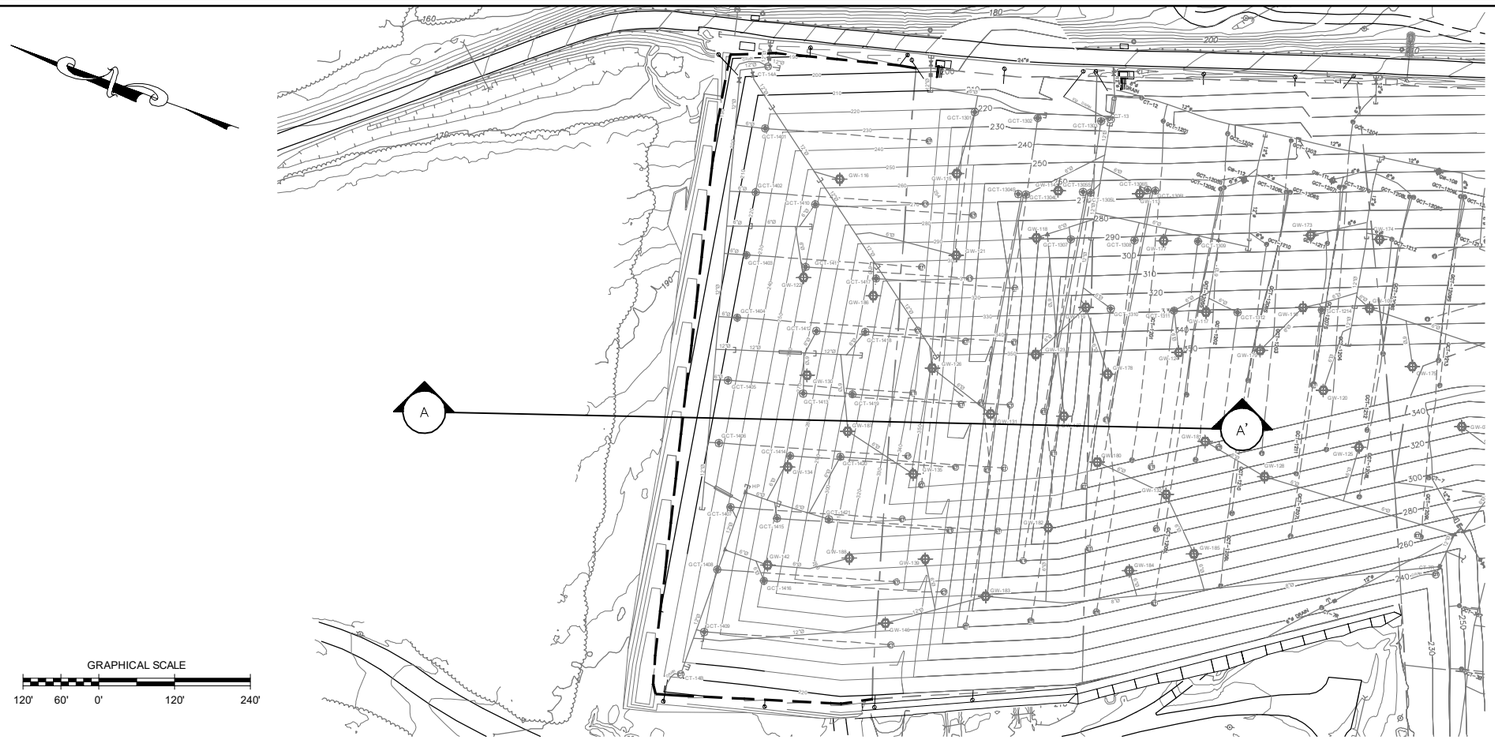
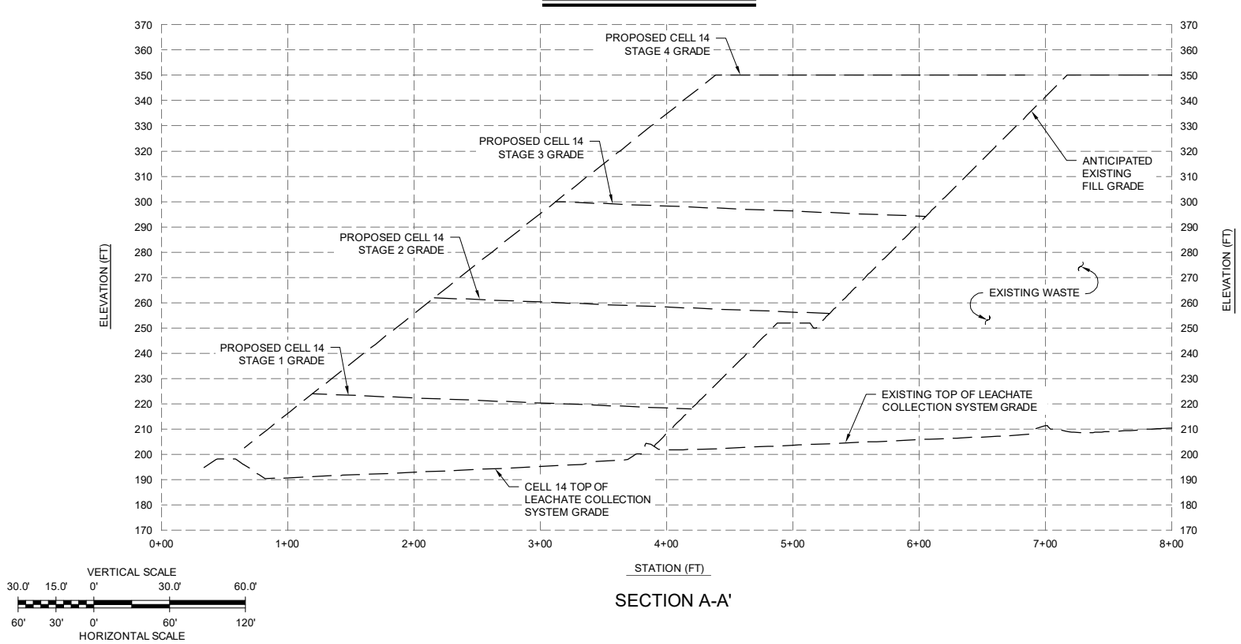


REFERENCE PLAN



SECTION A-A'

NOTES:

1. THE CROSS SECTION SHOWN ON THIS SHEET ILLUSTRATES THE ANTICIPATED FILLING OF CELL 14 AND IS PROVIDED FOR REFERENCE ONLY.
2. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE
RYAN L. CLAY
16411
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: O. HERNANDEZ / R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: JANUARY 2022

CELL 14 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.34

CROSS-SECTION

SHEET NUMBER: 6 OF 10

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PLOT DATE: 1/21/22 - 10:49 PM

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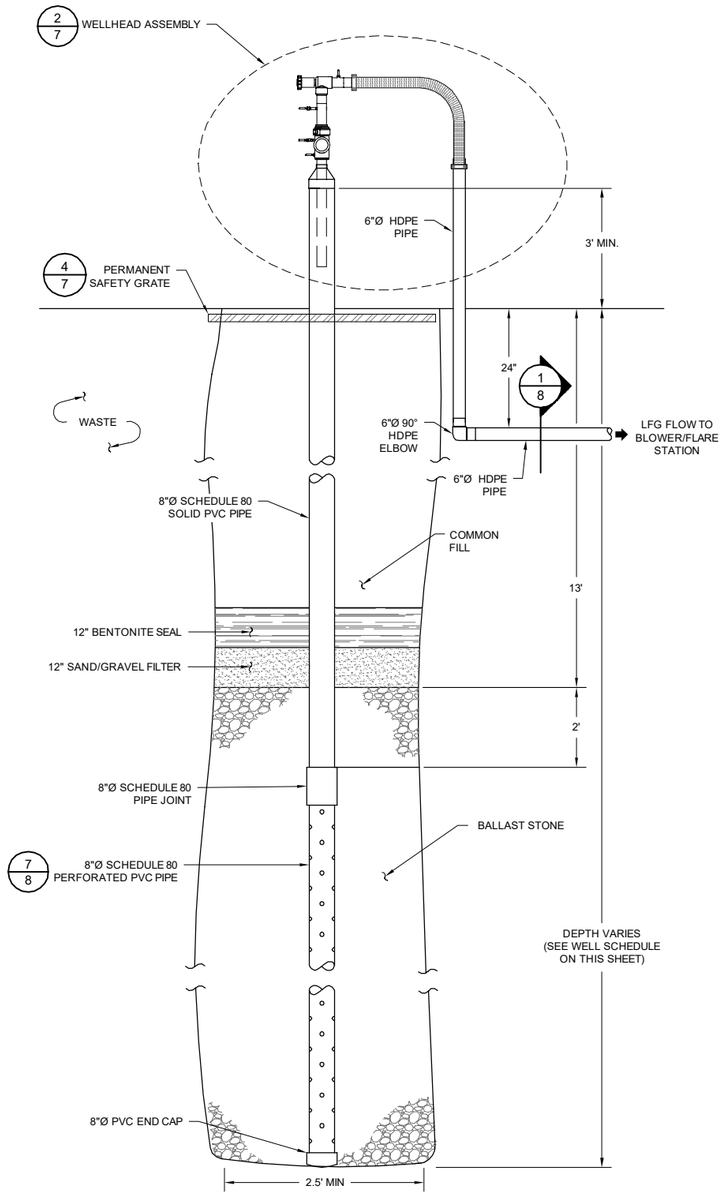


LFG EXTRACTION WELL DETAIL

1

NOT TO SCALE

NOTES:

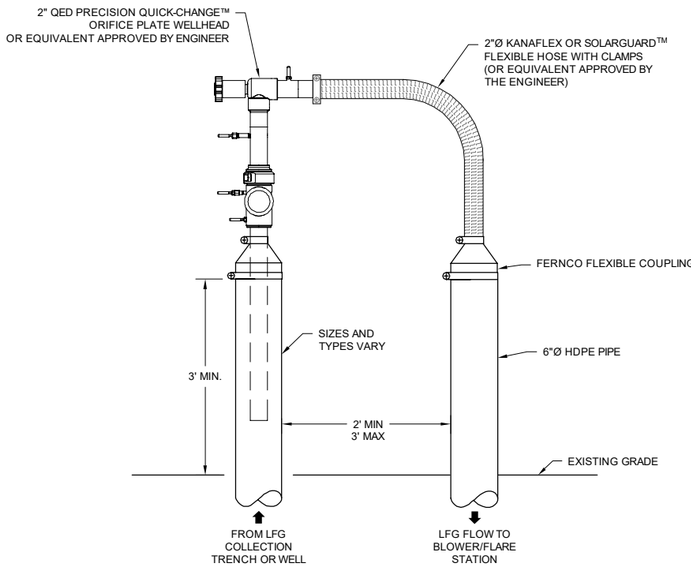
1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.

WELL SCHEDULE NOTES:

1. DRILLING SHALL NOT COMMENCE UNTIL ENGINEER IS PROVIDED AS-BUILT LINER SYSTEM GRADES FOR CELL 14 AND IS GIVEN THE OPPORTUNITY TO UPDATE THE WELL SCHEDULE ACCORDINGLY.
2. LFG EXTRACTION WELLS SHALL BE INSTALLED WITHIN ONE FOOT OF LISTED LOCATIONS AND TO THE NEAREST FOOT IN DEPTH.
3. A TEMPORARY BENCHMARK WITH GROUND SURFACE ELEVATION SHALL BE ESTABLISHED AT EACH WELL PRIOR TO DRILLING.
4. 15 FEET OF SOLID RISER IS TO BE PROVIDED BELOW INTERMEDIATE COVER GRADES. THE INTENT IS TO PROVIDE 3 FEET OF STICK UP ABOVE FILL GRADES.

WELL SCHEDULE

WELL DESIGNATION	NORTHING	EASTING	BOTTOM OF WASTE (FT)	TOP OF EXISTING WASTE (FT)	TOTAL WELL DEPTH (FT)	BOTTOM OF WELL SCREEN (FT)	TOP OF WELL SCREEN (FT)	SCREEN LENGTH (FT)	TOP OF CASING ELEV. (FT)
GW-115	480253.9	926625.6	192.3	254.4	47.1	207.3	239.4	32.1	257.4
GW-116	480425.2	926553.9	183.0	255.6	57.6	198.0	240.6	42.6	258.6
GW-121	480210.6	926503.7	196.2	297.5	86.3	211.2	282.5	71.3	300.5
GW-122	480425.9	926388.2	187.3	259.9	57.6	202.3	244.9	42.6	262.9
GW-123	480038.6	926399.6	203.2	350.0	131.8	218.2	335.0	116.8	353.0
GW-126	480185.2	926322.8	200.4	350.0	134.6	215.4	335.0	119.6	353.0
GW-130	480367.7	926244.7	192.3	273.6	66.4	207.3	258.6	51.4	276.6
GW-131	480073.6	926286.6	204.3	350.0	130.7	219.3	335.0	115.7	353.0
GW-134	480347.0	926098.0	195.7	272.4	61.7	210.7	257.4	46.7	275.4
GW-135	480156.2	926154.9	204.3	350.0	130.7	219.3	335.0	115.7	353.0
GW-139	480092.3	926035.1	208.4	304.2	80.8	223.4	289.2	65.8	307.2
GW-142	480323.9	925941.1	199.3	271.4	57.1	214.3	256.4	42.1	274.4
GW-146	480117.0	925918.2	210.3	264.9	39.6	225.3	249.9	24.6	267.9
GW-186	480312.2	926398.6	190.9	305.6	99.6	205.9	290.6	84.6	308.6
GW-187	480277.1	926183.5	196.5	305.5	94.0	211.5	290.5	79.0	308.5
GW-188	480206.0	925995.5	201.8	306.6	89.8	216.8	291.6	74.8	309.6



WELLHEAD NOTES:

A. WELLHEAD SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL. INSTRUCTIONS SHALL BE THOROUGHLY READ BEFORE ATTEMPTING ASSEMBLY AND INSTALLATION OF WELLHEAD.

B. WELLHEAD AND FLOW MEASUREMENT TUBE ASSEMBLY SHALL BE COMPATIBLE WITH LANDTEC GEM-2000 AND GEM-5000 LANDFILL GAS MONITORS.

C. FOR FLEXIBLE CONNECTIONS TO PIPE, USE "IPS WELD-ON 795" PLASTIC PIPE CEMENT OR EQUIVALENT APPROVED BY ENGINEER.

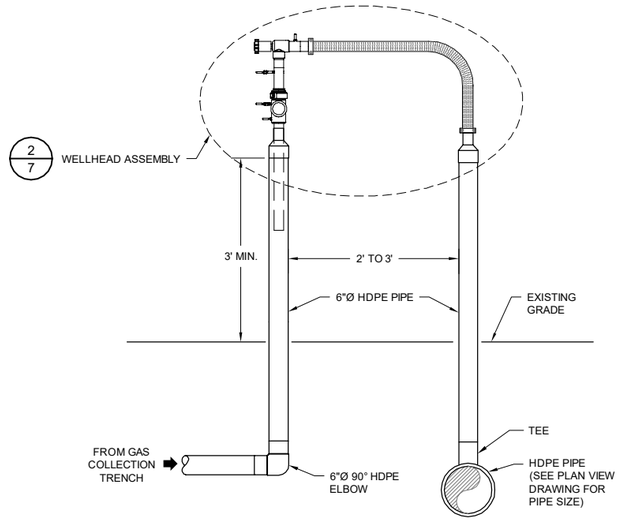
D. WARNING: DO NOT CUT THE FLOW MEASUREMENT TUBE ASSEMBLY. FAILURE TO HEED THIS WARNING WILL RESULT IN A DAMAGED OR INOPERATIVE WELLHEAD AND VOID THE WARRANTY. SUCH DAMAGE WOULD REQUIRE REPLACEMENT OF THE WELLHEAD.

E. ALLOW SUFFICIENT SLACK IN FLEX HOSE FOR PIPE EXPANSION AND CONTRACTION; AN EXTRA 8 TO 12 INCHES IS RECOMMENDED.

WELLHEAD ASSEMBLY

2

NOT TO SCALE



COLLECTION TRENCH WELLHEAD

3

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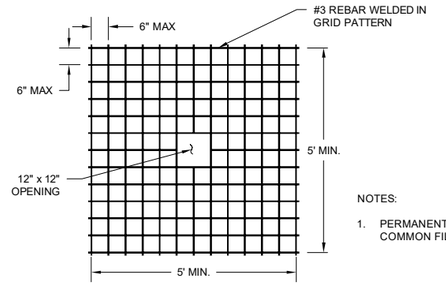

NOTES:

1. PERMANENT SAFETY GRATE TO BE BURIED IN COMMON FILL AT EACH WELL LOCATION.

PERMANENT SAFETY GRATE

4

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE RYAN L. CLAY 16411 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: JANUARY 2022

CELL 14 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.34

DETAILS

SHEET NUMBER: 7 OF 10

FILE: P:\2536\2536.34\Graphics\Final\CAD\Cell 14 Dwg\SET - 8\ - Cell14.dwg
LAYOUT: 7 - DETAILS
LTSCALE: 1.0000
PLOT DATE: 1-3-22

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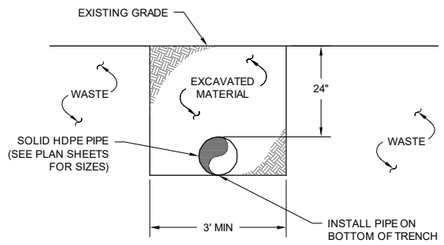
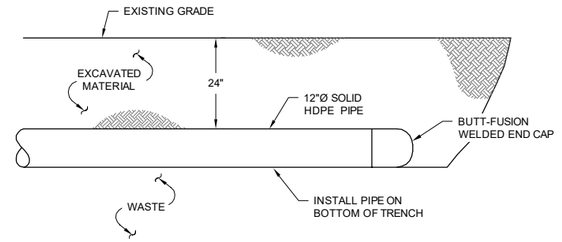
NOTES:

1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.



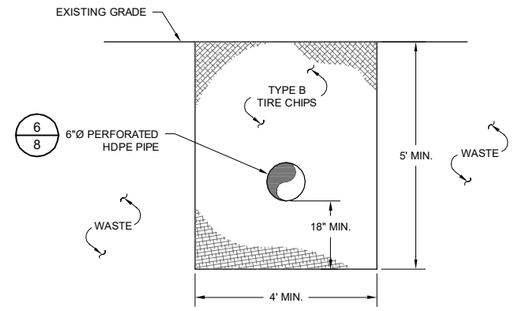
1 SOLID PIPE TRENCH

NOT TO SCALE



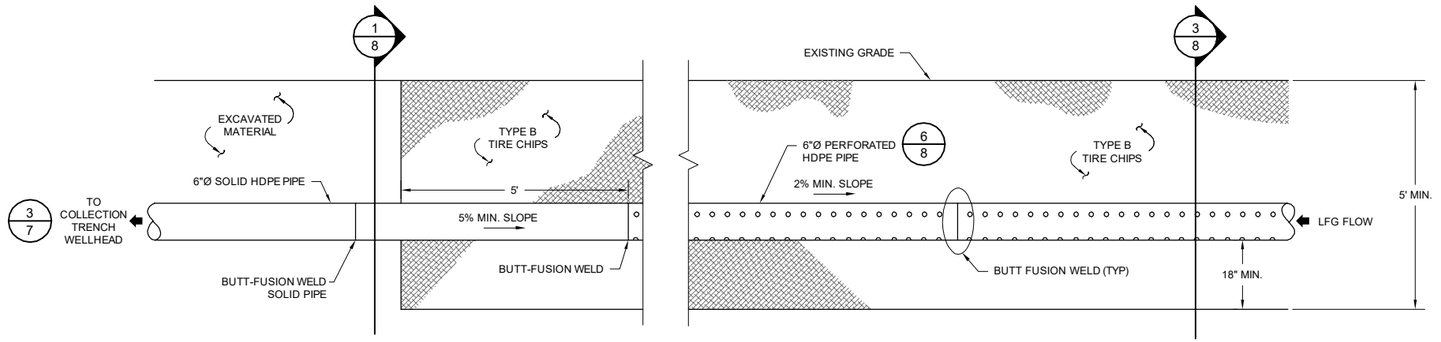
2 TEMPORARY SOLID PIPE TERMINATION

NOT TO SCALE



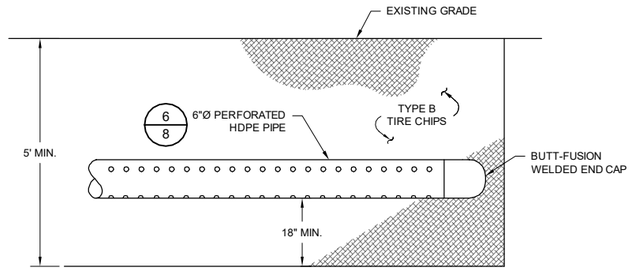
3 LFG COLLECTION TRENCH

NOT TO SCALE



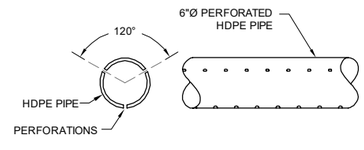
4 LFG COLLECTION TRENCH TRANSITION

NOT TO SCALE



5 COLLECTION TRENCH TERMINATION

NOT TO SCALE

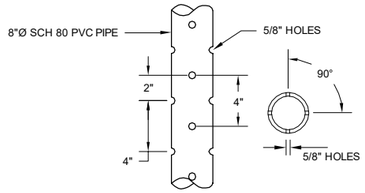


NOTE:

1. HOLES SHALL BE 1/2"Ø DRILLED HOLES SPACED 12" APART ALONG THE LENGTH OF THE PIPE OR APPROVED EQUIVALENT BY OWNER.

6 PERFORATED HDPE PIPE

NOT TO SCALE (GAS COLLECTION TRENCHES)

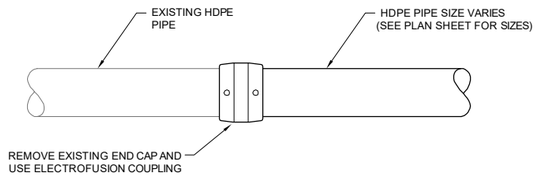


NOTES:

1. PERFORATIONS SPACED 90° APART HORIZONTALLY.
2. PERFORATIONS SPACED 4" APART VERTICALLY.
3. 90° AND 270° ROWS STAGGERED 2" BELOW 0° AND 180° ROWS.

7 PERFORATED PVC PIPE

NOT TO SCALE (LFG EXTRACTION WELLS)



8 CONNECTION TO EXISTING CONVEYANCE PIPE

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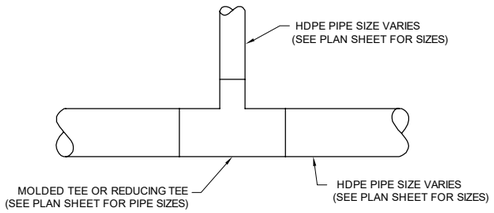

PLAN VIEW

9 "TEE" INSTALLATION

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE RYAN L CLAY 16411 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: JANUARY 2022

CELL 14 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.34

DETAILS

SHEET NUMBER: 8 OF 10

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USER: Ryan.Clay@sanborn.com
CTB FILE: BH Standards
PLOT DATE: 1-18-22

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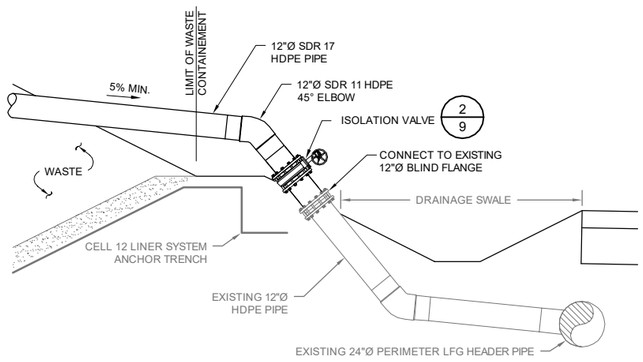
NOTES:

1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.



CONNECTION AT PERIMETER HEADER

1

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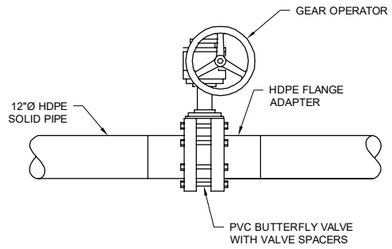
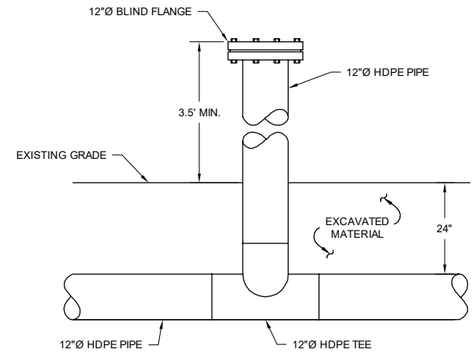


ISOLATION VALVE

2

NOT TO SCALE



VERTICAL RISER

3

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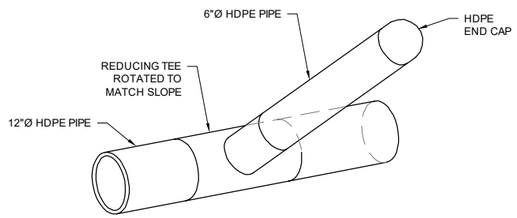
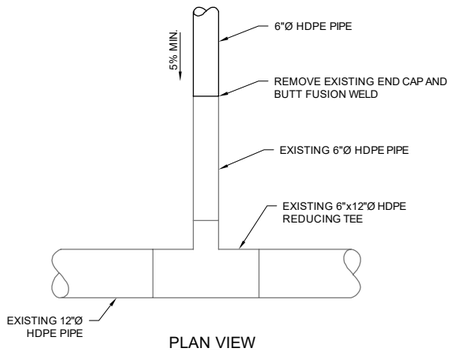


ISOMETRIC VIEW

6"Ø PIPE STUB

4

NOT TO SCALE

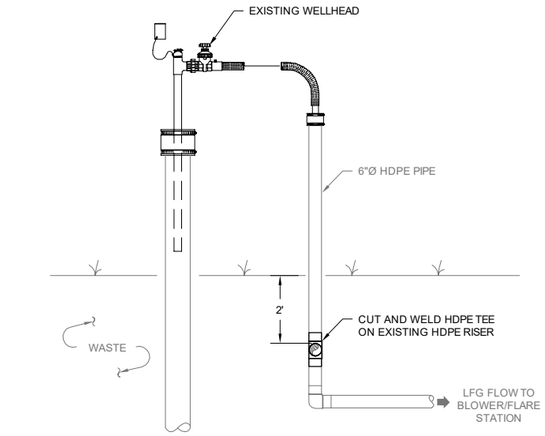


PLAN VIEW

CONNECTION TO EXISTING 6"Ø STUB

5

NOT TO SCALE



CONNECT TO VACUUM SOURCE AT EXISTING LFG WELL

6

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE — RYAN L CLAY — 16411 — LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: JANUARY 2022

CELL 14 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

DETAILS

PROJECT NUMBER: 2536.34

SHEET NUMBER: 9 OF 10

FILE: P:\2500s\2536.34\Graphics\Final\CAD\Cell 14 Drawings\01 - Details.dwg
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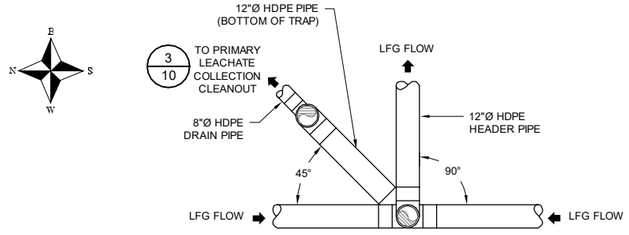
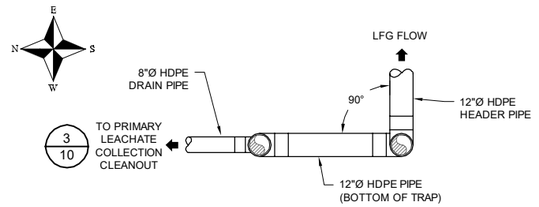
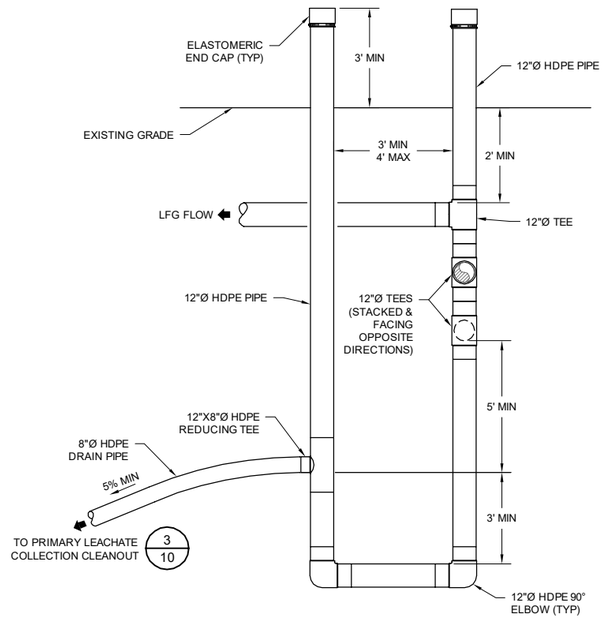


PLAN VIEW



PLAN VIEW

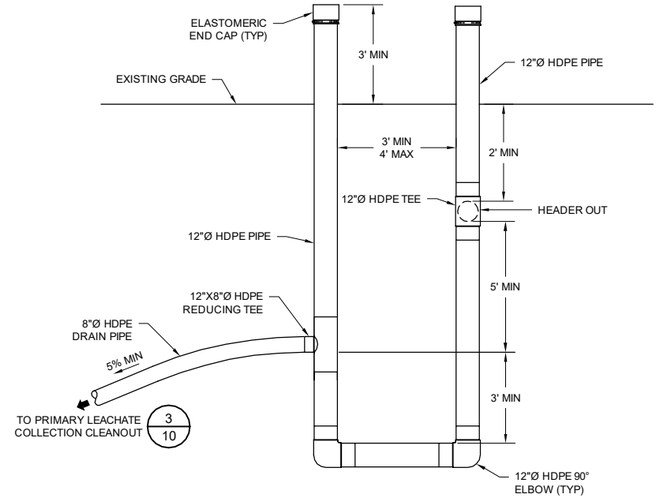


ELEVATION VIEW

CONDENSATE TRAP CT-14A

1

NOT TO SCALE



ELEVATION VIEW

CONDENSATE TRAP CT-14B

2

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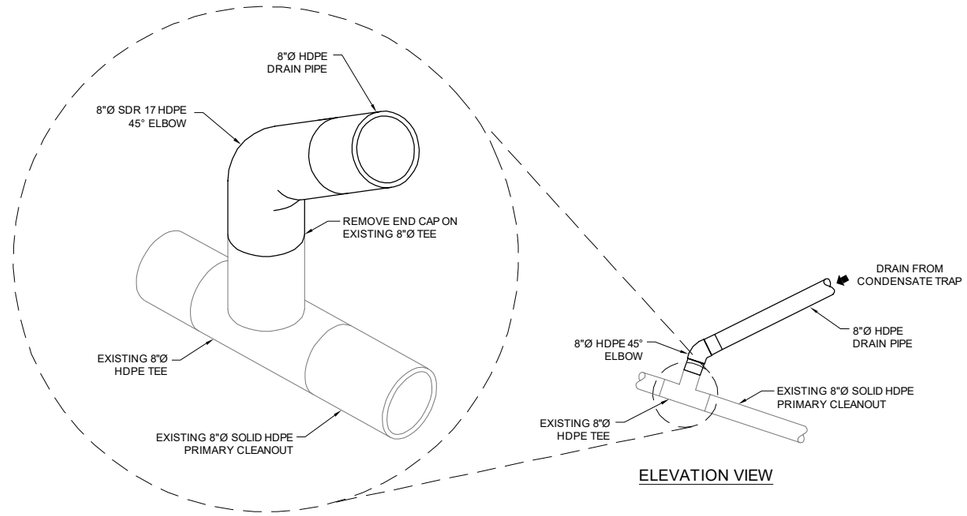

ELEVATION VIEW

DRAIN TIE-IN TO CELL 14 PRIMARY LEACHATE COLLECTION CLEANOUT

3

NOT TO SCALE

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RYAN
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CLAY
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LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: O. HERNANDEZ
DESIGNED BY: R. CLAY
REVIEWED BY: T. REED
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: JANUARY 2022

CELL 14 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

DETAILS

PROJECT NUMBER: 2536.34

SHEET NUMBER: 10 OF 10

FILE: P:\2500s\2536.34 Cell 14 Design\7-Final\CAD\Cell 14 Design.dgn - 10 - Details.dwg
USER: Ryan.Clay@sanbornhead.com
CTB FILE: SH-ANSI.ctb
PLOT DATE: 1/18/22

CELL 15 Development / Landfill Gas System Expansion Drawings

JUNIPER RIDGE LANDFILL
CELL 15 DEVELOPMENT

1.0 CELL 15 SYSTEM OVERVIEW

Cell 15 is approximately 7 acres in size and provides approximately 2.1 million cubic yards of disposal capacity. Cell 15 is located north of existing Cell 1, Cell 2, Cell 3A, and Cell 3B and west of Cell 12 and its liner system will tie-into these adjacent cells. The location and base grades for Cell 15 are shown on Figure 15-1. Cell 15 will be constructed and put into operation in 2023.

The Cell 15 liner system will consist of a composite leachate collection and primary liner, a leak detection system, a secondary liner, and an augmented liner.

The composite leachate collection and primary liner will consist of the following components:

- A 12-inch layer of sand ($K \geq 5x10^{-3}$ cm/sec);
- A network of 6-inch and 8-inch diameter perforated HDPE pipe;
- A geocomposite drainage net with a minimum calculated require transmissivity of $3.2 x10^{-4}$ m^2/sec;
- An 80-mil high-density polyethylene (HDPE) textured geomembrane;
- A geosynthetic clay liner (GCL);
- A 12-inch clay barrier soil layer (hydraulic conductivity (K) less than or equal to $1x10^{-7}$ cm/sec); and
- A dedicated leachate collection pump system.

The leak detection system and secondary liner has been designed to detect leaks within 30 days and will consist of the following components as shown on the Construction Drawing details contained in Appendix F:

- A 12-inch layer of sand ($K \geq 5x10^{-3}$ cm/sec);
- A geocomposite drainage net with a minimum calculated require transmissivity of $9.65x10^{-5}$ m^2/sec;
- A 60-mil HDPE textured geomembrane;
- A 12-inch clay barrier soil layer (K less than or equal to $1x10^{-7}$ cm/sec);
- A network of 6-inch diameter perforated HDPE pipe; and

- A dedicated leak detection pump system.

The entirely of the cell has portions where the soil depth between the bedrock and landfill base grades is less than five feet and the secondary liner will be augmented, with a GCL and 12 inches of clay (K less than or equal to $1x10^{-7}$ cm/sec) to provide a composite secondary liner.

Leachate Collection

The Cell 15 leachate collection system consists of a 12-inch layer of granular material with a hydraulic conductivity greater than 5 $x10^{-3}$ cm/sec, perforated HDPE laterals (minimum diameter 6 inches) and a perimeter transport pipe (minimum diameter 8 inches), stone pipe filter wrapped in geotextile, and a drainage geocomposite. Cleanouts are provided for the Cell 15 leachate laterals and perimeter transport piping. The leachate collection system is a gravity drain system which flows to the Cell 15 collection sump and pump system located at the northwest corner of the Cell. Leachate that accumulates in the Cell 15 sump will be pumped to the 900,000-gallon above ground storage tank via the existing dual contained force main for temporary storage prior to trucking the leachate off-site for treatment.

The Cell 15 leachate pump system consists of a primary 5-horsepower pump, located in the bottom of the sump and accessed through a 24-inch riser pipe, and a secondary 5-horsepower pump, located in a separate 24-inch riser pipe directly adjacent to the primary 24-inch riser. The primary pump has the ability to pump design flows, while the secondary pump serves as a backup. Both pumps are piped through a header system to the existing dual-containment leachate force main infrastructure in the northwest corner of the permitted expansion area. The pumping calculations are provided in Appendix A-2 of the Cell 15 Design Report.

Leak Detection

The Cell 15 leak detection system consists of a 12-inch layer of granular material with a hydraulic conductivity greater than 5 $x10^{-3}$ cm/sec, perforated HDPE laterals (minimum diameter 6 inches) and a perimeter transport pipe (minimum diameter 6 inches), stone pipe filter wrapped in geotextile, and a drainage geocomposite. Cleanouts are provided for the Cell 15 leak detection laterals and perimeter transport piping. Liquids that collect in the Cell 15 leak detection layer drain to the leak detection sump, located on the northwest side of the cell. The sump has a 0.5 horsepower pump that pumps liquids into the leachate collection sump. The leak detection pump system is equipped with a flow meter and sample port to monitor leak detection flows and water quality. The leak detection system has the hydraulic capacity to transmit the predicted flows associated with the Cell 15 primary liner action leakage rate and rapid and large leakage rate. A small wooden structure is constructed over both the leachate collection and leak detection piping to provide weather protection.

2.0 CELL 15 DEVELOPMENT

Initial conditions prior to waste placement into Cell 15 are shown on Figure 15-1. After the initial placement of approximately 50,000 CY of waste for the 5-foot soft/frost-protection layer within Cell 15, waste placement and operations of Cell 15 will be performed in accordance with the operating procedures contained in Section 7.0 of the JRL Operations Manual. The five (5) stages of waste placement are shown on Figures 15-2 through 15-6. Associated operational details are shown on Figures 15-7, 15-8, and 15-9: final cover termination at top of slopes, final cover system, cover system anchor trench at top of slopes and sideslope perimeter berms, and intermediate berm base liner connection (Figure 15-7); leachate collection inlet, temporary mid-slope intermediate berm, perimeter berm intermediate geomembrane cover, temporary up-slope stormwater diversion berm and the Cell 15 access ramp (Figure 15-8), and downspout section, perimeter berm downspout profile and plunge pool (Figure 15-9). Access to Cell 15 will initially be from the northeast corner of the cell off the existing landfill perimeter road. The ramp will be constructed over the perimeter berm as detailed on Figure 15-8.

Portions of Cell 15 waste placement will be intergraded with the northern sideslope of Cell 1, Cell 2, Cell 3A, and Cell 3B and the western sideslope of Cell 12. Prior to filling against the existing sideslopes, a temporary up-slope stormwater diversion berms will be constructed to divert clean stormwater runoff away from the active operating area as detailed on Figure 15-8. Initial waste placement will be within a two-foot setback from the Cell 15 perimeter berm interior slope to allow the infiltration of stormwater that comes in contact with exposed waste to drain into the perimeter drainage sand. After the intermediate geomembrane cover is installed during the first stage of Cell 15 construction, this area will become a temporary stormwater drainage ditch that will direct stormwater to the perimeter ditches.

Waste placement operations in Cell 15 will progress until Stage 1 grades are achieved as shown on Figure 15-2. Runoff from the intermediate geomembrane covering the sideslopes of Stage 1 thru Stage 5 will flow via a temporary stormwater ditch constructed along the inside edge of the landfill and discharge to Detention Pond 1.

Operational controls and waste filling will progress for Stages 2 and 3 as shown on Figures 15-3 and 15-4, respectively. As the waste elevation approaches the final elevation in each stage, leachate transport piping, leachate collection inlets, landfill gas infrastructure and intermediate geomembrane cover will be installed in preparation for the operation of the next stage. The filling of Stages 2 and 3 will include the construction of the landfill access ramp graded as shown on Figures 15-3 and 15-4. The access ramp is constructed with a 2-foot-high berm on the outside edge and a 2-foot deep stormwater ditch on the inside edge. Stage 4 and Stage 5 will be accessed using the newly constructed East Road and filling of Stage 4 includes waste placement over the access ramp used to access Stages 1 thru 3 as well as in the adjacent access ramp stormwater ditch. The waste below the landfill access ramp and all berms constructed of waste must be a high shear strength waste such as construction and demolition debris. High strength

waste is defined as waste with adequate strength such that it can be piled while maintaining sideslopes of 1 horizontal to 1 vertical (1H:1V). High strength wastes would not include materials such as sludges or other high moisture content materials.

Upon completion of the cell development stages of Cell 15, intermediate cover will be in place over the entire waste surface of the developed area and maintained until the final cover is constructed over this area.

3.0 LANDFILL GAS INFRASTRUCTURE PLACEMENT

The landfill gas infrastructure will be placed as described in Appendix J of the JRL Operations Manual and as shown on the Landfill Gas Development Plans included in Appendix D of the Design Report.

CELL 12

CELL 13

CELL 3B

CELL 3A

CELL 2

CELL 4

CELL 5

CELL 1

TEMOPRARY LEACHATE COLLECTION INLET

EXTEND DRAIN TO BE USED IN UPPER STAGES

EXISTING HAYBALE DIVERSION BERM (TYP)

CELL 15 ACCESS ROAD (TYP)

CELL 15 BASE GRADES (TYP)

CELL 15 LINER LIMIT (TYP)

GRAVEL MAINTENANCE ROAD (TYP)

LEACHATE COLLECTION LATERAL (TYP)

CELL 15 TEMPORARY DIVERSION BERM

CELL 15 GRAVEL MAINTENANCE ROAD (TYP)

24" DIA CORR PE CULVERT (TEMPORARY)
L = +/- 30'
INV IN 191.0
INV OUT 190.5

CELL 15 PUMP STATION

CLEAN STORMWATER FLOW (TYP)

PERIMETER ACCESS ROAD (TYP)

DP-1

DP-1A

MH A

MH B

CELL 15 LINED AREA = 7.0 ACRES

30 0 60 120 FEET

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

NOTES:

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, ACCESS ROADS, AND PERMITTED LANDFILL BOUNDARY, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED NOVEMBER 9, 2022.
2. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC (SME) OF CUMBERLAND, MAINE USING PROPELLER AEROPOINTS, DATED NOVEMBER 15, 2019:
   HORIZONTAL DATUM - NAD83 MAINE, WEST, US FT.
   VERTICAL DATUM - NAVD 88, US FT.
3. REMAINDER OF BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/24/21. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.
4. WETLAND BOUNDARIES DELINEATED BY STANTEC OF TOPSHAM, MAINE.
5. BASEGRADES WITHIN CELL 14 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
6. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM.
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

FIGURE 15-1
CELL 15 - DEVELOPMENT
INITIAL CONDITIONS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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DWG: DWG NAME LMN: C15-INITIAL CTB: SME-STD REV: 1/13/2023

N:\Server\Active\Cowlin\2021\win\Landfill\Fig\win\C15-CELLDEV.dwg, FIG 15-1, 1/13/2023 2:04:48 PM, sjm

NOTES:

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, ACCESS ROADS, AND PERMITTED LANDFILL BOUNDARY, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED NOVEMBER 9, 2022.
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7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM.
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

CELL 12
CELL 13
CELL 3B
CELL 3A
CELL 2
CELL 1
CELL 4
CELL 5
TEMOPRARY LEACHATE COLLECTION INLET
8"LC
EXISTING HAYBALE DIVERSION BERM (TYP)
CELL 15 ACCESS ROAD (TYP)
STAGE 1 OPERATIONAL GRADES (TYP)
GRAVEL MAINTENANCE ROAD (TYP)
ALTERNATE CELL ACCESS
CELL 15 LINER LIMIT (TYP)
SUMP AREA TO REMAIN OPEN
CELL 15 PUMP STATION
CELL 15 TEMPORARY DIVERSION BERM
CELL 15 GRAVEL MAINTENANCE ROAD (TYP)
CLEAN STORMWATER FLOW (TYP)
24"LFG
PERIMETER ACCESS ROAD (TYP)
MH B
SEE STAGE PREP DETAIL FIGURE 15-8
DP-1
DP-1A
6"FM
UE

ESTIMATED STAGE 1
CAPACITY = 209,000 CY
INCLUDING SOFT LAYER
VOLUME = 50,000 CY

30 0 60 120 FEET

FIGURE 15-2
CELL 15 - DEVELOPMENT STAGE 1
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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DWG: DWG NAME LMN: C15-STAGE 2 CTB: SME-STD REV: 1/13/2023

V:\Harvard\Civil\Cadd\ACD\Twn\Land\FCAD\Land\Figures\C15-CELL\DEV.dwg, FIG 15-2, 1/13/2023 2:26:41 PM, vjm

NOTES:

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, ACCESS ROADS, AND PERMITTED LANDFILL BOUNDARY, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED NOVEMBER 9, 2022.
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4. WETLAND BOUNDARIES DELINEATED BY STANTEC OF TOPSHAM, MAINE.
5. BASEGRADES WITHIN CELL 14 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
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7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM.
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

CELL 12
CELL 13
CELL 3B
CELL 3A
CELL 2
CELL 4
CELL 5
CELL 1
TEMOPRARY LEACHATE COLLECTION INLET
8"LC
CELL 15 ACCESS ROAD (TYP)
EXISTING HAYBALE DIVERSION BERM (TYP)
STAGE 2 OPERATIONAL GRADES (TYP)
ALTERNATE CELL ACCESS
GRAVEL MAINTENANCE ROAD (TYP)
CELL 15 LINER LIMIT (TYP)
SUMP AREA TO REMAIN OPEN
CELL 15 PUMP STATION
CELL 15 TEMPORARY DIVERSION BERM
CELL 15 GRAVEL MAINTENANCE ROAD (TYP)
PERIMETER ACCESS ROAD (TYP)
TEMPORARY UP-SLOPE DIVERSION BERM SEE FIGURE 15-7
EXISTING PLUNGE POOL
CLEAN STORMWATER FLOW (TYP)
24"LFG
MH B
FORMER LEACHATE DRUM DP-1
DP-1A
6"FM
8"GS
6"LD
UE

ESTIMATED STAGE 2
CAPACITY = 410,000 CY

30 0 60 120 FEET

FIGURE 15-3
CELL 15 - DEVELOPMENT
STAGE 2
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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DWG: DWG NAME LMN: C15-STAGE 2 CTB: SME-STD REV: 1/13/2023

\\server\cfs\Cadd\JOT\ent\Jeff\Cell15\Jeff\Dwg\new\15-CELL15\Dwg FIG 15-3, 1/13/2023 2:06:14 PM, ejm

NOTES:

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, ACCESS ROADS, AND PERMITTED LANDFILL BOUNDARY, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED NOVEMBER 9, 2022.
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5. BASEGRADES WITHIN CELL 14 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
6. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM.
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

CELL 3B
CELL 3A
CELL 12
CELL 13
CELL 2
CELL 4
CELL 5
CELL 15 ACCESS ROAD (TYP)
EXISTING HAYBALE DIVERSION BERM (TYP)
STAGE 3 OPERATIONAL GRADES (TYP)
UPPER STAGES CELL ACCESS
GRAVEL MAINTENANCE ROAD (TYP)
CELL 15 LINER LIMIT (TYP)
SUMP AREA TO REMAIN OPEN
CELL 15 PUMP STATION
CELL 15 TEMPORARY DIVERSION BERM
CELL 15 GRAVEL MAINTENANCE ROAD (TYP)
TEMPORARY UP-SLOPE DIVERSION BERM SEE FIGURE 15-7
EXISTING PLUNGE POOL
PERIMETER ACCESS ROAD (TYP)
CLEAN STORMWATER FLOW (TYP)
24"LFG
6"FM
8"GS
MH B
DP-1
DP-1A
MH#3
MH#5
MH#8
MH#9
KO#2
UE
LD

ESTIMATED STAGE 3 CAPACITY = 373,000 CY

30 0 60 120 FEET

FIGURE 15-4
CELL 15 - DEVELOPMENT STAGE 3
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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DWG: DWG NAME LMN: C15-STAGE 3 CTB: SME-STD REV: 1/13/2023

\\Server\Projects\Casella\247\acad\MSW\Cell15\Acad\Figures\C15-CELL15EV.dwg, FIG 15-4, 1/13/2023 2:08:07 PM, sjm

NOTES:

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, ACCESS ROADS, AND PERMITTED LANDFILL BOUNDARY, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED NOVEMBER 9, 2022.
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LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

CELL 3B
CELL 3A
CELL 12
CELL 13
CELL 2
CELL 4
CELL 5
TEMPORARY LEACHATE COLLECTION INLET
EXTEND EXISTING DRAIN PIPE TO TEMPORARY LEACHATE COLLECTION INLET
STAGE 4 OPERATIONAL GRADES (TYP)
UPPER STAGES CELL ACCESS
GRAVEL MAINTENANCE ROAD (TYP)
TEMPORARY UP-SLOPE DIVERSION BERM SEE FIGURE 15-7
CELL 15 LINER LIMIT (TYP)
SUMP AREA TO REMAIN OPEN
CELL 15 TEMPORARY DIVERSION BERM
CELL 15 GRAVEL MAINTENANCE ROAD (TYP)
CELL 15 PUMP STATION
EXISTING PLUNGE POOL
PERIMETER ACCESS ROAD (TYP)
CLEAN STORMWATER FLOW (TYP)
24"LFG
MH B
DP-1
DP-1A

ESTIMATED STAGE 4 CAPACITY = 515,000 CY

25 0 50 100 FEET

FIGURE 15-5
CELL 15 - DEVELOPMENT STAGE 4
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

SME SEVEE & MAHER ENGINEERS
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE
4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021
Phone 207.829.5016 • Fax 207.829.5692 • sme-engineers.com

DWG: DWG NAME LMN: C15-STAGE 4 CTB: SME-STD REV: 1/13/2023

\\Server\Acti\Cadd\Old\Town Landfill\Cell15\Autof\Figures\C15-CELL15EV.dwg, FIG 15-5, 1/13/2023 2:38:36 PM, vjm

NOTES:

1. CONTOURS AND AERIAL PHOTO WITHIN LIMITS OF EXISTING CELLS, BORROW PIT, DETENTION PONDS, ACCESS ROADS, AND PERMITTED LANDFILL BOUNDARY, FROM LOW ALTITUDE AERIAL PHOTOGRAMMETRIC MAPPING PERFORMED BY SEVEE & MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE, DATED NOVEMBER 9, 2022.
2. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC (SME) OF CUMBERLAND, MAINE USING PROPELLER AEROPOINTS, DATED NOVEMBER 15, 2019:
   HORIZONTAL DATUM - NAD83 MAINE, WEST, US FT.
   VERTICAL DATUM - NAVD 88, US FT.
3. REMAINDER OF BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/24/21. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.
4. WETLAND BOUNDARIES DELINEATED BY STANTEC OF TOPSHAM, MAINE.
5. BASEGRADES WITHIN CELL 14 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
6. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM.
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

LEGEND

- AREA WITH GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON

CELL 7
CELL 3B
CELL 3A
CELL 12
CELL 13
CELL 4
CELL 5
STAGE 5 OPERATIONAL GRADES (TYP)
TEMPORARY LEACHATE COLLECTION INLET
EXTEND EXISTING DRAIN PIPE TO TEMPORARY LEACHATE COLLECTION INLET
CELL 15 LINER LIMIT (TYP)
GRAVEL MAINTENANCE ROAD (TYP)
SUMP AREA TO REMAIN OPEN
DP-1
DP-1A
MH A
24"LFG

ESTIMATED STAGE 5 CAPACITY = 595,000 CY

25 0 50 100 FEET

FIGURE 15-6
CELL 15 - DEVELOPMENT
STAGE 5
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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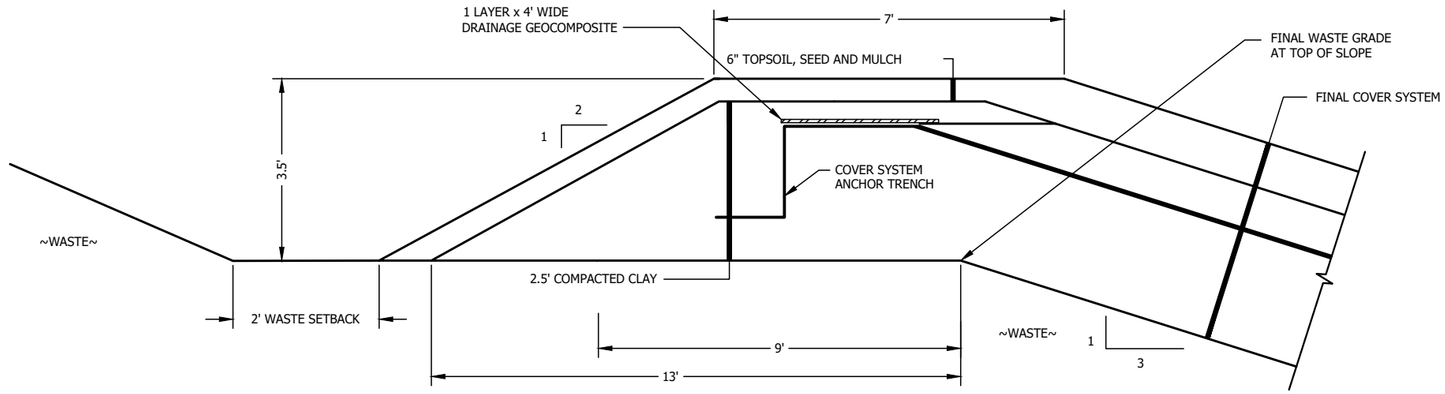
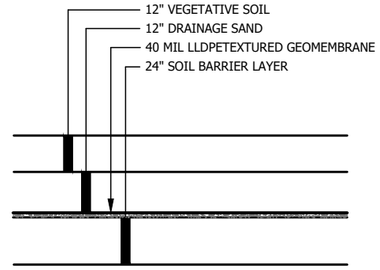
DWG: DWG NAME LMN: C15-STAGE 5 CTB: SME-STD REV: 1/13/2023

\\Server\Archive\Create\2021\work\01\Civil\Xcad\Figures\C15-CELL15EV.dwg, FIG 15-6, 1/13/2023 2:08:03 PM, sjm



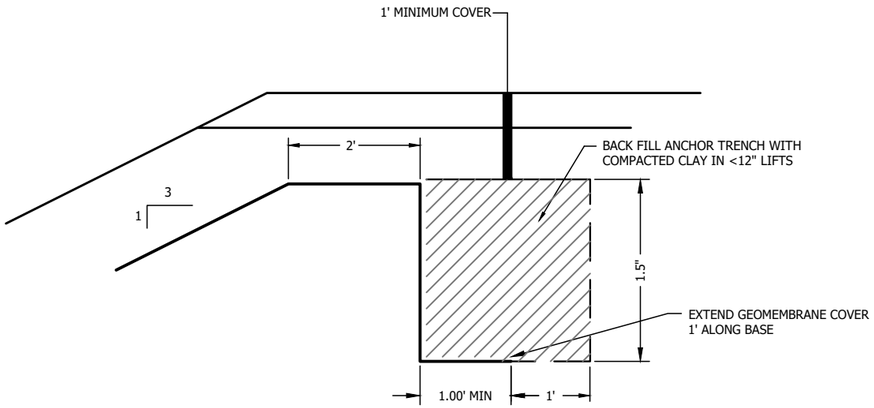
FINAL COVER TERMINATION AT TOP OF SLOPES (TYP)

NTS



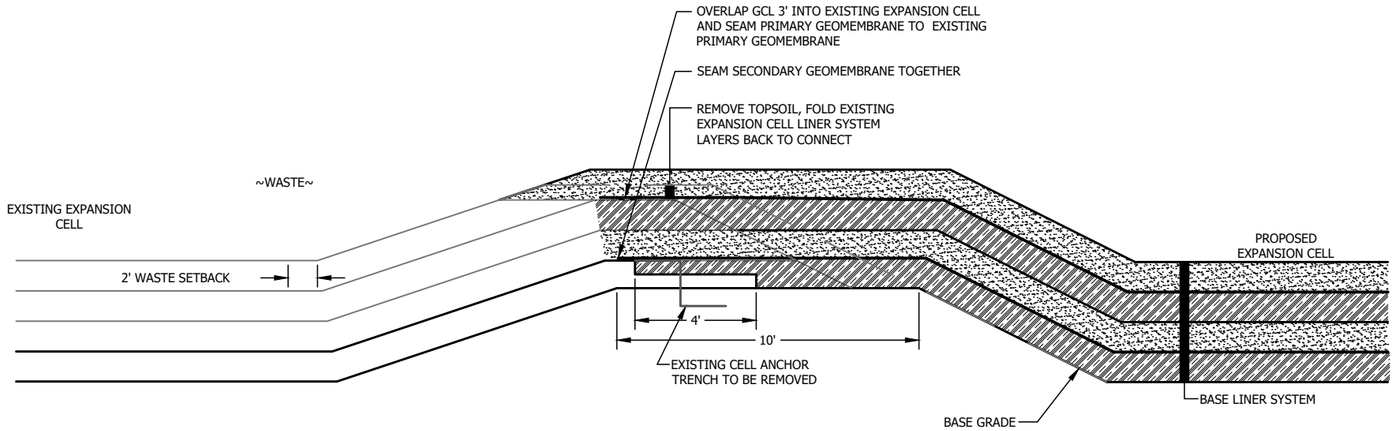
FINAL COVER SYSTEM

NTS



COVER SYSTEM ANCHOR TRENCH AT TOP OF SLOPES AND SIDESLOPE PERIMETER BERMS (TYP)

NTS



INTERMEDIATE BERM BASE LINER CONNECTION

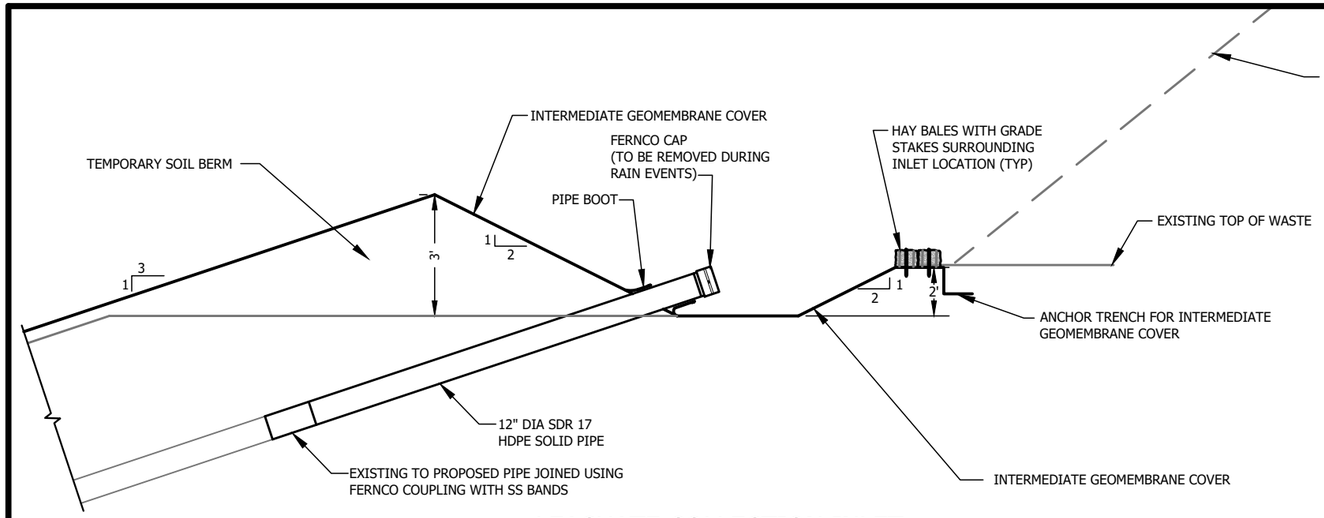
NTS

FIGURE 15-7
TYPICAL DEVELOPMENT DETAILS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

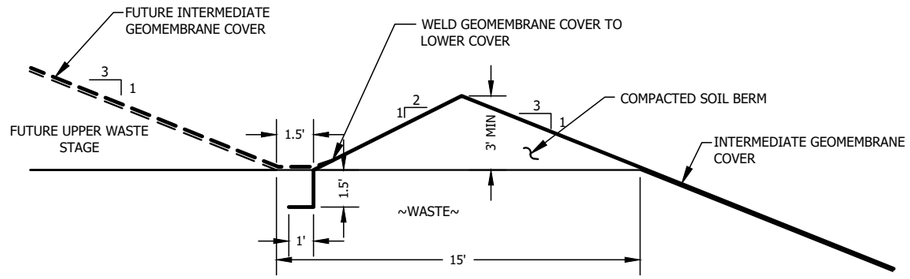
SME
SEVEE & MAHER
ENGINEERS

DWG: C15-CELLDEV-DETAILS LMN: NONE CTB: SME-STD REV: 1/13/2023

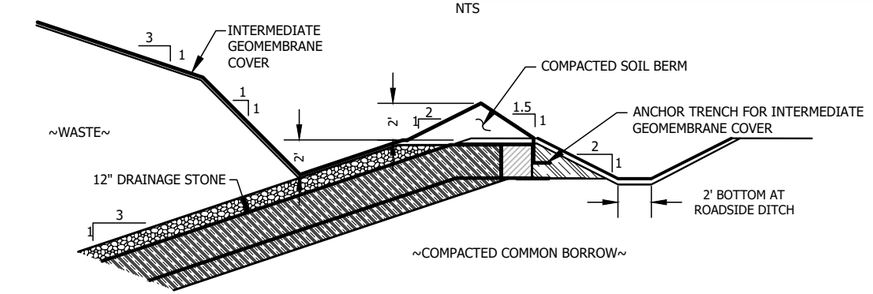
\\Server\cfs\Casella\OldTownLandfill\Cell15\Acad\Figures\C15-CELLDEV-DETAILS.dwg, FIG 15-7, 1/13/2023 2:10:35 PM, sjm



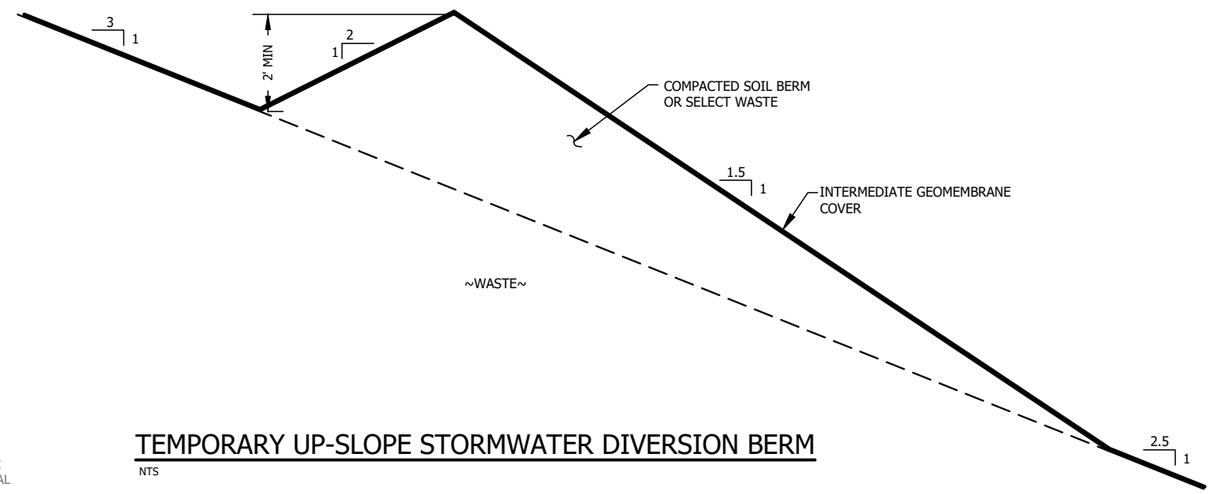
LEACHATE COLLECTION INLET
NTS



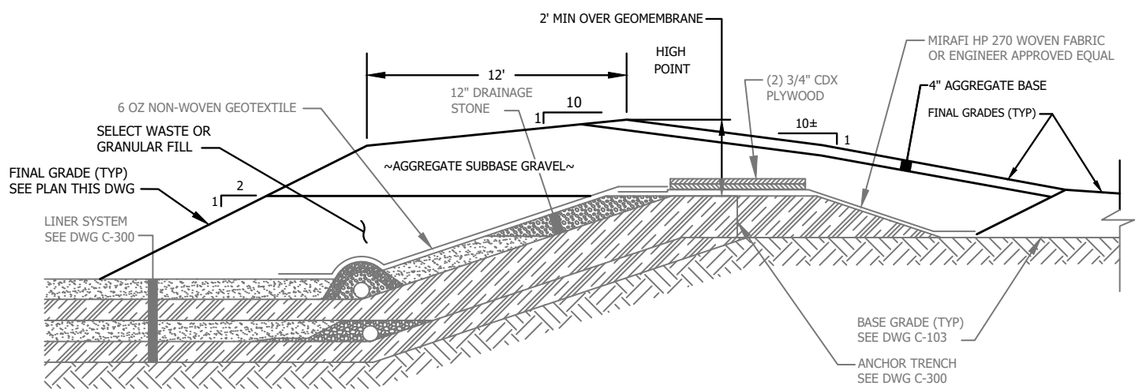
TEMPORARY MID-SLOPE INTERMEDIATE BERM
NTS



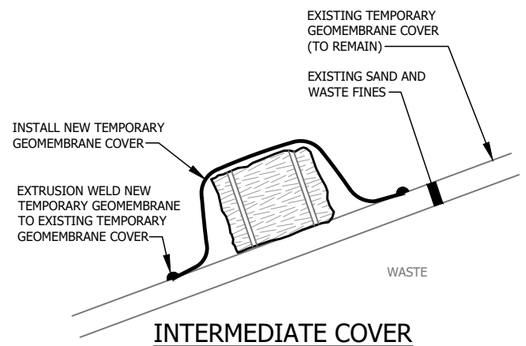
PERIMETER BERM INTERMEDIATE GEOMEMBRANE COVER DETAIL
NTS



TEMPORARY UP-SLOPE STORMWATER DIVERSION BERM
NTS



CELL 15 ACCESS RAMP
NTS



INTERMEDIATE COVER STORMWATER DIVERSION BERM
NTS

FIGURE 15-8
TYPICAL DEVELOPMENT DETAILS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

SME
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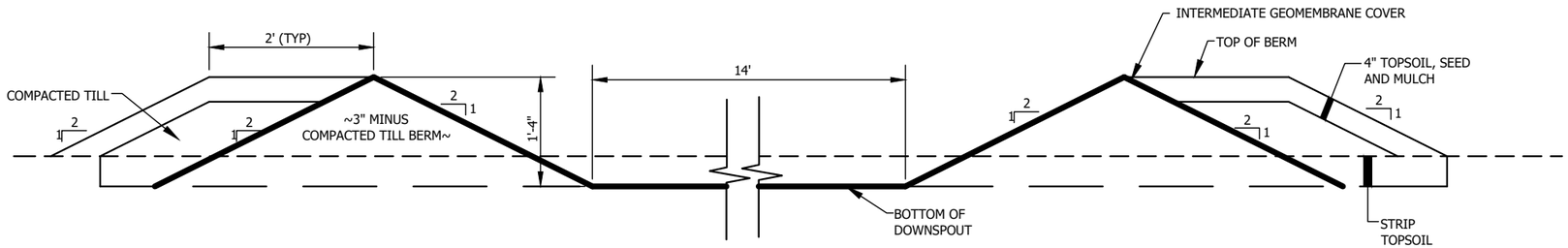
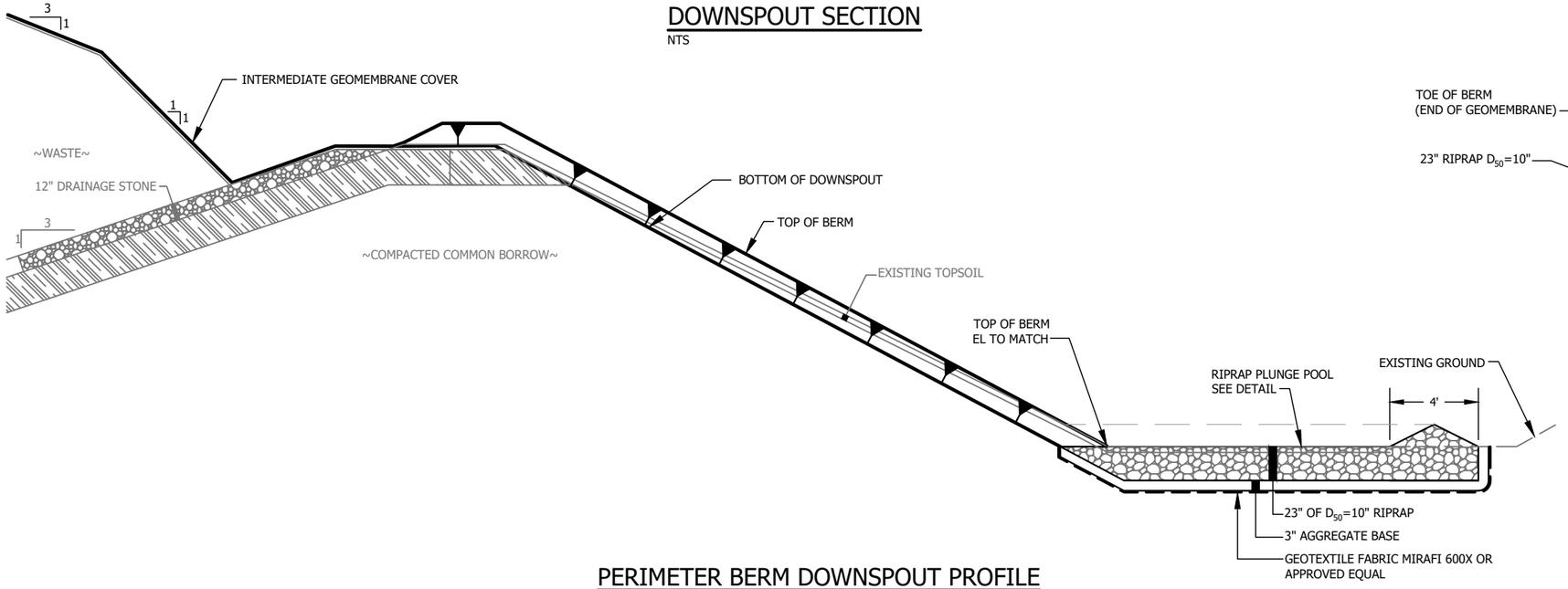
ENGINEERS

DWG: C15-CELLDEV-DETAILS LMN: NONE CTB: SME-STD REV: 1/13/2023

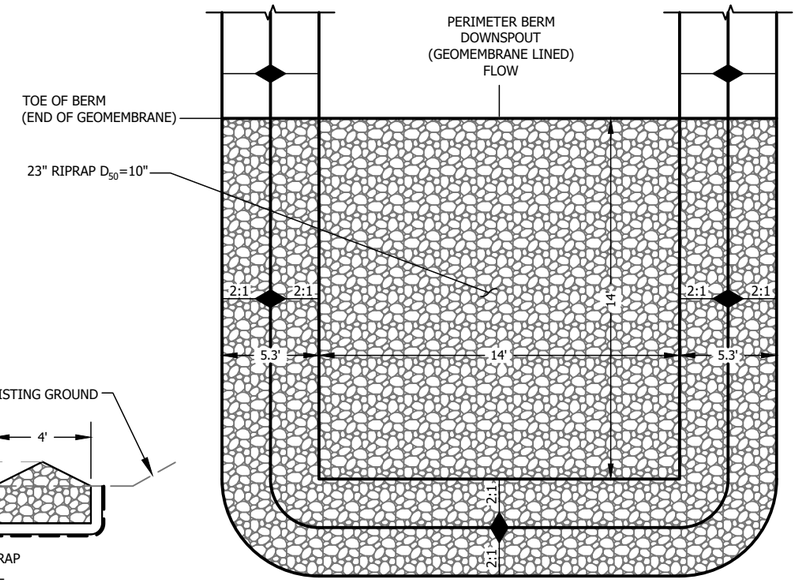
\\Server\cds\Casella\OldTown Landfill\Cell15\Acad\Figures\C15-CELLDEV-DETAILS.dwg, FIG 15-8, 1/13/2023 2:10:42 PM, sjm



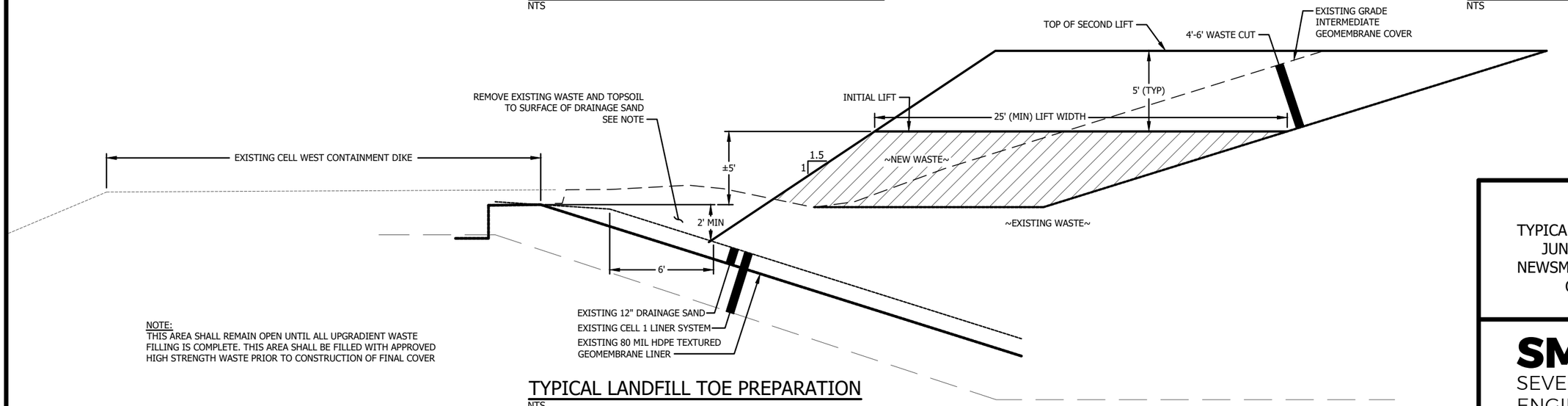
DOWNSPOUT SECTION
NTS



PERIMETER BERM DOWNSPOUT PROFILE
NTS



PLUNGE POOL
NTS



NOTE:
THIS AREA SHALL REMAIN OPEN UNTIL ALL UPGRADIENT WASTE FILLING IS COMPLETE. THIS AREA SHALL BE FILLED WITH APPROVED HIGH STRENGTH WASTE PRIOR TO CONSTRUCTION OF FINAL COVER

TYPICAL LANDFILL TOE PREPARATION
NTS

FIGURE 15-9
TYPICAL DEVELOPMENT DETAILS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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DWG: C15-CELLDEV-DETAILS LMN: NONE CTB: SME-STD REV: 1/13/2023

\\Nserver\cfs\Casella\OldTown\Landfill\Cell15\Acad\Figures\C15-CELLDEV-DETAILS.dwg, FIG 15-9, 1/13/2023 2:10:52 PM, sjm

Technical Specifications

Cell 15 Landfill Gas System Expansion

Juniper Ridge Landfill

Old Town, Maine

Prepared for

NEWSME Landfill Operations, LLC

Old Town, Maine

Prepared by

Sanborn, Head & Associates, Inc.

20 Foundry Street

Concord, New Hampshire

File 2536.36

February 2023

CONTENTS

DIVISION 2 - SITE WORK

Section 02560 - Landfill Gas Extraction Wells
Section 02565 - Landfill Gas Trenches

SECTION 02560

LANDFILL GAS EXTRACTION WELLS

PART 1 - GENERAL

1.1 SCOPE OF APPLICATION

A. Supply all equipment, materials, and labor needed to install landfill gas extraction wells as specified herein and as indicated on the Drawings.

1.2 SUBMITTALS

A. Submit to ENGINEER Certificates of Compliance on materials furnished, and manufacturer's brochures containing complete information and instructions pertaining to the storage, handling, installation, and inspection of pipe and appurtenances furnished.

B. Submit to ENGINEER well logs within 7 days of the completion of well installations.

C. The well logs shall depict a construction diagram for each well drilled, including the total depth of the well, the temperature of spoils, depth, thickness, and description of soil or waste strata, and the occurrence of any water bearing zones.

1.3 SITE CONDITIONS

A. Obstructions and saturated conditions such as sludges, and foundry sands are sometimes encountered when drilling in landfills, many of which can be drilled through. CONTRACTOR is expected to make reasonable effort to drill through obstructions and saturated conditions and will be paid for offset redrilling and boring abandonment only with prior written approval from OWNER.

B. Well drilling shall be performed on a level surface. CONTRACTOR shall provide a level surface at each drilling location as required. The size of the level area shall be acceptable to the drilling subcontractor. Any soil placed to level the drilling location shall be removed following well installation. If soil placed for leveling contacts refuse, it shall be disposed of in the active area of the landfill.

PART 2 - PRODUCTS

2.1 BALLAST STONE

A. Ballast Stone shall be hard, durable, and resistant to weathering and to water action, free from overburden, spoil, and organic materials. Ballast Stone shall be

washed, and uniformly blended according to the particle size distribution requirements shown below.

Sieve Size	Percent Passing by Weight
2-inch	100
1½-inch	90 - 100
1-inch	30 - 40
¾-inch	10 - 15
½-inch	0 - 5
⅜-inch	0 - 5

2.2 BENTONITE SEAL

A. Bentonite Seal shall be constructed using hydrated bentonite chips or pellets.

2.3 SAND/GRAVEL FILTER

A. Sand/Gravel Filter should conform to the following particle size distribution.

Sieve Size	Percent Passing by Weight
1½-inch	100
No. 4	70 - 100
No. 40	30 - 80
No. 200	0 - 15

2.4 COMMON FILL

A. Common Fill should be soil containing no stone larger than 4 inches, and shall have a maximum of 75 percent passing the No. 40 sieve and a minimum of 35 percent passing the No. 200 sieve.

2.5 PVC PIPE

A. Refer to Specification Section 15212.

2.6 WELLHEAD

A. Wellheads should be nominal 2-inch size QED Quick Change Orifice Plate wellhead, with elastomer adapter kits, or equivalent approved by OWNER. The wellhead components are indicated on the Drawings.

B. Wellhead and flow measurement tube shall be compatible with the CES/LANDTEC GEM-2000™ and GEM-5000™ Landfill Gas Monitors.

PART 3 - EXECUTION

3.1 DRILLING

A. ENGINEER shall observe all drilling operations.

B. Wells shall be drilled to the minimum diameter and the specific depths shown on the Drawings. CONTRACTOR shall drill the wells using bucket-type augers and dry drilling equipment; wet rotary drilling equipment may not be used.

C. Well depths shown on the Drawings are estimated based on projected top of waste elevations and may be adjusted in the field by ENGINEER. At no time shall the drilling extend deeper than the bottom of well screen elevation.

D. If water is encountered in a borehole, then CONTRACTOR may be directed to drill beyond the point that it was encountered. If wet conditions remain, then drilling may be terminated and the length of perforated pipe adjusted by ENGINEER, or the well may be relocated. If wet conditions cease (e.g., due to trapped water layer), then drilling will continue to the design depth.

E. As soon as drilling is completed, a safety screen shall be placed over the top of the borehole. This screen shall stay in place until backfilling is within 4 feet of the surface. Safety screen size should be large enough to accommodate all backfill materials and any tools used during backfill yet not large enough for any human to accidentally fall through.

F. Wells shall be drilled straight and plumb and the well pipe shall be installed in the center of the borehole. CONTRACTOR will take all compression off of the pipe by mechanical means and center the pipe in the middle of the borehole before starting to backfill.

G. PVC well pipe shall be solvent cemented and mechanically fastened with stainless steel fasteners.

3.2 BACKFILLING

A. Backfilling the borehole shall commence immediately after drilling is completed and the PVC pipe has been installed. Backfill materials shall be installed as indicated on the Drawings and as approved by ENGINEER.

B. Ballast Stone shall be poured or scooped through the safety screen at a rate that will not endanger the integrity of the well casing and limits the potential for bridging.

C. The Sand/Gravel Filter shall be poured through the safety screen until a layer at least 1-foot thick above the Ballast Stone is formed.

D. The Bentonite Seal will be formed by evenly distributing bentonite around the annulus of the well until a minimum plug thickness of 1 foot has been achieved.

E. Common Fill shall be rodded in the boring to provide even distribution and compaction.

3.3 DISPOSAL

A. Refuse from well drilling operations shall be hauled to the active face of the landfill operation the same day it is excavated.

[END OF SECTION 02560]

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SECTION 02565

LANDFILL GAS TRENCHES

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. CONTRACTOR shall provide all labor, materials, equipment, and incidentals necessary to excavate and backfill trenches for the landfill gas management system as shown on the Drawings and specified herein, including, but not limited to: excavation of waste; placement of soil, aggregate, and pipe; compaction of soil; and grading.

PART 2 – PRODUCTS

2.1 GENERAL

A. All soil, unless otherwise specified, shall consist of clean soil substantially free from organic materials, wood, trash, and other objectionable materials that may be compressible or that cannot be properly compacted. Soil shall not contain stone blocks, broken concrete, masonry rubble, or other similar materials. Soil shall have physical properties such that it can be readily spread and compacted to the specified density. Snow, ice, and frozen soil shall not be permitted.

B. Unless otherwise specified, the maximum soil particle size shall be no larger than two-thirds the loose lift thickness.

2.2 MATERIALS

A. Drainage Stone used as backfill shall be hard, durable, resistant to weathering, free from overburden, spoil, and organic materials. Drainage Stone shall be washed, and uniformly blended according to the following gradation requirements.

Sieve Size	**Percent (%) Passing by Weight**
2-inch	100
1½-inch	80-100
1-inch	50 – 85
½-inch	0 – 50
No. 4	0 – 15
No. 10	0 – 5

B. HDPE pipe and fittings refer to Specification Section 15210.

PART 3 - EXECUTION

3.1 GENERAL EXCAVATION BELOW GRADE

A. CONTRACTOR shall plan and perform earthwork activities to prevent damage to existing structures, safeguard people and property, minimize disruptions to site traffic, protect the structures to be installed, and provide safe working conditions in compliance with local safety regulations and provisions of the Occupational Safety and Health Act (OSHA).

B. Excavation shall be made to the elevations and dimensions shown on the Drawings. Excavate sufficient material to provide suitable room for construction providing bracing and support as required.

3.2 EXCAVATION IN WASTE

A. CONTRACTOR shall take safety precautions during construction activities that conform to all OSHA regulations and the safety requirements of OWNER and the Specifications.

B. Trenches shall be excavated to the depths, widths, and alignments shown on the Drawings.

C. CONTRACTOR shall separate cover soil from excavated refuse to the extent possible. Cover soil may be used to backfill trenches. Excavated material not suitable for use as soil shall be transported to the working face as directed by OWNER.

D. Pockets of perched leachate may be encountered during waste excavation activities. CONTRACTOR shall immediately notify OWNER and ENGINEER when leachate is encountered. ENGINEER will provide CONTRACTOR with directions on how to manage the leachate in narrative and/or drawing form. Potential leachate management techniques may include one or a combination of the following.
   1. Backfilling the affected area.
   2. Realigning the trench.
   3. Installing a French drain.

E. To the extent possible, the trench invert shall slope uniformly as indicated on the Drawings.

F. CONTRACTOR shall not excavate more trench than can be backfilled in one day after placement of the pipe. Excavations shall not be left open overnight.

3.3 BACKFILL

A. Excavated material shall be placed in loose layers and compacted to the extent possible with the goal of establishing a firm, even surface. The loose lift thickness shall not exceed 12 inches.

B. ENGINEER does not have to be present, and does not supervise or direct the actual Work by CONTRACTOR, his/her employees, or agents. Neither the presence of ENGINEER nor any observations and testing performed by ENGINEER shall excuse CONTRACTOR from defects discovered in their Work.

[END OF SECTION 02565]

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CONTENTS

DIVISION 15 - MECHANICAL

Section 15210 – High-Density Polyethylene Pipe (HDPE), Fittings, and Appurtenances

Section 15212 - Polyvinyl Chloride (PVC) Pipe and Fittings

SECTION 15210

HIGH DENSITY POLYETHYLENE (HDPE) PIPE, FITTINGS, AND APPURTENANCES

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Furnish and install HDPE pipe and fittings for the landfill gas extraction system.

B. Pressure test HDPE pipe.

1.2 DELIVERY, STORAGE, AND HANDLING

A. The pipe and fitting manufacturer shall package products for shipment in a manner suitable for safe transport by commercial carrier. When delivered, CONTRACTOR shall inspect the shipment and report any damage to the pipe and fittings manufacturer. Pipe and fittings shall be handled, installed, and tested in accordance with manufacturer's recommendations, and the requirements of this Section.

B. Pipe Storage:
   1. Store or stack pipe to prevent damage from marring, crushing or puncture. Limit maximum stacking height to 6 feet or manufacturer's recommended maximum height, whichever is less.
   2. Store in accordance with manufacturer's recommendations.

C. Pipe Handling:

   1. Protect pipe from excessive heat or harmful chemicals.
   2. Handle pipe and use equipment needed to avoid gouging of the pipe surfaces.

PART 2 - PRODUCTS

2.1 PHYSICAL PROPERTIES:

A. Materials used for the manufacture of PE pipe and fittings shall meet the following physical property requirements:

Property	Unit	Test Procedure	Value
Material Designation	-	PPI/ASTM	-
PPI Material Listing	-	PPI TR-4	PE 4710
Cell Classification	-	ASTM D3350	445474C
Density	g/cm3	ASTM D1505	>0.941
Melt Index [E]	g/10 min	ASTM D1238	<0.15
Flexural Modulus	psi	ASTM D790	110,000 and <160,000 3000 to 3500
Tensile Strength	psi	ASTM D638	>100
PENT	hours	ASTM F1473	1600 at 23^{O} C
HDB	psi	ASTM D2837	2 to 3
UV Stabilizer [C]	% Carbon Black	ASTM D1603	
	psi		110,000
Elastic Modulus	^{o}F	ASTM D638	<-180
Brittleness Temperature	^{o}F	ASTM D746	255
Vicat Softening Temperature		ASTM D1525	
Thermal Expansion	in/in/ ^{o}F		8 x 10E-5
Hardness	Shore D	ASTM D696	64
Molecular Weight Category	-	ASTM D2240	Extra High
		-	

B. There shall be no evidence of splitting, cracking, or breaking when the pipe is tested.

C. Ring Stiffness Constant (RSC) values for the pipe shall be 90 percent of the nominal.

D. The pipe and fittings shall be homogenous throughout and free from visible cracks, holes, foreign inclusions, or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density, and other physical properties.

E. Clean rework or recycled material generated by the manufacturer's own production may be used so long as the pipe or fittings produced meet all the requirements of this Section.

2.2 PIPE AND FITTINGS

A. Dimensions:
   1. Pipe Dimensions: The nominal inside diameter of the pipe shall be true to the specified pipe size in accordance with ASTM D2513. Standard laying lengths shall be 40 feet $\pm$ 2 inches.
   2. Fitting Dimensions: Fittings such as couplings, wyes, tees, adaptors, etc. for use in laying pipe shall have standard dimensions that conform to ASTM D3261.
   3. Pipe shall be SDR-17. Fitting shall be SDR-11 or SDR-17.

B. Pipe and fittings shall be produced from identical materials meeting the requirements of this Section. Special or custom fittings may be exempted from this requirement.

C. Pipe and fittings shall be pressure rated to meet the service pressure requirements specified. Fittings shall be fully pressure rated to at least the same service pressure rating as the joining pipe.

D. Molded fittings shall meet the requirements of ASTM D3261 and this Section. At the point of fusion, the outside diameter and minimum wall thickness of fitting butt fusion outlets shall meet the diameter and wall thickness specifications of the mating system pipe. Fitting markings shall include a production code that identifies the location and date of manufacture. Upon request, the manufacturer shall provide an explanation of his production code.

E. Marking:
   1. Each standard and random length of pipe and fitting shall be clearly marked with the following information:
      a. Manufacturer's Name or Trademark;
      b. ASTM Standard Designation;
      c. Nominal Pipe Size;
      d. Class & Profile Number;
      e. Production Code, including Extrusion Date, and Lot or Batch Number; and
      f. Standard Dimension Ratio.

F. The pipe and fitting manufacturer shall certify that samples of production pipe have undergone stress regression testing, evaluation, and validation in accordance with ASTM D2837 and PPI TR-3. Under these procedures, the minimum hydrostatic design basis shall be certified by the pipe and fitting manufacturer to be 1600 psi at 73.4° F and 800 psi at 140° F.

G. Material shall be listed in the name of the pipe and fitting manufacturer by the Plastics Pipe Institute (PPI) in PPI TR-4 with the following Standard Grade ratings:

		73.4° F	140° F
1.	Hydrostatic Design Basis (HDB)	1,600 psi	800 psi
2.	Hydrostatic Design Stress (HDS)	800 psi	400 psi

H. PPI material listing in the name of the resin supplier is not acceptable in meeting this requirement.

I. Certification:
   1. As the basis of the acceptance of the material, the manufacturer shall furnish a certificate of conformance of this Section upon request. When prior agreement is being made in writing between CONTRACTOR and the

manufacturer, the manufacturer shall furnish other conformance certification in the form of affidavit of conformance, test results, or copies of test reports.

2.3 GASKETS AND HARDWARE

A. All gaskets shall be Viton or other similar materials approved by OWNER. Joint hardware shall be Type 304 stainless steel.

2.4 FITTINGS

A. Fittings shall be manufactured from polyethylene compound having cell classification equal to or exceeding compound used in pipe to ensure compatibility of polyethylene resins.

B. Dimensions of fittings conforming to standard dimensions and tolerances in accordance with ASTMD 3261.

C. Fittings shall have the same or higher pressure rating as pipe.

D. Markings:
1. Manufacturer's name or trademark.
2. Nominal size.
3. Type of plastic pipe (i.e., PE 4710).
4. Standard dimension ratio.
5. Extrusion date, lot number or batch number.

E. The Drawings do not show all fittings that may be required. Provide all fittings required for a complete installation.

PART 3 – EXECUTION

3.1 FIELD QUALITY CONTROL

A. Pipe may be rejected for failure to conform to any of the following:
1. Fractures or cracks passing through pipe wall, except single crack not exceeding 2 inches in length at either end of pipe, which may be cut off and discarded. All pipes within one shipment shall be rejected if defects exist in more than five percent of shipment or delivery.
2. Cracks sufficient to impair strength, durability, or service ability of pipe.
3. Defects indicating improper proportioning, mixing, and molding.
4. Damaged ends, where such damage prevents making satisfactory joint.
5. Damage due to handling or installation. Scratches and gouges exceeding five percent of the wall thickness shall be considered excessive, and may be rejected by ENGINEER or OWNER.

B. Acceptance of fittings, stubs, or other specially fabricated pipe sections shall be based on visual inspection by ENGINEER and documentation of conformance to this Section.

C. Prior to backfilling trench CONTRACTOR shall obtain as-built top of pipe coordinates and elevations at grade changes, terminations, fittings, and at least every 50 feet along the pipe.

3.2 INSTALLATION

A. Trench, backfill, and compact in accordance with Specification Section 02565.

B. Heat Fusion of Pipe:

1. Weld pipe in accordance with manufacturer's recommendation for butt fusion methods. The pipe manufacturer shall certify fusion machine operators.
2. Butt fusion equipment for joining procedures shall be capable of meeting conditions recommended by pipe manufacturer including, but not limited to, temperature, alignment, and fusion pressures.
3. Branch saddle fusions shall be joined in accordance with manufacturer's recommendations and procedures. Branch saddle fusion equipment shall be of a size to facilitate saddle fusion within the trench.
4. For cleaning pipe ends, solutions such as detergents and solvents, when required, shall be used in accordance with manufacturer's recommendations. Solvents shall not be used unless approved by OWNER.
5. Do not bend pipe to greater degree than minimum radius recommended by manufacturer for type and grade.
6. Do not subject pipe to strains that will overstress or buckle pipe or impose excessive stress on joints.
7. Before butt fusing pipe, observe inside of each pipe length for presence of dirt, sand, mud, shavings, and other debris or animals. Remove debris from pipe prior to fusing.
8. Cap open ends of fused pipe at end of each working day to prevent entry by animals, debris, or stormwater.
9. Use compatible fusion techniques when polyethylenes of different melt indexes are fused together. Refer to manufacturer's specifications for compatible fusion.

C. Flange Jointing:
1. Use on flanged pipe connection sections.
2. At a minimum convoluted stainless steel backup rings shall be used for joining HDPE pipes below grade, and epoxy-coated carbon steel backup flanges shall be used above grade, unless stainless steel is specified by OWNER.
3. Butt fuse fabricated flange adapters to pipe or use electrofusion couplings.
4. Observe the following precautions in connection of flange joints:

a. Use full-face gaskets only.
b. All fasteners and back-up rings shall be Type 18-8 or Type 304 stainless steel below grade, and zinc-plated steel above grade.
c. Align flanges or flange/valve connections to provide tight seal.
d. U.S. Standard round washers may be used on some flanges when in accordance with manufacturer's recommendations. Bolts shall be lubricated prior to installation.

5. Protect below grade bolts and flanges by covering with a 6-mil thick PE wrap. Duct tape wrap to HDPE pipe.
6. Electrofusion couplers, where used, shall be installed per manufacturer's specifications. The outside diameter of the HDPE pipe and face shall be prepared in accordance with manufacturer's recommendations prior to installing the coupler.

D. Pipe Placement:
1. Grade control equipment shall be of the type to accurately maintain design grades and slopes during installation of pipe.
2. Unless otherwise specifically stated, install pipe in accordance with manufacturer's recommendations.
3. Maximum lengths of fused pipe to be handled as one section shall not exceed 400 feet and shall be placed according to the manufacturer's recommendations as to pipe size, pipe SDR, and topography so as not to cause excessive gouging or surface abrasion. Pipe wall gouges deeper than 3/16-inch may be cause for rejection of the pipe.
4. Cap pipe sections longer than single joint (usually 40 feet) on both ends during placement except during fusing operations.
5. Remove dirt or debris from inside of pipe before backfilling.
6. Notify ENGINEER prior to installing pipe into trench and allow time for observation. CONTRACTOR shall correct irregularities identified during observation.
7. Complete connections within trench whenever possible to prevent overstressed connections.
8. Allow pipe sufficient time to adjust to trench temperature prior to testing, fusion welding, making segment connections, or backfilling activity.
9. To reduce branch saddle stress, install saddles at slope equal to and continuous with connecting pipe.
10. Install reducers adjacent to laterals and tees unless directed otherwise.
11. Place pipe system in trench allowing at least 12 in./100 ft. for thermal contraction and expansion.

3.2 PIPE TESTING

A. CONTRACTOR shall perform a pneumatic test of the non-perforated pipe and fittings, with the exception of the 50-feet of solid pipe installed in the horizontal collection trenches, after placement in the trench, in accordance with manufacturer's recommendations.

B. Pipes shall be pressure tested in presence of ENGINEER. Provide adequate notice to ENGINEER before performing test.

C. Pneumatic testing shall be performed as follows:
   1. The test period at the test pressure shall last no more than 10 minutes.
   2. Provide all necessary connections, bulkheads, flanges, bracing, and blocking, as well as all required test equipment.
   3. Test pressure gauge shall have a recommended range of 20 psig, with minor gradations no greater than 0.1 psig.
   4. Pipe to be tested shall be exposed in the trench, except bends, reduced pressure rated fittings and components, which shall be buried or restrained. Flange connections shall be visible to check for leaks.
   5. Test pressure shall be 10 psig.
   6. Acceptance
      a. Test shall be accepted if the pressure drop over 10 minutes is less than 5 percent of the pressure at the beginning of the test period.

D. Test Report
   1. ENGINEER shall prepare and submit to OWNER a test report using the attached forms for each pipe system tested. Include following information in test report.
      a. Date of test.
      b. Description and identification of pipe system tested.
      c. Type of test performed.
      d. Test fluid.
      e. Test pressure.
      f. Results of test.
      g. Type and location of leaks detected.
      h. Corrective action taken to repair leaks.
      i. Results of retesting.
      j. Name of person performing test.

[END OF SECTION 15210]

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ATTACHMENT 1 TO SECTION 15210
PIPE PRESSURE AIR TEST LOG

SANBORN HEAD		Project No.:	
		Project Name:	
		Project Location:	
		Weather:	
Contractor:		Test No.:	
CQA Personnel:		Person/Company Performing the Test:	
Date of Test:		Time of Test:	Finish:
Pipe Length: ~ ft.	Pipe Diameter: in.	Pipe Material:	Pipe SDR/Sch.:
Rated Working Pressure:		Test Pressure: psi	
Location/designation of pipe tested:			

t Time (min.)	T Pipe Temperature (ºC)	P_t Pressure Gauge Reading (psig)	P_c Pressure Drop (%)
0			
5			
10			
15			
30			
60			

Pass	Fail	Retest?	Yes	No

Description of leaks and repairs of retested pipe segments:

P_c = Percent Pressure Drop $\frac{P_o - P_t}{P_o} \times 100$

P_o = Initial Pressure Gauge Reading

P_t = Pressure Gauge Reading at Time *t*

Comments:

Signature:

P:\2500s\2536.36\Source Files\Cell 15 Tech Specs\Divison 15\15210.doc

SECTION 15212

POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Supply polyvinyl chloride (PVC) Schedule 80 pipe and fittings as shown on the Drawings.

1.2 SUBMITTALS

A. Submit to ENGINEER manufacturer's technical product data and installation instructions for PVC pipe and fittings.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Pipe and fittings shall be manufactured from a PVC compound which meets the requirements of Cell Classification 12454-B PVC as outlined in ASTM D1784.

B. PVC pipe used in the construction of landfill gas extraction system shall meet the requirements of ASTM D1784 and ASTM D1785 for Schedule 80 PVC pipe.

C. PVC fittings used in the construction of landfill gas extraction system shall meet the requirements of ASTM D2464 and ASTM D2467.

D. All PVC cements shall meet the requirements of ASTM D2564 for solvent cemented PVC joints.

E. Clean rework or recycle material generated by the manufacturer's own production may be used so long as the pipe or fittings produced meet all the requirements of this Section.

F. Fittings shall be industrial, heavy duty, hub style.

G. Socket fittings shall be pressure rated the same as the corresponding size pipe prescribed by ASTM D1785. Threaded fittings shall be pressure rated to at least 50 percent of the rating for socket fittings.

2.2 FLANGES

A. Flanges shall be one piece solid design or two-part Van Stone type that use the tapered, serrated face and full face gasket technique for joining and are compatible with ANSI B16.5 Class 150 metal flanges.

B. Flanges shall be pressure rated at 150 psi for water service at 73°F, non-shock and have a minimum burst requirement of 3.3 times the rated pressure.

C. Bolts shall be zinc-plated ASTM A193, Grade B8M hex head, and nuts shall be zinc-plated ASTM A194, Grade 8M hex head.

D. Gaskets shall be ⅛-inch thick, full face Viton or other similar materials approved by OWNER.

PART 3 - EXECUTION

3.1 PVC PIPE HANDLING

A. PVC pipe and pipe fittings shall be handled carefully in loading and unloading. They shall be lifted by hoists and lowered on skidways in such a manner as to avoid shock. Derricks, ropes, or other suitable equipment shall be used for lowering the pipe into well borings. Pipe and pipe fittings shall not be dropped or dumped.

3.2 PVC PIPE INSTALLATION

A. PVC pipe installation shall conform to the requirements of this Section, the manufacturer's recommendations, and as outlined in ASTM D2774V.

3.3 JOINING OF PVC PIPES

A. Pipes shall be joined in accordance with ASTM D2855.

B. Pipe shall be inspected for cuts, scratches, or other damages prior to installation. Pipe with imperfections shall not be used.

C. Burrs, chips, etc., shall be removed from pipe interior and exterior.

D. Loose dirt and moisture shall be wiped from the interior and exterior of the pipe end and the interior of the fitting.

E. Pipe cuts shall be square and perpendicular to the center line of pipe.

F. A coating of CPS primer, as recommended by pipe supplier, shall be applied to the entire interior surface of the fitting socket, and to an equivalent area on the exterior of the pipe prior to applying solvent cement.

G. The solvent cement shall comply with the requirements of ASTM D2564 and shall be applied in strict accordance with manufacturer's specifications.

H. Pipe and pipe fittings shall be selected so that there will be as small a deviation as possible at the joints, and so that inverts present a smooth surface. Pipe and fittings that do not fit together to form a tight fitting shall be rejected.

[END OF SECTION 15212]

P:\2500s\2536.36\Source Files\Cell 15 Tech Specs\Divison 15\15212.doc

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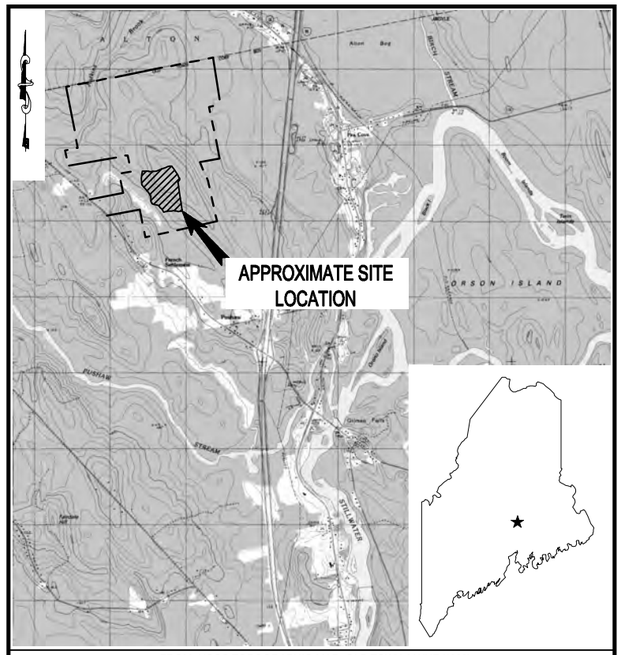
CELL 15 LANDFILL GAS SYSTEM EXPANSION DRAWINGS

JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE
FEBRUARY 2023



FROM: USGS TOPOGRAPHIC MAP- OLD TOWN, MAINE (1988)

LOCUS PLAN

SCALE: 1"=1000'

SHEET INDEX

SHEET 1	OVERALL SITE PLAN
SHEET 2	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 1
SHEET 3	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 2
SHEET 4	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 3
SHEET 5	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 4
SHEET 6	LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 5
SHEET 7	CROSS-SECTION
SHEET 8-13	DETAILS

STATE OF MAINE
RYAN L. CLAY
16411
LICENSED PROFESSIONAL ENGINEER

ISSUED FOR MAINE DEP APPROVAL AND CONSTRUCTION
FEBRUARY 2023

PREPARED FOR:

NEWSME LANDFILL OPERATIONS, LLC

JUNIPER RIDGE LANDFILL

OLD TOWN, MAINE

PREPARED BY:

SANBORN HEAD

20 FOUNDRY STREET, CONCORD, NEW HAMPSHIRE 03301
(603) 229-1900 FAX (603) 229-1919

PROJ.#: 2536.36 "CELL 15 LANDFILL GAS SYSTEM EXPANSION DRAWINGS, JUNIPER RIDGE LANDFILL, OLD TOWN, MAINE," DATED FEBRUARY 2023.

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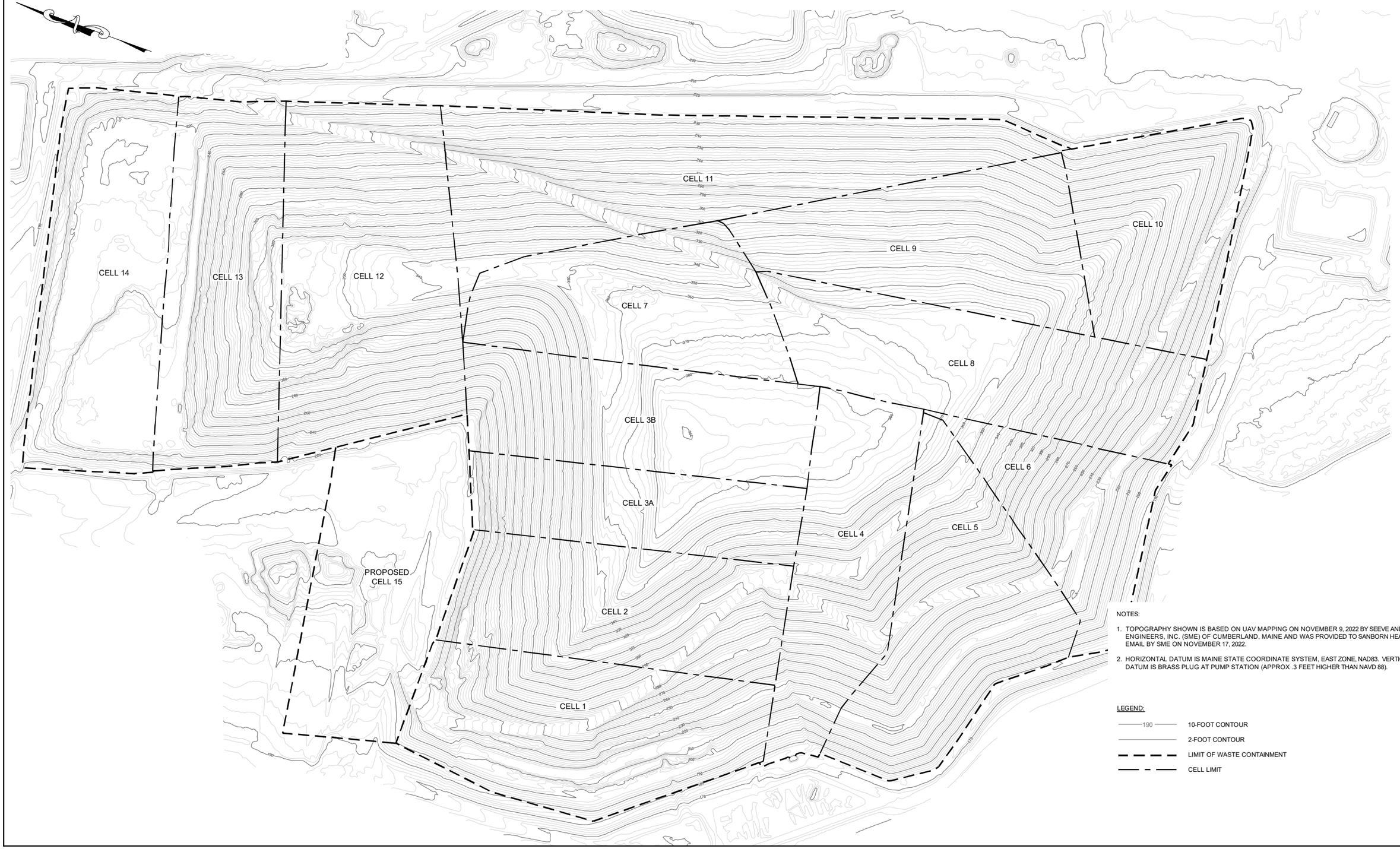

NOTES:

1. TOPOGRAPHY SHOWN IS BASED ON UAV MAPPING ON NOVEMBER 9, 2022 BY SEEVE AND MAHER ENGINEERS, INC. (SME) OF CUMBERLAND, MAINE AND WAS PROVIDED TO SANBORN HEAD VIA EMAIL BY SME ON NOVEMBER 17, 2022.
2. HORIZONTAL DATUM IS MAINE STATE COORDINATE SYSTEM, EAST ZONE, NAD83. VERTICAL DATUM IS BRASS PLUG AT PUMP STATION (APPROX .3 FEET HIGHER THAN NAVD 88).

LEGEND:

- 190 — 10-FOOT CONTOUR
- 2-FOOT CONTOUR
- LIMIT OF WASTE CONTAINMENT
- CELL LIMIT

SANBORN HEAD

GRAPHICAL SCALE
120' 60' 0' 120' 240'

STATE OF MAINE
RYAN L. CLAY
16411
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.36

OVERALL SITE PLAN

SHEET NUMBER: 1 OF 13

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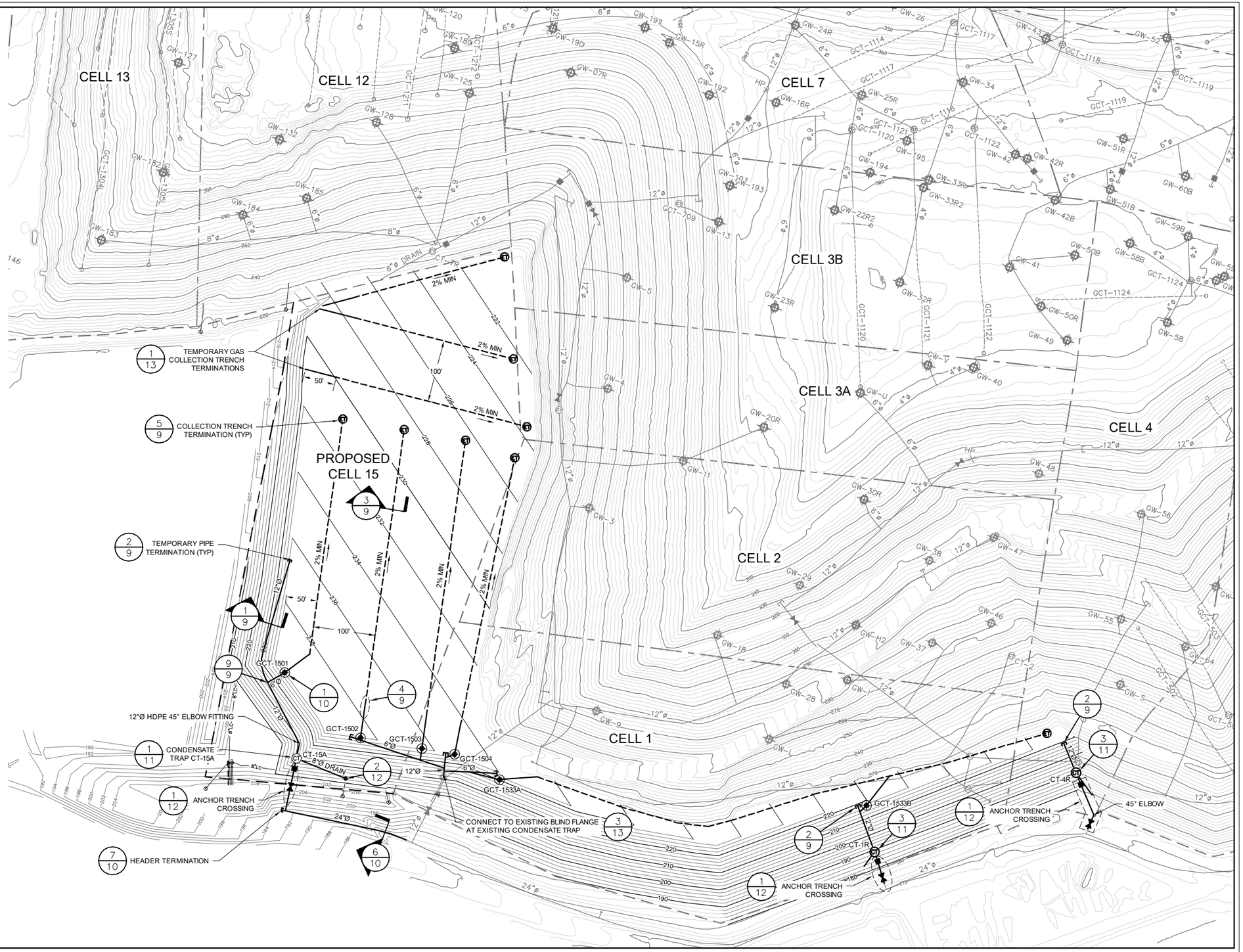
NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 15 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON DECEMBER 20, 2022.
3. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
4. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
5. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
6. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-198
	COLLECTION TRENCH WELLHEAD	GCT-1502
CT	COLLECTION TRENCH TERMINATION	CT
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	



SANBORN HEAD

GRAPHICAL SCALE
80' 40' 0' 80' 160'

STATE OF MAINE
RYAN L CLAY
16411
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 1

PROJECT NUMBER: 2536.36

SHEET NUMBER: 2 OF 13

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NOTES:

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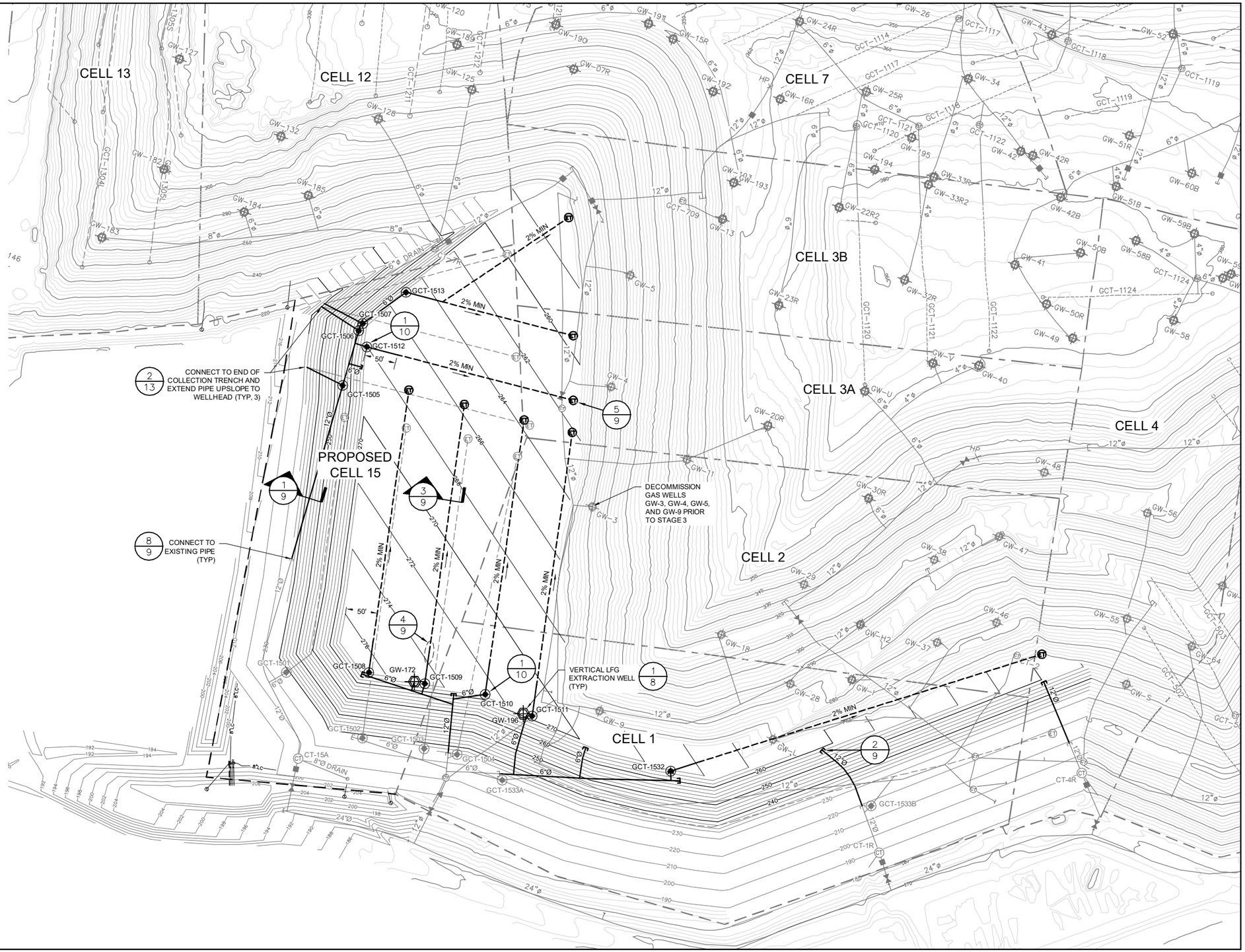
3. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
4. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
5. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
6. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-198
	COLLECTION TRENCH WELLHEAD	GCT-1502
	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	



SANBORN HEAD

GRAPHICAL SCALE
80' 40' 0' 80' 160'

STATE OF MAINE
RYAN L. CLAY
16411
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 2

PROJECT NUMBER: 2536.36

SHEET NUMBER: 3 OF 13

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NOTES:

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LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
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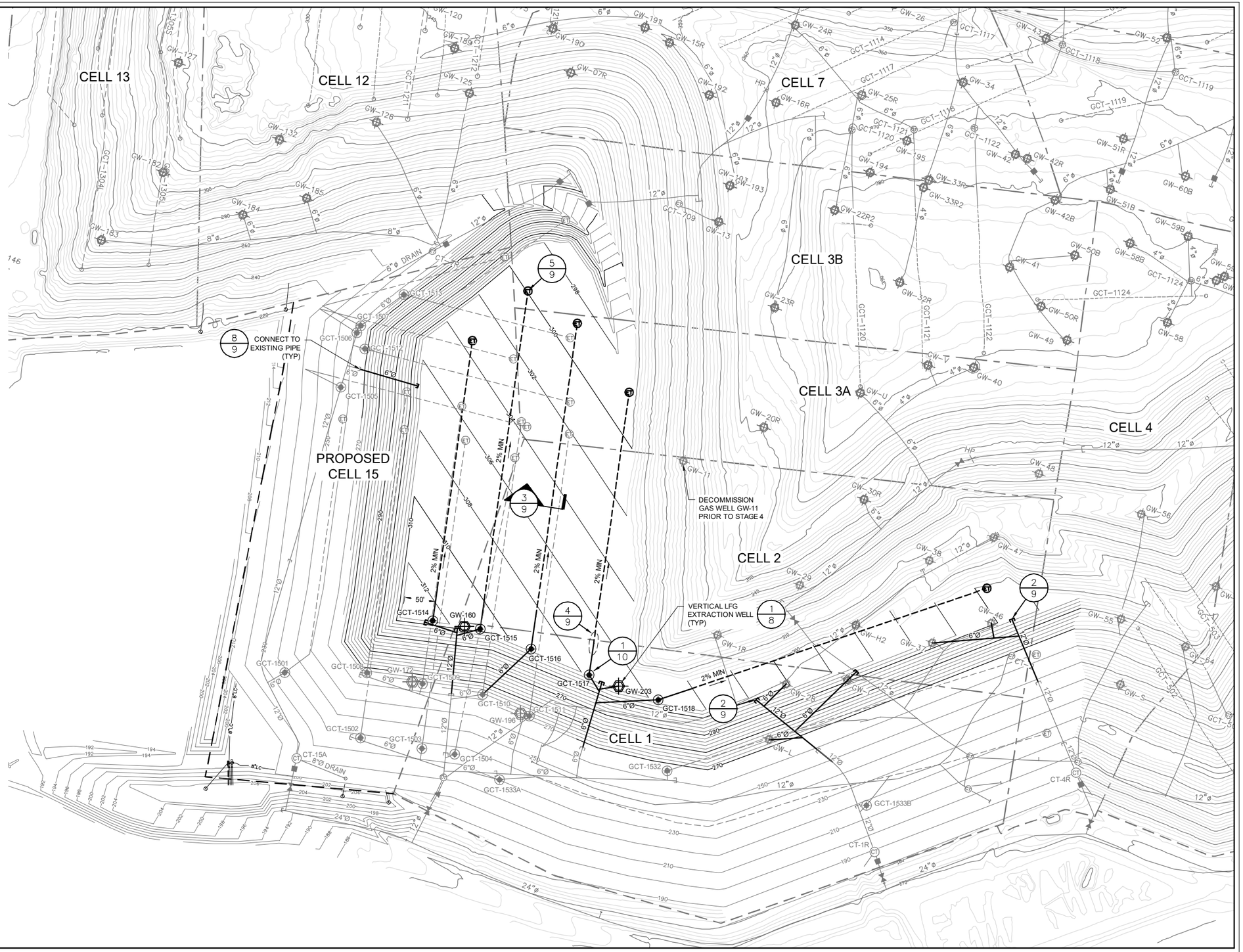
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	



SANBORN HEAD

GRAPHICAL SCALE
80' 40' 0' 80' 160'

STATE OF MAINE
RYAN L CLAY
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LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.36

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 3

SHEET NUMBER: 4 OF 13

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LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
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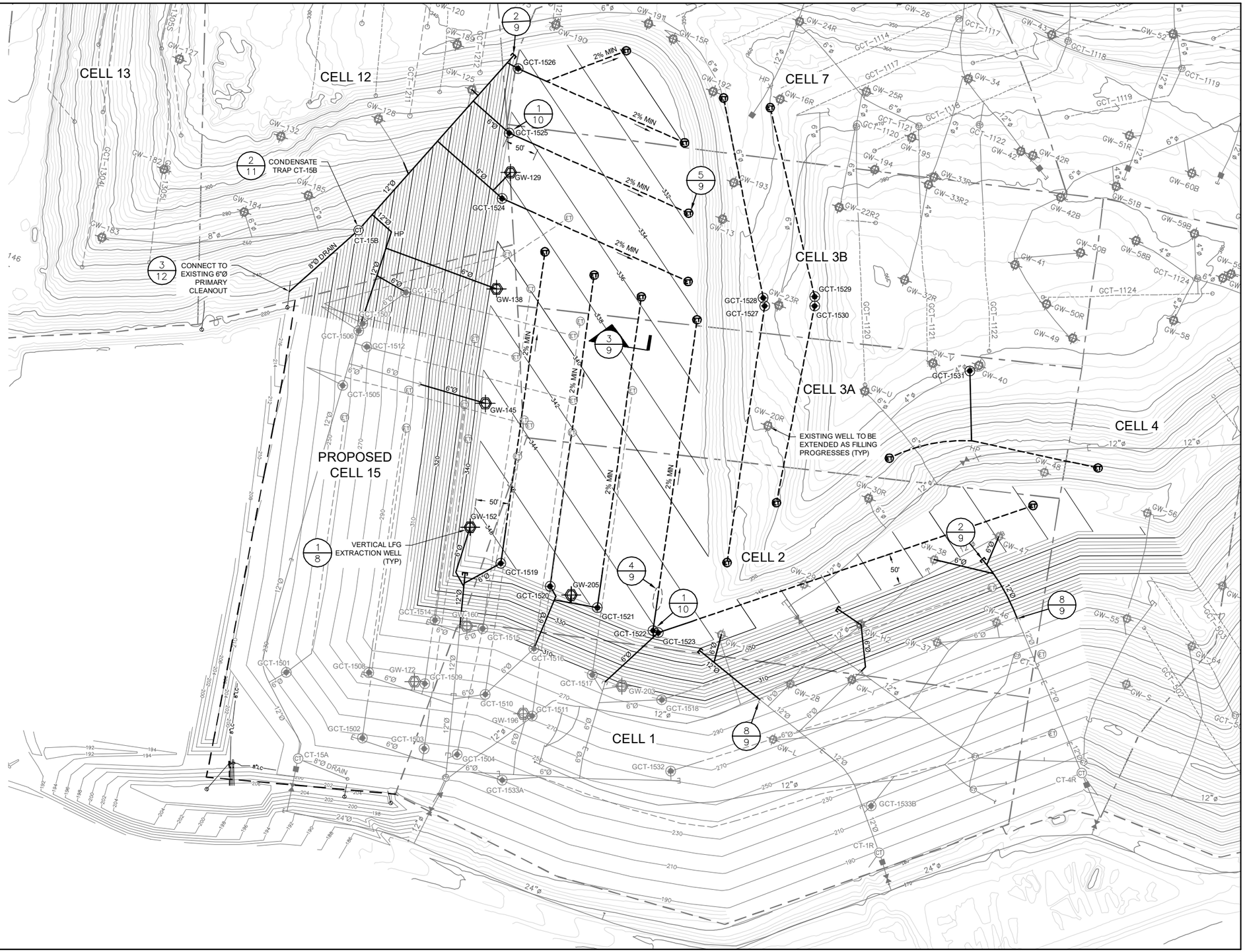
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	



SANBORN HEAD

GRAPHICAL SCALE
80' 40' 0' 80' 160'

STATE OF MAINE
RYAN L. CLAY
16411
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 4

PROJECT NUMBER: 2536.36

SHEET NUMBER: 5 OF 13

FILE: P:\2500s\2536.36\Graphics\Final\ACAD\Cell 15 LFG Design\P2 - 07 - Development Plans.dwg
LAYOUT: 05 - STAGE 4
USER: rday
PLOTDATE: 2/4/23 - 1:08 PM

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NOTES:

1. REFER TO SHEET 1 FOR ADDITIONAL NOTES AND LEGEND.
2. PROPOSED GRADES FOR CELL 15 WERE PROVIDED ELECTRONICALLY BY SEVEE & MAHER, (SME) INC. OF CUMBERLAND, MAINE ON DECEMBER 20, 2022.
3. ACTUAL LOCATIONS OF PROPOSED INFRASTRUCTURE MAY CHANGE BASED ON SITE CONDITIONS AT TIME OF CONSTRUCTION.
4. SOLID LANDFILL GAS CONVEYANCE PIPE SHALL BE INSTALLED AT A MINIMUM SLOPE OF 5 PERCENT. PERFORATED LANDFILL GAS COLLECTION TRENCHES SHALL BE INSTALLED AT A MINIMUM SLOPE OF 2 PERCENT.
5. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR-11 OR SDR-17.
6. THE EXISTING LANDFILL GAS EXTRACTION SYSTEM INFRASTRUCTURE FEATURES SHOWN ARE BASED ON A COMBINATION OF DESIGN AND AS-BUILT DOCUMENTATION AVAILABLE TO SANBORN, HEAD & ASSOCIATES, INC. (SANBORN HEAD). ACTUAL LOCATIONS OF INDIVIDUAL FEATURES MAY BE DIFFERENT THAN SHOWN.

LEGEND:

EXISTING		PROPOSED
190	10-FOOT CONTOUR	190
	2-FOOT CONTOUR	
	LIMIT OF WASTE CONTAINMENT	
	CELL LIMIT	
	EDGE OF ROAD	
	LANDFILL GAS CONVEYANCE PIPE	
	LANDFILL GAS COLLECTION TRENCH (PERFORATED PIPE)	
GW-23R	LANDFILL GAS EXTRACTION WELL	GW-198
	COLLECTION TRENCH WELLHEAD	
CT	COLLECTION TRENCH TERMINATION	
	PIPE END CAP	
	LEACHATE COLLECTION PIPE CLEANOUT	
	VERTICAL RISER	
	TEE PIPE CONNECTION STUB	
HP	HIGH POINT	
	ROAD CROSSING CULVERT	
	ISOLATION VALVE	

CELL 13
CELL 12
CELL 7
CELL 3B
CELL 3A
CELL 4
CELL 2
CELL 1
PROPOSED CELL 15

CONNECT TO VACUUM SOURCE AT EXISTING WELL
EXTEND NEW VACUUM TO EXISTING WELL (TYP)
VERTICAL LFG EXTRACTION WELL (TYP)

SANBORN HEAD

GRAPHICAL SCALE
80' 40' 0' 80' 160'

STATE OF MAINE
RYAN L. CLAY
16411
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

LFG INFRASTRUCTURE DEVELOPMENT PLAN - STAGE 5

PROJECT NUMBER: 2536.36

SHEET NUMBER: 6 OF 13

FILE: P:\2536\26536-NG\Graphics\Revit\ACAD\cell 15 LFG Dwg\GP2 - GP - Development Plans.dwg
LAST SAVED BY: RYAN.CLAY
USER: rclay
PLOT DATE: 2-6-23 2:08 PM

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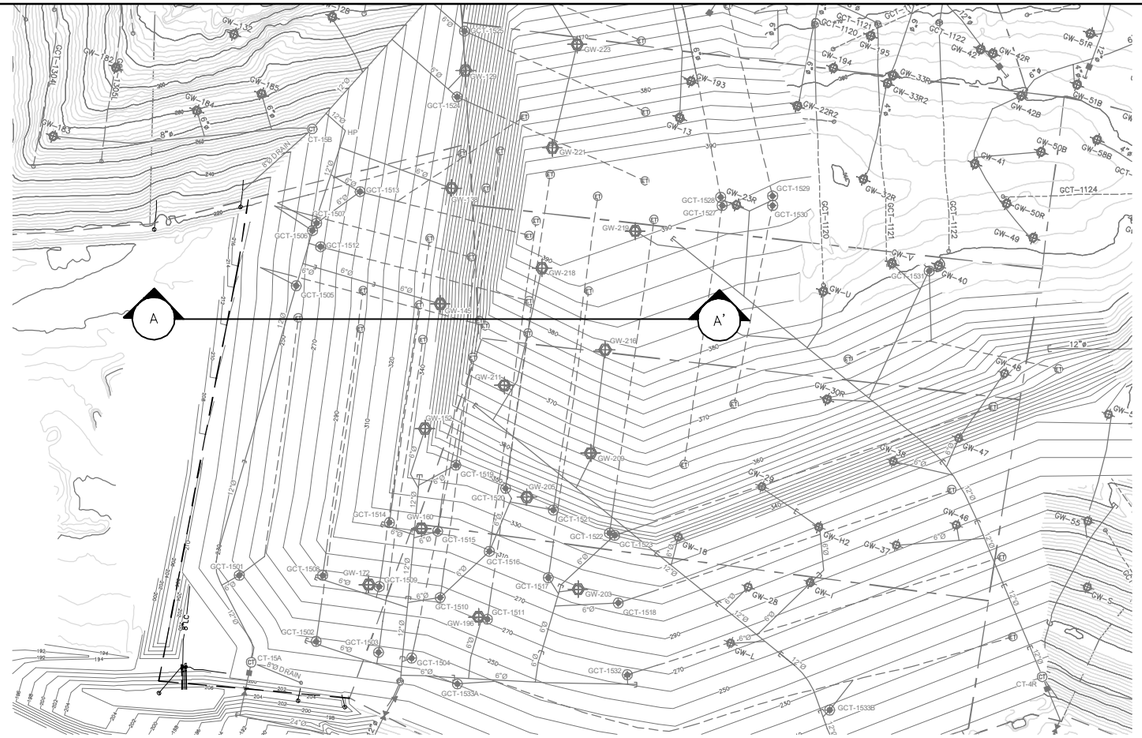
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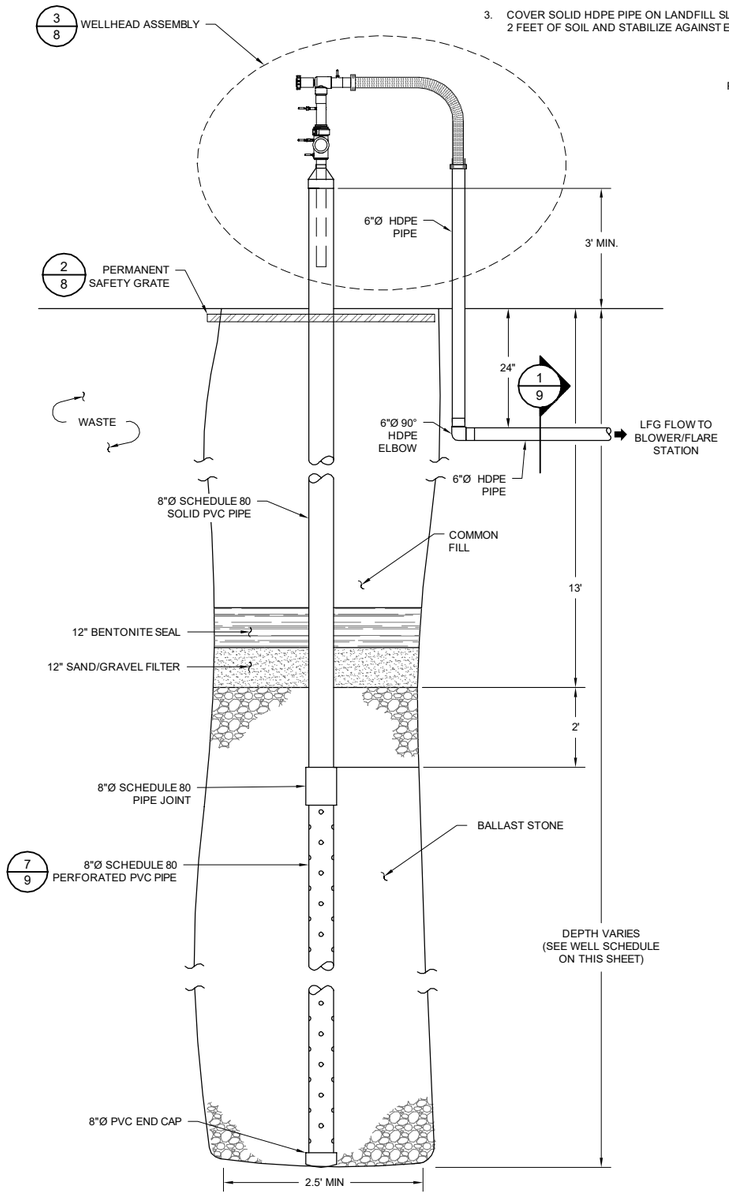
NOTES:

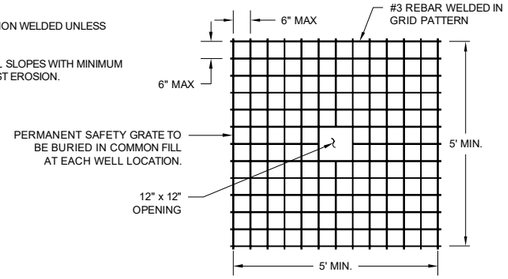
1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.



LFG EXTRACTION WELL DETAIL

1

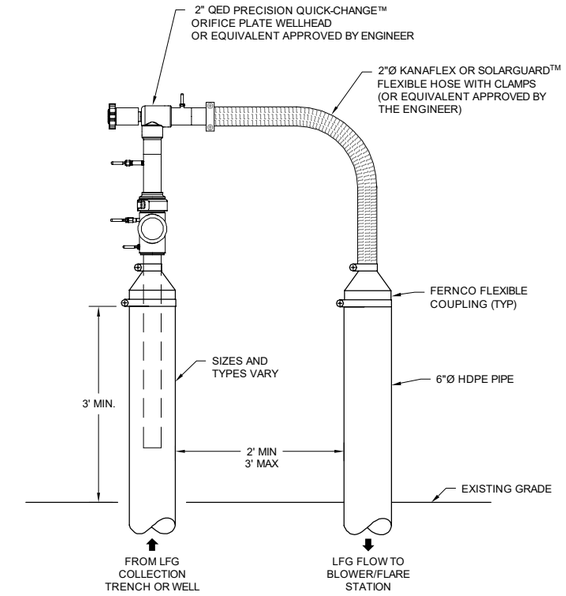
NOT TO SCALE



PERMANENT SAFETY GRATE

2

NOT TO SCALE



WELLHEAD NOTES:

A. WELLHEAD SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTION MANUAL. INSTRUCTIONS SHALL BE THOROUGHLY READ BEFORE ATTEMPTING ASSEMBLY AND INSTALLATION OF WELLHEAD.

B. WELLHEAD AND FLOW MEASUREMENT TUBE ASSEMBLY SHALL BE COMPATIBLE WITH LANDTEC GEM-2000 AND GEM-5000 LANDFILL GAS MONITORS.

C. FOR FLEXIBLE CONNECTIONS TO PIPE, USE "IPS WELD-ON 795" PLASTIC PIPE CEMENT OR EQUIVALENT APPROVED BY ENGINEER.

D. WARNING: DO NOT CUT THE FLOW MEASUREMENT TUBE ASSEMBLY. FAILURE TO HEED THIS WARNING WILL RESULT IN A DAMAGED OR INOPERATIVE WELLHEAD AND VOID THE WARRANTY. SUCH DAMAGE WOULD REQUIRE REPLACEMENT OF THE WELLHEAD.

E. ALLOW SUFFICIENT SLACK IN FLEX HOSE FOR PIPE EXPANSION AND CONTRACTION; AN EXTRA 8 TO 12 INCHES IS RECOMMENDED.

WELLHEAD ASSEMBLY

3

NOT TO SCALE

WELL SCHEDULE									
WELL DESIGNATION	NORTHING	EASTING	BOTTOM OF WASTE (FT)	TOP OF EXISTING WASTE (FT)	TOTAL WELL DEPTH (FT)	BOTTOM OF WELL SCREEN (FT)	TOP OF WELL SCREEN (FT)	SCREEN LENGTH (FT)	TOP OF CASING ELEV. (FT)
GW-129	479404.2	926333.4	222.6	341.4	103.8	237.6	326.4	88.8	344.4
GW-138	479361.6	926150.9	221.9	344.2	107.3	236.9	329.2	92.3	347.2
GW-145	479315.8	925972.6	218.5	346.6	113.1	233.5	331.6	98.1	349.6
GW-152	479271.1	925778.5	213.5	346.8	118.3	228.5	331.8	103.3	349.8
GW-160	479222.3	925628.1	211.5	311.6	85.1	226.5	296.6	70.1	314.6
GW-172	479270.3	925516.2	206.9	275.0	53.2	221.9	260.0	38.2	278.0
GW-196	479089.5	925527.5	199.6	271.4	56.7	214.6	256.4	41.7	274.4
GW-203	478956.4	925622.8	197.7	308.4	95.7	212.7	293.4	80.7	311.4
GW-205	479082.4	925732.1	206.8	347.2	125.4	221.8	332.2	110.4	350.2
GW-209	479011.5	925832.0	211.0	364.8	138.7	226.0	349.8	123.7	367.8
GW-211	479176.5	925885.9	214.9	369.0	139.1	229.9	354.0	124.1	372.0
GW-216	479045.7	925993.6	216.6	380.8	149.2	231.6	365.8	134.2	383.8
GW-218	479183.9	926080.9	215.4	388.5	158.1	230.4	373.5	143.1	391.5
GW-219	479065.1	926186.3	215.0	390.0	160.0	230.0	375.0	145.0	393.0
GW-221	479233.2	926265.4	216.7	386.4	154.7	231.7	371.4	139.7	389.4
GW-223	479252.5	926432.5	220.3	371.0	135.6	235.3	356.0	120.6	374.0

WELL SCHEDULE NOTES:

1. DRILLING SHALL NOT COMMENCE UNTIL ENGINEER IS PROVIDED AS-BUILT LINER SYSTEM GRADES FOR CELL 15 AND IS GIVEN THE OPPORTUNITY TO UPDATE THE WELL SCHEDULE ACCORDINGLY.
2. LFG EXTRACTION WELLS SHALL BE INSTALLED WITHIN ONE FOOT OF LISTED LOCATIONS AND TO THE NEAREST FOOT IN DEPTH.
3. A TEMPORARY BENCHMARK WITH GROUND SURFACE ELEVATION SHALL BE ESTABLISHED AT EACH WELL PRIOR TO DRILLING.
4. 15 FEET OF SOLID RISER IS TO BE PROVIDED BELOW INTERMEDIATE COVER GRADES. THE INTENT IS TO PROVIDE 3 FEET OF STICK UP ABOVE FILL GRADES.

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE · RYAN L. CLAY · 16411 · LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

DETAILS

PROJECT NUMBER: 2536.36

SHEET NUMBER: 8 OF 13

FILE: P:\2536\2536.36\Graphics\Fixed CAD\Cell 15 LFG Design\08- 1C-Details.dwg
LAYOUT: 1C-Details
LTB: Y:\LE - BFA Standards
PLOT DATE: 2/6/23

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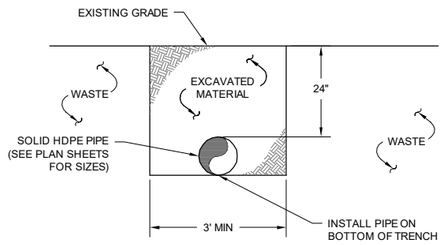
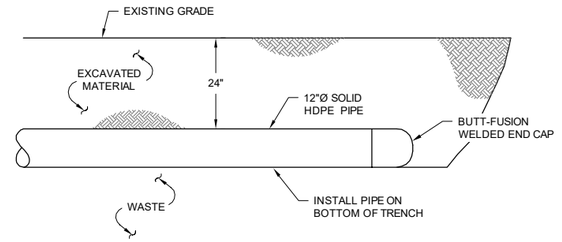
NOTES:

1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
2. SOLID HDPE PIPE SHALL BE BUTT-FUSION WELDED UNLESS OTHERWISE INDICATED.
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.



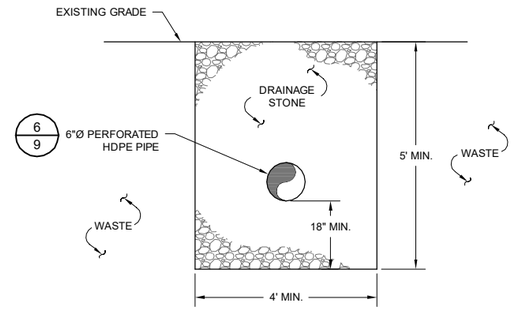
SOLID PIPE TRENCH (IN WASTE)

1 — NOT TO SCALE



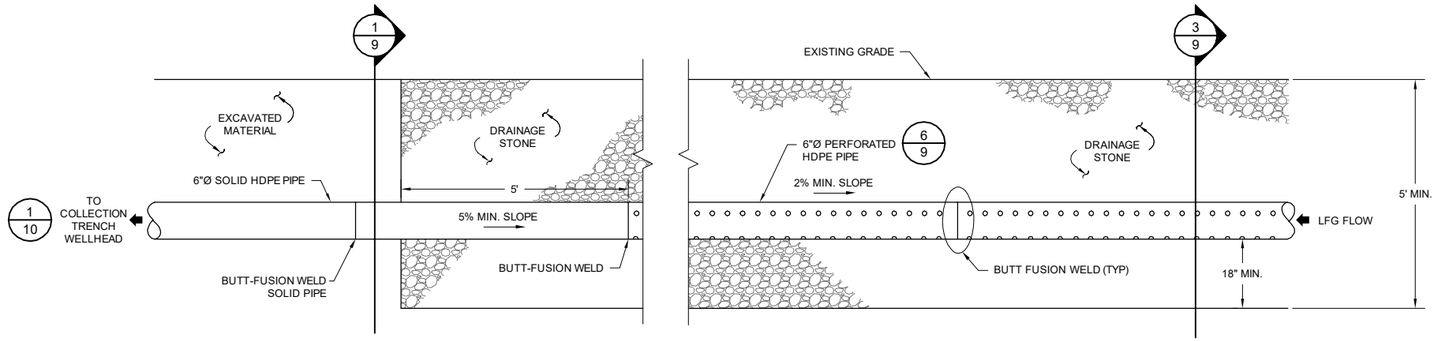
TEMPORARY SOLID PIPE TERMINATION

2 — NOT TO SCALE



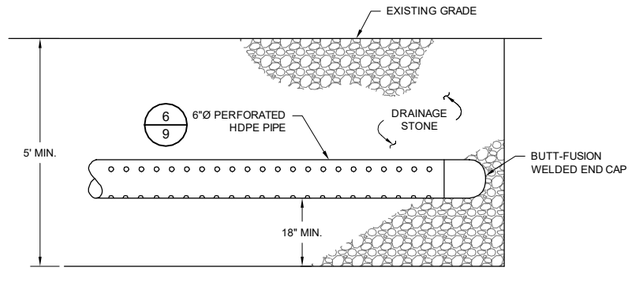
LFG COLLECTION TRENCH

3 — NOT TO SCALE



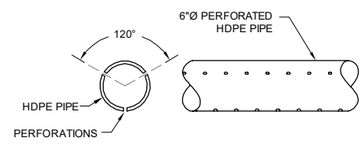
LFG COLLECTION TRENCH TRANSITION

4 — NOT TO SCALE



COLLECTION TRENCH TERMINATION

5 — NOT TO SCALE

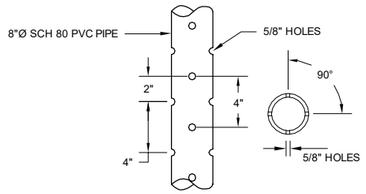


NOTE:

1. HOLES SHALL BE 1/2"Ø DRILLED HOLES SPACED 12" APART ALONG THE LENGTH OF THE PIPE OR APPROVED EQUIVALENT BY OWNER.

PERFORATED HDPE PIPE

6 — NOT TO SCALE (GAS COLLECTION TRENCHES)

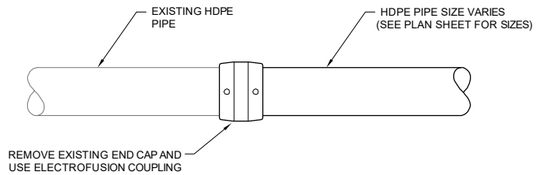


NOTES:

1. PERFORATIONS SPACED 90° APART HORIZONTALLY.
2. PERFORATIONS SPACED 4" APART VERTICALLY.
3. 90° AND 270° ROWS STAGGERED 2" BELOW 0° AND 180° ROWS.

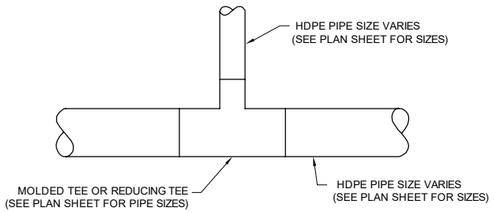
PERFORATED PVC PIPE

7 — NOT TO SCALE (LFG EXTRACTION WELLS)



CONNECTION TO EXISTING CONVEYANCE PIPE

8 — NOT TO SCALE



PLAN VIEW

"TEE" INSTALLATION

9 — NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE — RYAN L CLAY — 16411 — LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.36

DETAILS

SHEET NUMBER: 9 OF 13

FILE: P:\2500s\2536.36\Graphics\Final\Sheet\CADCell 15 LFG Design\09 - 10 Details.dwg
LAYOUT: 9 OF 13
CREATED: BY: Rebekah.Hamblin
PLOT DATE: 24/23

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NOTES:

1. HDPE PIPE SHALL BE SDR 17. FITTINGS SHALL BE SDR 11 OR SDR 17.
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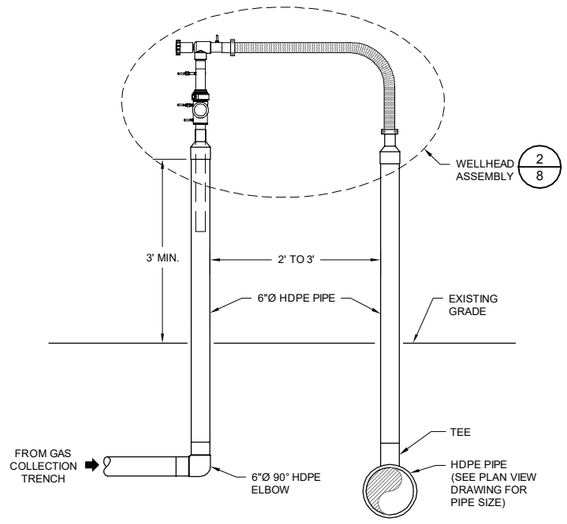
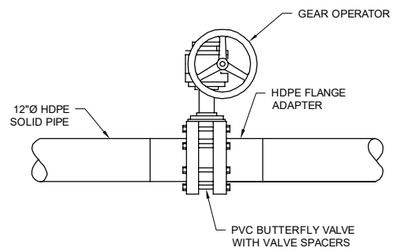
3. COVER SOLID HDPE PIPE ON LANDFILL SLOPES WITH MINIMUM 2 FEET OF SOIL AND STABILIZE AGAINST EROSION.



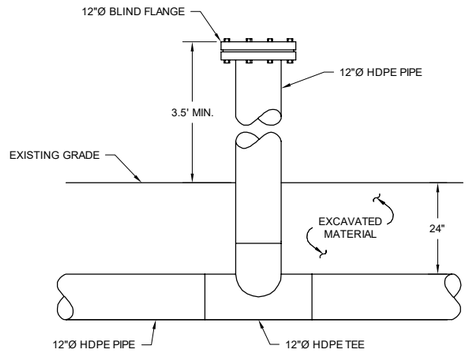
COLLECTION TRENCH WELLHEAD

1 NOT TO SCALE



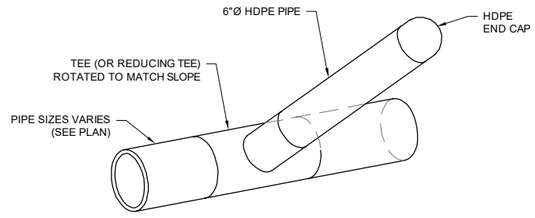
ISOLATION VALVE

2 NOT TO SCALE



VERTICAL RISER

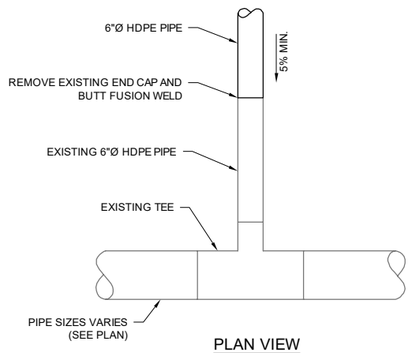
3 NOT TO SCALE



ISOMETRIC VIEW

6"Ø PIPE STUB

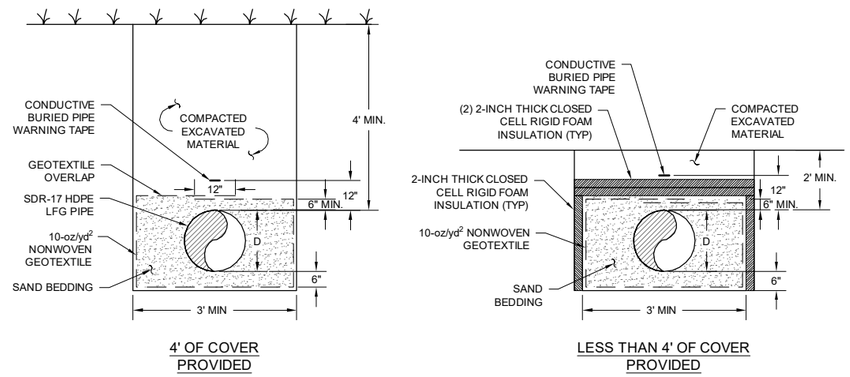
4 NOT TO SCALE



PLAN VIEW

CONNECTION TO EXISTING 6"Ø STUB

5 NOT TO SCALE

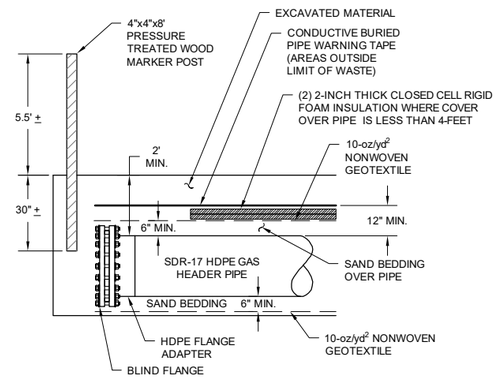


4' OF COVER PROVIDED

LESS THAN 4' OF COVER PROVIDED

GAS HEADER PIPE TRENCH OUTSIDE LIMIT OF WASTE

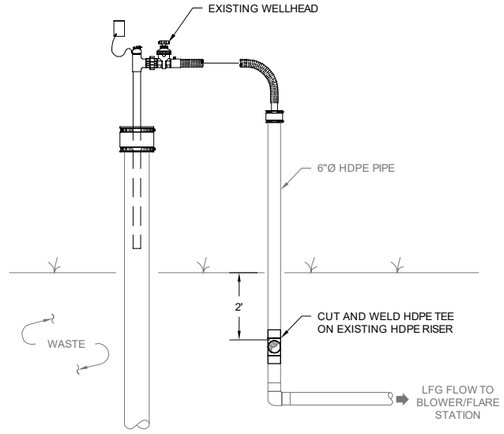
6 NOT TO SCALE



ELEVATION VIEW

HEADER TERMINATION

7 NOT TO SCALE



CONNECT TO VACUUM SOURCE AT EXISTING LFG WELL

8 NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE RYAN L CLAY 16411 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

DETAILS

PROJECT NUMBER: 2536.36

SHEET NUMBER: 10 OF 13

FILE: P:\2500s\2536.34\Graphics\Final\CAD\Cell 15 LFG Drawings\8- 10 Details.dwg
LAYOUT: 10 - Details
CTB FILE: SH Standards
PLOT DATE: 2/6/23

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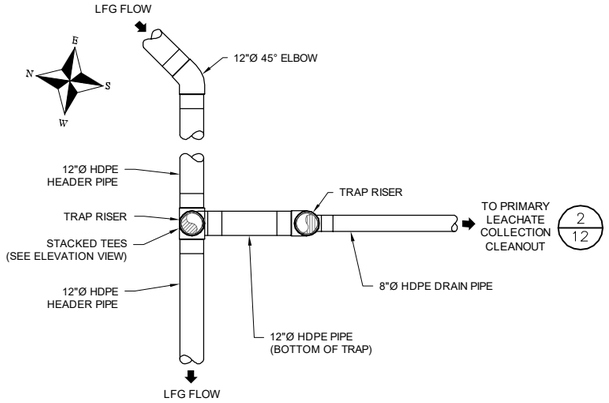
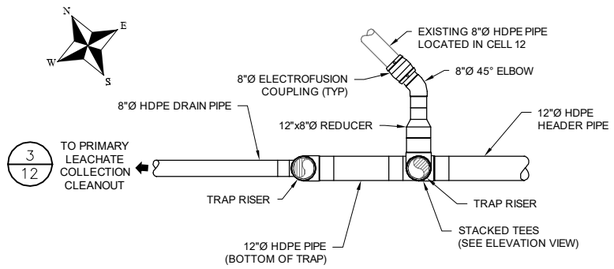
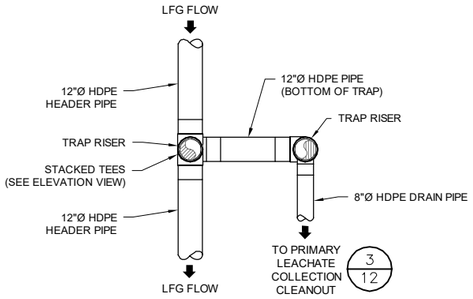


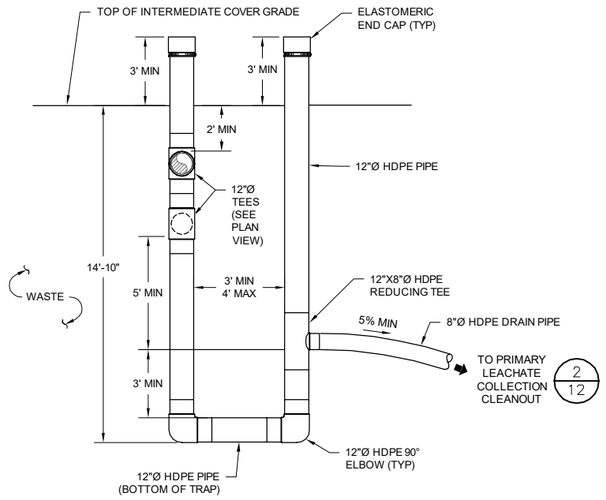
PLAN VIEW



PLAN VIEW



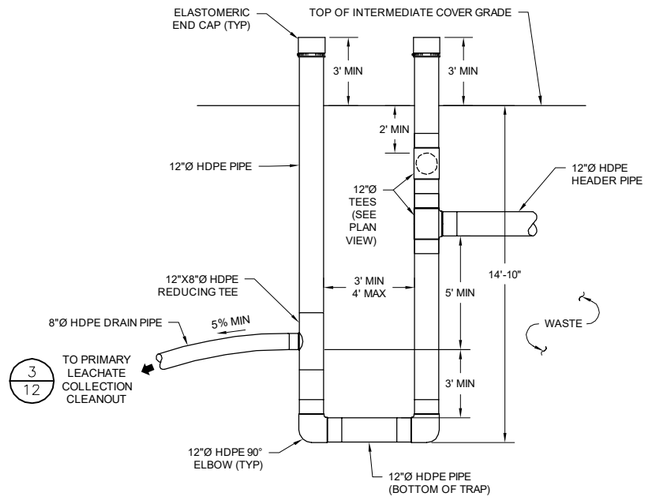
PLAN VIEW



ELEVATION VIEW

1 CONDENSATE TRAP CT-15A

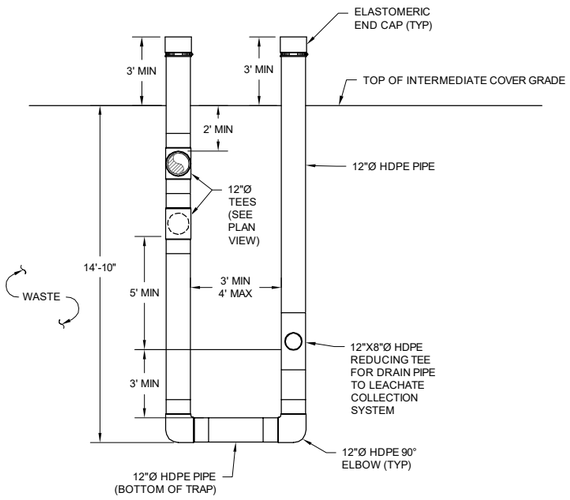
NOT TO SCALE



ELEVATION VIEW

2 CONDENSATE TRAP CT-15B

NOT TO SCALE



ELEVATION VIEW

3 CONDENSATE TRAPS CT-1R AND CT-4R

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE — RYAN L. CLAY — 16411 — LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

DETAILS

PROJECT NUMBER: 2536.36

SHEET NUMBER: 11 OF 13

FILE: P:\2536\2536.36\Graphics\Final\ACAD\cell 15 LFG Design\11 - 13 - Details - Condensate Trapping Layout.dwg
LAYOUT: 11 - Details
CTB FILE: BW4.ctb
PLOTDATE: 2023

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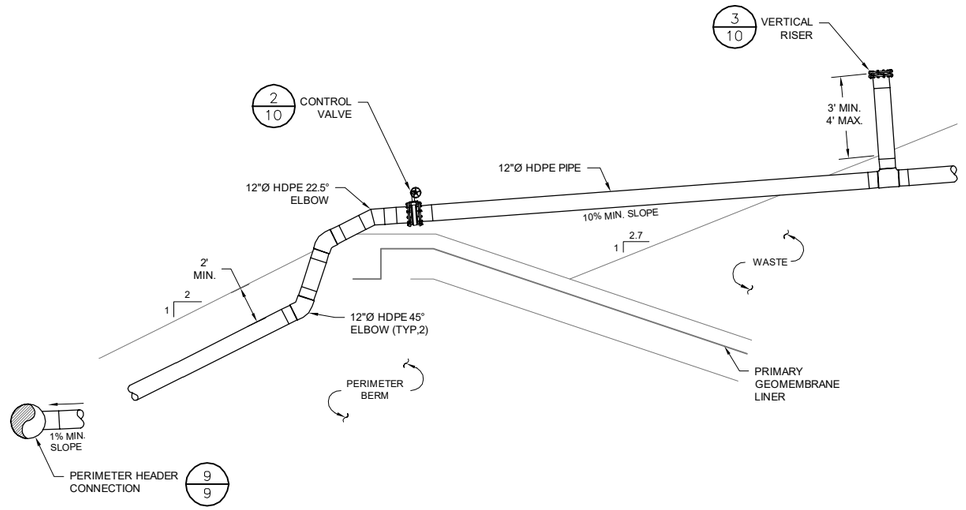
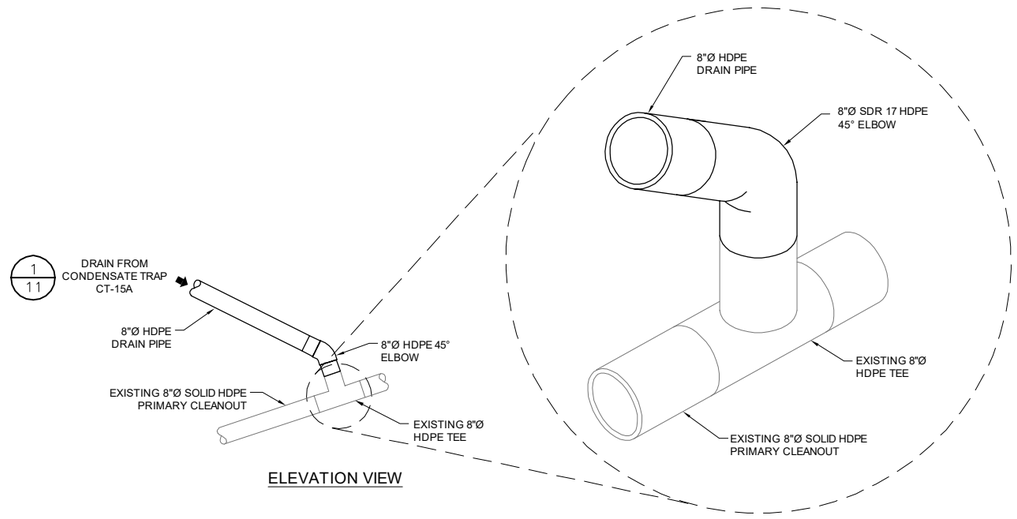


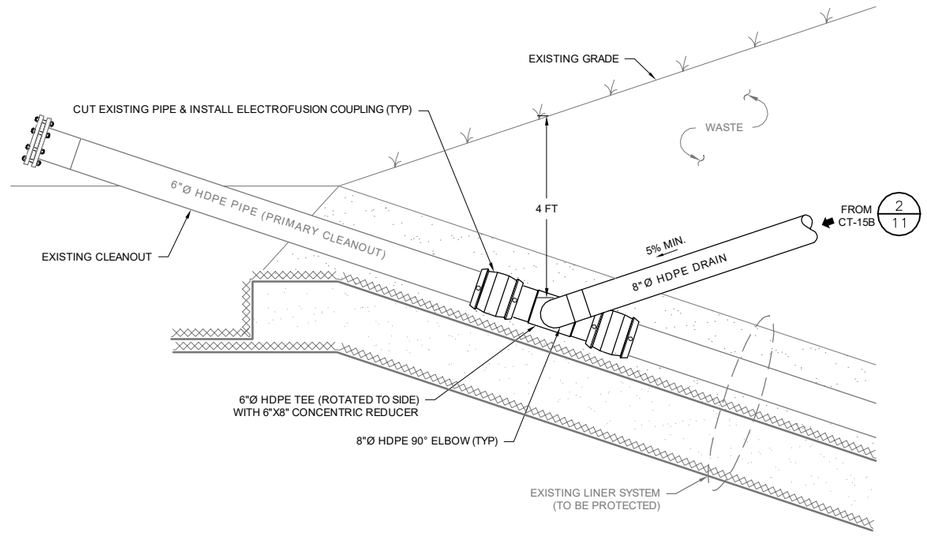
1 ANCHOR TRENCH CROSSING

NOT TO SCALE



2 DRAIN TIE-IN TO CELL 15 PRIMARY LEACHATE COLLECTION CLEANOUT

NOT TO SCALE (CT-15A)



3 DRAIN TIE-IN TO EXISTING PRIMARY LEACHATE COLLECTION CLEANOUT

NOT TO SCALE (CT-15B, CT-1R, AND CT-4R)

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE RYAN L. CLAY 16411 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
PROJECT MGR: R. CLAY
PIC: T. REED
DATE: FEBRUARY 2023

CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

PROJECT NUMBER: 2536.36

DETAILS

SHEET NUMBER: 12 OF 13

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CTB FILE: SH Standards
PLOT DATE: 3/6/23

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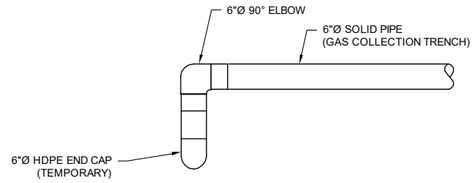
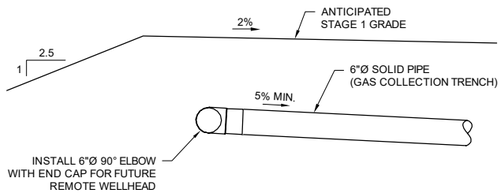


PLAN VIEW

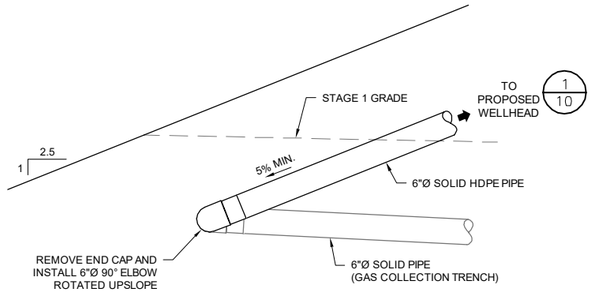


ELEVATION VIEW

TEMPORARY GAS COLLECTION TRENCH TERMINATION

1

NOT TO SCALE

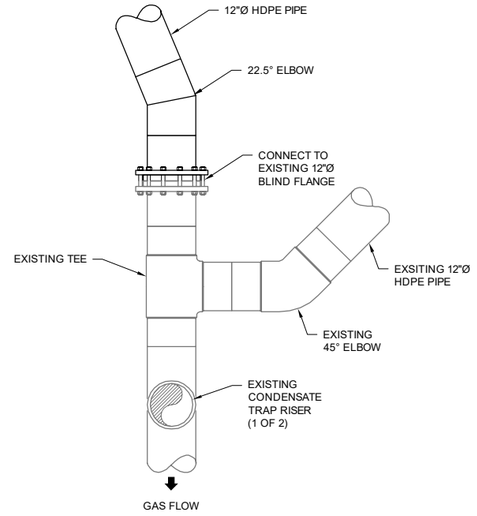


ELEVATION VIEW

COLLECTION TRENCH EXTENSION TO UPSLOPE WELLHEAD

2

NOT TO SCALE



PLAN VIEW

CONNECT TO BLIND FLANGE AT EXISTING CONDENSATE TRAP

3

NOT TO SCALE

SANBORN HEAD

SCALE AS NOTED

STATE OF MAINE
RYAN
L
CLAY
16411
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY

DRAWN BY: Z. SAGENDORF
DESIGNED BY: Z. SAGENDORF
REVIEWED BY: R. CLAY
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CELL 15 LANDFILL GAS SYSTEM EXPANSION
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

DETAILS

PROJECT NUMBER: 2536.36

SHEET NUMBER: 13 OF 13

FILE: P:\2500s\2536.36\Graphics\ FreeCAD\Cell 15 LFG Design\11 - 13 - Details - Condensate Trapping
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PLOT DATE: 24/23

CELL 16 Development / Landfill Gas System Expansion Drawings

DESIGN REPORT
FOR CELL 16
JUNIPER RIDGE LANDFILL
OLD TOWN, MAINE

1.0 INTRODUCTION

This document is the Design Report (the Report) for Cell 16 of the Juniper Ridge Landfill (JRL or the landfill) in Old Town, Maine, prepared by Sevee & Maher Engineers, Inc. (SME). The landfill is operated by New England Waste Services of Maine Landfill Operations, LLC (NEWSME) on behalf of the state of Maine and the Maine Bureau of General Services (BGS). JRL is owned by the State of Maine and managed by the Maine Bureau of General Services (BGS). Cell 16 will be the sixth landfill cell of the JRL Expansion Project (Expansion Project) approved by the Maine Department of Environmental Protection (MEDEP) Board Order #S-020700-WD-BI-N (issued on June 1, 2017), Natural Resource Protection Act (NRPA) license #L-19015-TG-D-N, and the City of Old Town Solid Waste Permit that was issued on November 14, 2017.

JRL is a 121.5-acre secure solid waste landfill facility (the Site) located on an approximately 780-acre parcel of land in Old Town, Maine. Condition 5 of the 2017 MEDEP Board Order stipulated that "at least four months prior to new cell construction and related infrastructure, the applicant must submit the detailed design package for the Department's review and approval." This Report is submitted as part of the Cell 16 design package.

To date, approximately 108.8 acres (Cells 1, 2, 3A, 3B, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15) of JRL's 121.5-acre permitted footprint have been developed. The existing infrastructure at JRL also includes approximately two miles of paved access roads, a landfill perimeter access road and security fence, a scale house, a maintenance building, a storage shed, five leachate pump stations, an aboveground leachate storage tank, one loading station for leachate haul trucks, a landfill gas flare, a landfill gas treatment facility, numerous detention/sedimentation ponds, soil stockpile areas, and groundwater and surface water monitoring locations. The Site also includes an MEDEP-permitted till borrow pit and a wood waste storage facility.

This Report provides a brief narrative of the engineered systems for Cell 16 and includes the following items:

1) Design calculations (Appendix A);
2) Stormwater Management, Erosion, and Sedimentation Control Plan (Appendix B);
3) Cell Development Plans (Appendix C);
4) Landfill Gas Development Plans (Appendix D);

5) Geotechnical Evaluation (Appendix E); and

6) Contract Bid Documents, Technical Specifications, Construction Drawings, and a construction Quality Assurance/Quality Control (QA/QC) Plan (Appendix F).

2.0 CELL 16 OVERVIEW

Cell 16 will be the sixth secure landfill cell of the Expansion Project, and is located north of and adjacent to existing Cell 15 and west of and adjacent to Cells 12 and 13. The construction of Cell 16 will increase the constructed footprint at the JRL by approximately 6 acres and provide approximately 1.7 million cubic yards of disposal capacity. Cell 16 will be constructed during the 2024 construction season. In addition to the construction of JRL Cell 16, the 2024 site improvements include the associated landfill access ramp, a 12-foot-wide gravel maintenance road, extensions of the force main and landfill gas header piping, a new pump station that will combine leachate flows from Cells 15, 16, and future Cell 17, and stormwater management structures.

The location, base grades, liners, and leachate and gas collection and conveyance systems for Cell 16 were approved as part of the Expansion Project. Cell 16 construction will include:

- Installing erosion control measures;
- Installing an augmented liner under a portion of Cell 16 adjacent to Cell 15 and Cell 16's western perimeter berm;
- Installing the cell's secondary liner, leak detection system, primary liner, and leachate collection systems;
- Constructing the cell's leachate and leak detection collection sump and pump systems including construction of a new pump station to carry combined Cells 15 and 16 leachate and Cell 16 leak detection flows, and tying into the existing force main for conveyance to the on-site leachate aboveground storage tank (AST);
- Extension of the force main and landfill gas header piping;
- Installing litter fence around the Cell 16 exterior perimeter;
- Installation of two new culverts and one catch basin; and
- Constructing a 12-foot-wide gravel maintenance road north of Cell 16.

The base grades for Cell 16 are herringboned with an overall slope to the west towards the Cell 16 collection sump. Leachate piping from Cell 15 will be connected to Cell 16 leachate piping when the temporary sand berm between the two cells is removed. Leak detection flows collected from Cell 16 will be pumped to the Cell 16 leachate collection sump, then, along with the Cell 15 and 16 leachate to the AST tank via a force main. Leak detection flows in Cell 15 will be pumped directly to the force main and the AST by the Cell 15 leak detection pump. When it is constructed, Cell 17 leak detection and leachate collection will flow to the Cell 16 pump station.

Access to Cell 16 will initially be near the northeast corner of the cell at the end of the existing access road. The sequence of waste placement, existing intermediate cover removal, and the installation of intermediate cover are presented in detail in the Cell Development Plans contained in Appendix C. The installation of gas collection piping is presented in detail in the Landfill Gas Development Plans contained in Appendix D.

3.0 LINER SYSTEM

The Cell 16 liner system will consist of a leachate collection system and composite primary liner, a leak detection system, and a composite secondary liner. A portion of Cell 16 has an augmented liner.

The leachate collection and composite primary liner systems will consist of the following components as shown on the Construction Drawing details contained in Appendix F:

- A network of 6-inch and 8-inch-diameter perforated HDPE pipe;
- A dedicated leachate collection pump system;
- A 12-inch-thick layer of sand (hydraulic conductivity $\geq 5x10^{-3}$ cm/sec);
- A geocomposite drainage net with a minimum calculated transmissivity $\geq 3.2 \times 10^{-4}$ m^2/sec;
- An 80-mil high-density polyethylene (HDPE) textured geomembrane;
- A geosynthetic clay liner (GCL); and
- A 12-inch-thick clay barrier soil layer (hydraulic conductivity $\leq 1x10^{-7}$ cm/sec).

The leak detection system and secondary liner have been designed to detect leaks within 30 days and will consist of the following components as shown on the Construction Drawing details contained in Appendix F:

- A network of 6-inch-diameter perforated HDPE pipe;
- A dedicated leak detection pump system;
- A 12-inch-thick layer of sand (hydraulic conductivity $\geq 5x10^{-3}$ cm/sec);
- A geocomposite drainage net with a minimum calculated transmissivity $\geq 2x10^{-5}$ m^2/sec;
- A 60-mil HDPE textured geomembrane; and
- A 12-inch-thick clay barrier soil layer (hydraulic conductivity $\leq 1x10^{-7}$ cm/sec).

A portion of the cell's secondary liner adjacent to Cell 15 and the western perimeter berm will be augmented with a GCL and an additional 12 inches of clay barrier soil due to shallow bedrock. The augmented liner location and construction details are provided in the Construction Drawings contained in Appendix F.

The geomembranes used in the liner systems will meet the GRI GM-13 standards and the performance requirements contained in the Construction Drawings, Technical Specifications, and QA/QC Plan included in Appendix F.

The GCL liner will consist of a sodium montmorillonite clay sandwiched between two geotextile fabrics. The specified average hydraulic conductivity for the GCL will be $5x10^{-9}$ cm/sec or less. The soil used in the liners will consist of recompacted clay containing a minimum of 35 percent fines having a liquid limit greater than or equal to 20 and a plastic index greater than or equal to 8 but less than 30. The soil will be placed in a manner that produces a homogeneous layer that eliminates soil clods and preferential flow paths, protects the geomembrane from puncture, and reduces the soil's hydraulic conductivity to the maximum extent practicable.

The 12-inch-thick compacted clay barrier soil will meet the following criteria:

- Recompacted hydraulic conductivity $\leq 1x10^{-7}$ cm/sec;
- Minimum in-place density of 90 percent as measured by ASTM D 698 (Standard Proctor);
- Compaction techniques using kneading action to remold the soil, working within 0 to 4 percent above the optimum moisture content as determined using ASTM D 698; and
- Maximum stone size $\leq$ ½-inch in the surface layer directly beneath the GCL or HDPE geomembrane.

Details of the liner system design and the construction QA/QC protocols proposed for the Cell 16 liner, including soils characterization, liner material conformance testing, interface friction testing, and electric leak location testing, are included with the Cell 16 Technical Specifications provided in Appendix F.

4.0 LEAK DETECTION AND LEACHATE COLLECTION SYSTEMS

The Cell 16 leachate collection system consists of a 12-inch-thick layer of sand, drainage stone and filter stone, perforated HDPE collection piping (minimum diameter of six inches), and a drainage geocomposite. The leak detection system consists of a 12-inch-thick layer of sand, drainage stone wrapped in geotextile, perforated HDPE collection piping (minimum diameter of six inches), and a drainage geocomposite. The leak detection and leachate collection system are both gravity drain/sump and pump systems that have been designed to meet the MEDEP's design criteria for detection time and maximum head on a liner for the leak detection and leachate collection systems, respectively. These calculations use estimated flow generation rates predicted by the U.S. Environmental Protection Agency Hydrologic Evaluation of Landfill Performance (HELP) model Version 3. One transducer will be placed within the Cell 16 drainage sand layer to monitor the performance of the leachate collection system.

The flow in the leak detection and leachate collection headers is conveyed south to north along the western perimeter berm. Cleanouts are provided for the Cell 16 leak detection and leachate collection laterals and perimeter header piping. The Cell 16 leak detection and leachate collection systems drain by gravity to the Cell 16 pump station sump located on the northwest corner of Cell 16. The Cell 16 leachate sump and pump systems will become the permanent sump and pump station for Cell 15 leachate flows, Cell 16 leachate and leak detection flows, and Cell 17 leachate and leak detection flows. The Cell 16 sump and pump are designed to manage leachate flows under anticipated worst-case conditions along with anticipated leachate base flows for Cells 15, 16, and 17. The Cell 16 leak detection flows are metered and pumped to the Cell 16 leachate collection sump where they are combined with the leachate flows and pumped from the Cell 16 sump to the 900,000-gallon AST for temporary storage prior to being trucked off-site for treatment. The Cell 15 leak detection system will remain separate from Cell 16.

Design calculations for leachate transport and storage, perforated pipe, leachate collection and leak detection head on the liner, and pipe strength, sizing, and spacing are provided in Appendix A.

5.0 LEACHATE TRANSPORT/STORAGE SYSTEM

All leachate generated on-site will be contained, collected, and stored on-site until it can be transported off-site for treatment. The Cell 16 permanent leachate sump and two 5-horsepower submersible pumps. From the sump, the leachate is pumped through the existing 6-inch by 10-inch dual-contained force main to the on-site 900,000-gallon AST. Design calculations pertaining to leachate transport and storage are included in Appendix A-2.

6.0 GEOTECHNICAL EVALUATION

As part of the design, a geotechnical evaluation was performed for the development of Cell 16 using the project-specific material and interface strengths. The results of the geotechnical evaluation are provided in Appendix E.

7.0 STORMWATER MANAGEMENT/EROSION AND SEDIMENTATION CONTROL SYSTEM

Stormwater Management, Erosion and Sedimentation Control Plans (SMESCP) have been prepared and implemented for each JRL cell construction project in accordance with the facility's operating permits and with MEDEP Best Management Practices for Stormwater and Erosion Control. The Cell 16 SMESCP is included as Appendix B of this Report.

The construction of Cell 16 will utilize both existing and proposed stormwater and erosion control structures (i.e., ditches and culverts). Two new culverts and one new catch basin will be installed as part of the Cell 16 construction.

Design calculations for the erosion control structures are included in the SMESCP in Appendix B. The strategy to minimize sediment and erosion on the Site during the 2024 construction project will include the use of both temporary erosion control measures (e.g., diversion berms, siltation fences, sediment barriers, temporary seeding, mulching, and stone check dams) and permanent structural measures (e.g., grass lined ditches, detention ponds, permanent seeding, and culvert inlet and outlet protection).

8.0 CELL DEVELOPMENT PLANS

Operational Cell Development Plans for Cell 16 are included in Appendix C. Landfill Gas Development Plans for Cell 16 are included in Appendix D.

9.0 CONTRACT BID DOCUMENTS, TECHNICAL SPECIFICATIONS, DESIGN DRAWINGS, AND QUALITY ASSURANCE/QUALITY CONTROL PLAN

Contract Bid Documents, Technical Specifications, Construction Drawings, and a QA/QC Plan for Cell 16 construction are included in Appendix F.

CELL 12

CELL 13

CELL 14

CELL 15
STAGE 5
DEVELOPMENT

CELL 15

CELL 16

EXISTING TOPOGRAPHY
AS OF 6-23-2023
SEE NOTE 1

TEMPORARY LEACHATE
COLLECTION INLET
SEE FIGURE 16-8

EXTEND 8" DIA LEACHATE
COLLECTION TO TEMPORARY
LEACHATE COLLECTION INLET

EXISTING CELL 15
OPERATIONAL WASTE
GRADES (TYP)

PERIMETER BERM DOWNSPOUT
AND PLUNGE POOL
SEE FIGURE 16-8

CELL 16 ACCESS
RAMP (TYP)

GRAVEL MAINTENANCE
ROAD (TYP)

LEACHATE COLLECTION
LATERAL (TYP)

CELL 16 BASE
GRADES (TYP)

CELL 16 LINER LIMIT (TYP)

CELL 16 TEMPORARY
CONTAINMENT BERM

24" DIA HDPE
TEMPORARY CULVERT

CB-16-1
SEE DWG C-301

CELL 16 PUMPSTATION

24" DIA HDPE CULVERT

LEVEL SPREADER

LEVEL SPREADER

CELL 15 PUMPSTATION

WEST ACCESS ROAD

CULVERT CROSSING (TYP)

INSTALL HAY BALE
DIVERSION BERM (TYP)

NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/23/23. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.
2. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC (SME) OF CUMBERLAND, MAINE USING PROPELLER AEROPOINTS, DATED NOVEMBER 15, 2019:
   HORIZONTAL DATUM - NAD83 MAINE, WEST, US FT.
   VERTICAL DATUM - NAVD 88, US FT.
3. WETLAND BOUNDARIES DELINEATED BY WOODLOT ALTERNATIVES, INC. IN 2004 AND STANTEC CONSULTING SERVICES 2008, 2014, AND 2015.
4. THE GRADES SHOWN IN THE AREA OF CELL 15 ARE THE FINAL CELL OPERATIONAL WASTE GRADES AT THE COMPLETION OF WASTE FILLING OPERATIONS IN CELL 15.
5. BASEGRADES WITHIN CELL 16 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
6. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM.
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

LEGEND

- AREA WITH EXISTING GEOMEMBRANE INTERMEDIATE COVER
- AREA WITH PROPOSED GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- PERIMETER BERM DOWNSPOUT
- LEACHATE CLEANOUT
- LEACHATE COLLECTION INLET
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- DB — INTERMEDIATE COVER STORMWATER DIVERSION BERM

CELL 16 LINED AREA = 6.0 ACRES

40 0 80 160 FEET

FIGURE 16-1
CELL 16 DEVELOPMENT
INITIAL CONDITIONS
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

SME
SEVEE & MAHER ENGINEERS
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE
4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021
Phone 207.829.5016 • Fax 207.829.5692 • sme-engineers.com

DWG: C16-CELLDEV LMN: INITIAL CTB: SME-STD.CTB REV: 4/26/2024

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NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/23/23. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.
2. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC (SME) OF CUMBERLAND, MAINE USING PROPELLER AEROPOINTS, DATED NOVEMBER 15, 2019:
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LEGEND

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- AREA WITH PROPOSED GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- LEACHATE CLEANOUT
- LEACHATE COLLECTION INLET
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- DB — INTERMEDIATE COVER STORMWATER DIVERSION BERM

CELL 15
STAGE 5
DEVELOPMENT

CELL 12
CELL 13
CELL 14
CELL 15
CELL 16

TEMPORARY LEACHATE COLLECTION INLET SEE FIGURE 16-8

EXTEND 8" DIA LEACHATE COLLECTION TO TEMPORARY LEACHATE COLLECTION INLET

CELL 16 ACCESS RAMP (TYP)

GRAVEL MAINTENANCE ROAD (TYP)

CELL 16 LINER LIMIT (TYP)

CELL 16 TEMPORARY CONTAINMENT BERM

CELL 16 STAGE 1 OPERATIONAL WASTE GRADES (TYP)

24" DIA HDPE TEMPORARY CULVERT

CATCH BASIN

24" DIA HDPE CULVERT

LEVEL SPREADER

CELL 16 PUMPSTATION

CELL 15 PUMPSTATION

WEST ACCESS ROAD

CULVERT CROSSING (TYP)

ESTIMATED STAGE 1 CAPACITY = 235,600 CY

40 0 80 160 FEET

FIGURE 16-2
CELL 16 DEVELOPMENT
STAGE 1 DEVELOPMENT
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

DWG: C16-CELLDEV LMN: STAGE-1 CTB: SME-STD.CTB REV: 4/26/2024

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N

CELL 12

CELL 13

CELL 14

CELL 15
STAGE 5
DEVELOPMENT

CELL 15

CELL 16

TEMPORARY LEACHATE COLLECTION INLET
SEE FIGURE 16-8

EXTEND 8" DIA LEACHATE COLLECTION TO TEMPORARY LEACHATE COLLECTION INLET

LOWER ACCESS TO BE FILLED

CELL 16 STAGE 2 OPERATIONAL WASTE GRADES (TYP)

WEST ACCESS ROAD

CULVERT CROSSING (TYP)

GRAVEL MAINTENANCE ROAD (TYP)

CELL 16 LINER LIMIT (TYP)

CELL 16 TEMPORARY CONTAINMENT BERM

24" DIA HDPE TEMPORARY CULVERT

CELL 16 PUMPSTATION

CELL 15 PUMPSTATION

CATCH BASIN

24" DIA HDPE CULVERT

LEVEL SPREADER

NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/23/23. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.
2. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC (SME) OF CUMBERLAND, MAINE USING PROPELLER AEROPOINTS, DATED NOVEMBER 15, 2019:
   HORIZONTAL DATUM - NAD83 MAINE, WEST, US FT.
   VERTICAL DATUM - NAVD 88, US FT.
3. WETLAND BOUNDARIES DELINEATED BY WOODLOT ALTERNATIVES, INC. IN 2004 AND STANTEC CONSULTING SERVICES 2008, 2014, AND 2015.
4. THE GRADES SHOWN IN THE AREA OF CELL 15 ARE THE FINAL CELL OPERATIONAL WASTE GRADES AT THE COMPLETION OF WASTE FILLING OPERATIONS IN CELL 15.
5. BASEGRADES WITHIN CELL 16 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
6. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM.
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

LEGEND

- AREA WITH EXISTING GEOMEMBRANE INTERMEDIATE COVER
- AREA WITH PROPOSED GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- LEACHATE CLEANOUT
- LEACHATE COLLECTION INLET
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- DB — INTERMEDIATE COVER STORMWATER DIVERSION BERM

ESTIMATED STAGE 2
CAPACITY = 347,400 CY

40 0 80 160 FEET

FIGURE 16-3
CELL 16 DEVELOPMENT
STAGE 2 DEVELOPMENT
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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NOTES:

1. BASE MAP PREPARED BY AERIAL SURVEY & PHOTO INC., NORRIDGEWOCK, MAINE. PHOTO DATE 6/23/23. VERTICAL DATUM: BRASS PLUG AT PUMP STATION AND AT THE ADMINISTRATION BUILDING. HORIZONTAL DATUM: MAINE STATE COORDINATES EAST ZONE NAD 83. GROUND CONTROL BY SEVEE & MAHER ENGINEERS, INC, CUMBERLAND, MAINE.
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3. WETLAND BOUNDARIES DELINEATED BY WOODLOT ALTERNATIVES, INC. IN 2004 AND STANTEC CONSULTING SERVICES 2008, 2014, AND 2015.
4. THE GRADES SHOWN IN THE AREA OF CELL 15 ARE THE FINAL CELL OPERATIONAL WASTE GRADES AT THE COMPLETION OF WASTE FILLING OPERATIONS IN CELL 15.
5. BASEGRADES WITHIN CELL 16 LIMITS REPRESENT BASE GRADES PRIOR TO PLACEMENT OF THE IMPORTED CLAY LAYER AND CONSTRUCTION OF LINER SYSTEM.
6. JUNIPER RIDGE LANDFILL IS AN ACTIVE LANDFILL FACILITY AND TOPOGRAPHY WITHIN ACTIVE LIMITS OF CELL ARE SUBJECT TO CHANGE.
7. A FIVE FOOT/SOFT LAYER/FROST PROTECTION LAYER SHALL BE PLACED OVER THE LEACHATE COLLECTION SYSTEM.
8. ALL SITE AND CONSTRUCTION ACTIVITIES SHALL BE IN COMPLIANCE WITH MEDEP BEST MANAGEMENT PRACTICES AND EXISTING FEDERAL, STATE, AND LOCAL PERMITS AND PERMITTING REQUIREMENTS FOR THE SITE.

LEGEND

- AREA WITH EXISTING GEOMEMBRANE INTERMEDIATE COVER
- AREA WITH PROPOSED GEOMEMBRANE INTERMEDIATE COVER
- LC — EXISTING LEACHATE COLLECTION PIPING
- LEACHATE CLEANOUT
- LEACHATE COLLECTION INLET
- CATCH BASIN AND CULVERT WITH RIPRAP APRON
- CULVERT WITH RIPRAP APRON
- CLEAN STORMWATER DITCH AND DIRECTION OF FLOW
- DB — INTERMEDIATE COVER STORMWATER DIVERSION BERM

TEMPORARY LEACHATE COLLECTION INLET SEE FIGURE 16-8

8"LC

EXTEND 8" DIA LEACHATE COLLECTION TO TEMPORARY LEACHATE COLLECTION INLET

CELL 12

CELL 13

CELL 14

CELL 15 STAGE 5 DEVELOPMENT

TIE INTO EXISTING HAYBALE DIVERSION BERM (TYP)

CELL 16 STAGE 3 OPERATIONAL WASTE GRADES (TYP)

CELL 15

CELL 16

INSTALL CELL 16 INTERMEDIATE COVER (STAGE 1 THROUGH 3) (TYP)

GRAVEL MAINTENANCE ROAD (TYP)

STAGE 3 ACCESS ROAD DEVELOPMENT (TYP)

INSTALL HAYBALE DIVERSION BERM

CELL 16 LINER LIMIT (TYP)

CULVERT TO BE INSTALLED UPON INTERMEDIATE COVER PLACEMENT (TYP)

TIE INTO EXISTING HAYBALE DIVERSION BERM (TYP)

CELL 16 TEMPORARY CONTAINMENT BERM

24" DIA HDPE TEMPORARY CULVERT

CELL 15 PUMPSTATION

CELL 16 PUMPSTATION

CATCH BASIN

24" DIA HDPE CULVERT

LEVEL SPREADER

ESTIMATED STAGE 3 CAPACITY = 344,000 CY

40 0 80 160 FEET

FIGURE 16-4
CELL 16 DEVELOPMENT
STAGE 3 DEVELOPMENT
JUNIPER RIDGE LANDFILL
NEWSME LANDFILL OPERATIONS
OLD TOWN, MAINE

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