Juniper Ridge Landfill Phase II Expansion Project Overview Meetings

Meeting #4

Seagulls, Landfill Design, Operations, and Noise

December 17, 2024





Project Overview Meeting Schedule

Nov. 7	City of Old	Town	Project History, Overview, and
6 P.M.	Town	Hall	Permitting Requirements
Nov. 21	Town of Alton	Town	Visual, Traffic, Natural
6 P.M.		Hall	Resources, Odor
Dec. 4 6 P.M.	City of Old Town	Town Hall	Geology, Hydrogeology, Water Quality, Leachate Management, and PFAS treatment
Dec. 17	City of Old	Town	Seagulls, Landfill Design,
6 P.M.	Town	Hall	Operations, and Noise



Seagulls



Site Visit Summary at Juniper Ridge Landfill

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Agenda

- 1. Objectives
- 2. Methods
- 3. Gulls at JRL
- 4. Gull Activity at JRL
- 5. Wildlife Hazards at OLD
- 6. Deterrence Strategies





Gulls at Juniper Ridge Landfill



Herring Gull (Larus argentatus)

 Coastal island breeder, closest breeding site Penobscot Bay



<u>Ring-billed Gull (Larus</u> <u>delawarensis)</u>

 Breeds in Aroostook County and Atlantic Canada



Great Black-backed Gull (Larus marinus)

 Coastal island breeder, closest breeding site Penobscot Bay

All three species:

- Roost, bathe, and drink in rivers, ponds, lakes, reservoirs and associated islands
- Migratory gulls from Atlantic Canada likely inflate local populations
- Juvenile gulls migrate further than adults

Methods

- Conducted on November 14 and 15, 2024
- Met with staff from JRL and Old Town Municipal Airport
- Surveys included multiple visits at JRL, OLD, and 13 additional "potential wildlife attractants" within 5-miles of OLD
- Potential attractants mostly included public access points with views of roosting habitat associated with the Penobscot River, Stillwater River, Pushaw Lake, Perch Pond.
- Accessible fields included in survey.



Gull Activity at JRL

- Gull activity concentrated near open waste
- Max gull population ~750 to ~900 individuals
- Large portion of gulls had immature plumage
- Pre-dawn surveys determined gulls primarily flew in from west and smaller flocks from south
- Gulls not observed roosting overnight at JRL
- Gull numbers highest in morning and dissipated through afternoon
- Gulls observed perching at JRL

Wildlife Hazards at Old Town Municipal Airport

- Discussed gull risk and deterrence efforts at OLD
- Current deterrence is pyrotechnics and physical presence
- No strike records on FAA database
- Photo dated Dec. 2022 –suggests similar seasonal peak gull numbers
- No gulls observed roosting at OLD during visit
- Location on Penobscot River increases risk of migrating gull and goose presence



Nearby Hazardous Wildlife Attractions

- Penobscot River a corridor for migratory birds
- Two separate flocks of roosting gulls observed during site visit:
 - ~300-400 individuals observed on a small island on the Penobscot River near downtown Old Town
 - ~300-400 individuals observed at Perch Pond



Site Visit Map









Deterrence Strategies

Implemented from September-December during expected peak gull presence:

- Reduce area of non-covered, open waste;
- Maintain depredation permit;
- Install bird roosting deterrents on perching areas;
- Install non-lethal auditory hazing devices (e.g., zon gun);
- Conduct additional site visits to assess gull abundance at JRL in winter and spring.

Landfill Design

Landfill Size

- Currently 122
 acres
- Will be 180 acres
- Property is 780 acres



Water levels in till

 Cutting into water table requires construction of an underdrain system



Expansion's 4-foot thick Dual-Liner System

Can't compact soil that's too wet



Bedrock

- Minimal disturbance within 5' of bedrock
- Added augmented layer over bedrock outcrops



Augmented Liner



Base Grade

- Cuts into till
- Deeper cuts mean
 more volume
- More volume means less area



Access Road

- East side paved for truck access
- West side is gravel very little traffic



Leak Detection and Leachate Collection



Expansion's 4-foot thick Dual- Liner System



Leak Detection and Leachate Collection

- HELP Model to determine
 flows
- Hydrocad to add in a big storm
- Required to space pipes to keep < 1' of head on the liner (in the sand)
- We keep the flow in the geocomposite head is <1/4"
- Pipe strength calculations



Pipe and Filter Stone Calculations

- Size pipe for flow rate
- Perforations vs.
 Drainage stone
- Drainage vs.
 Filter stone
- Filter vs. Sand



Leachate Tank Size

- HELP Model + storm
- Inflow Outflow = Tank size
- Outflow will be into the PFAS Treatment Plant
- Will need an additional pre-treatment storage tank
- Will have a posttreatment tank also



Force main sizing

- Dual contained force main
- Multiple pump stations going into the force main
- Piping program to check force main size



- Design pump stations
- Design holes in sump pipes
- Check the sump size adequate capacity
- Check pump sizes stay the same as existing easier if one fails





Final Grades

- Location of permanent access road
- Road is <= 10%
- Proposed locations of downspouts and terraces – enough to carry rainfall
- Coordinate with catch basins and culverts
- Final cover build-up







Stormwater

- Hydrocad model outside of the landfill
- Pre- and post- development conditions
- No additional flow in post- development
- Add detention/ sedimentation ponds as needed to slow stormwater
- Check 2 year, 10 year, and 25 year 24-hour storms

Pre-Development



Post-Development



Geotechnical Design

Geotechnical Calculations:

- Stability
- Settlement
- Seismic effects
- Liquefaction
- Deformation
- Cap stability
- Cap settlement
- Cap interface friction
- Leachate tank foundation


<u>Gas Management</u>

- Calculate gas generation based on volume and type of waste to be landfilled
- Size piping to carry gas
- Check pipe strength
- Keep horizontal piping the same as current because it works
- Design condensate traps to collect condensate from the gas
- Pump condensate into the leachate collection system











JRL Thiopaq[®] Treatment System / RNG Facility / Flares



Landfill Operations

Operations Manual

- Describes method of operations
- "P" worth of appendices highlights:
 - Stormwater Plan
 - SWPPP Stormwater Pollution Prevention Plan
 - Erosion Control Plan
 - Cell Development Plans
 - Environmental Monitoring Plan
 - Gas Monitoring Plan
 - Geotechnical Monitoring Plan
 - Inspection Forms

Operations Basics:

- 5-foot "soft layer" of waste placed on the leachate sand to protect the liner system MSW bypass, fines, sand, or bark mulch
- 5-foot-thick waste layers
- Compact with 3 passes (back and forth) or more from compactor
- Compactors weigh over 60 tons
- Use "high strength waste" in the outer 50 feet for strong slopes
 - Construction and demolition debris
 - Oversized bulky waste
 - NOT straight sludge or other waste that can't be stacked
- Open as little area as possible each day

Operations Basics:

- Daily Cover all open areas every night:
 - Soil or
 - Construction fines or
 - Foam
- Add plastic temporary cap as soon as possible
- Place final cover after some settlement has occurred
- Cover helps to limit -
 - Odor
 - Vectors (seagulls)
 - Infiltration (temporary and permanent cap)



Access road maintenance:

- Sweeping
- Water truck
- Plowing
- Grading of gravel access road as needed



Install Gas Management System

- Horizontal gas collection
 - Install gas collection pipes every 40 feet vertically, 60-100 feet horizontally – not typical at all landfills
- Vertical gas collection
 - Install as landfill reaches final grades
- Everything ties into the active (vacuum) collection system
- Treated for odor
- Made into Renewable Natural Gas



<u>Operations Manual with "P" worth of</u> <u>appendices</u>

- <u>Highlights</u>:
 - Stormwater Plan
 - SWPPP Stormwater Pollution Prevention Plan
 - Erosion Control Plan
 - Cell Development Plans
 - Environmental Monitoring Plan
 - Gas Monitoring Plan
 - Geotechnical Monitoring Plan
 - Inspection Forms

Stormwater Management Plan

- Describes model input:
 - Pre- and Post-Development Conditions
 - Soils
- <u>Design of management structures</u>:
 - Ditches and linings
 - Catch Basins
 - Culverts
 - Stormwater Detention Ponds
 - Rip rap size
 - Downspouts, etc.
- Briefly describes the erosion control:
 - Seeding, mulching
 - Silt fence
 - Erosion control mix, etc.



Erosion and Sedimentation Control Plan

- Based on Maine's Erosion and Sedimentation Control Best Management Practices (BMPs)
- Describes locations of all stormwater control structures:

 Culverts 	Catch Basins	Ditches
 Downspouts 	Inlets, Outlets	Terrace Drains
 Rip rap 	Plunge pools	Check dams
 Silt fence 	Hay bales	Seeding & mulching
 Detention ponds 		Emergency spillways

• Included in each construction project, too

<u>SWPPP – Stormwater Pollution</u> <u>Prevention Plan</u>

- Inspect potential pollutant sources and collect outfall samples quarterly
- Check samples for odor, color, sheen, and sediment after storm events
- Make sure drainage structures are working (not clogged)
- Document findings
- Update when stormwater control structures change



Environmental Monitoring Plan

- Monitoring Locations
- Parameters and Frequency of Analysis
- Sampling Procedures
- Sampling Equipment, Decontamination, and Calibration
- Sample Management
- Quality Assurance/Quality Control Procedures
- Reporting Requirements for the Facility



Proposed monitoring locations:

- 56 groundwater wells
- 6 pore water locations
- 6 surface water locations
- 2 stormwater locations
- 18 underdrains
- 8 leak detection locations
- 1 leachate tank

= 97 total test locations



Current Monitoring Locations



Cell Development Plans































CELL 22 to TOP





<u>Gas Monitoring Plan –</u>

- 220+ active well heads
- Monitored at least monthly
- Monitoring is by a 3rd party company
- System is expanded as cells are filled

Active well heads include:

- Vertical Gas Wells
- Horizontal Gas Collection Trenches
- Other collectors (connections to the leachate system, additional odor pipes, etc.)



- Gases measured include:
 - Methane
 - Oxygen
 - Carbon Dioxide
 - Balance Gas (primarily nitrogen)
- Adjustments are made to the amount of vacuum to optimize the quality of the gas going to the RNG facility
- Adjustments help minimize odor
- Inspect general condition of monitoring locations; JRL makes any needed repairs



<u>Geotechnical</u> <u>Monitoring Plan</u>

- Annual on-site inspection
- Look for evidence of slope instability, slope movement, excessive settlement
- Operational and 30year post-closure periods



<u>Geotechnical Inspections include:</u>

- Observe active waste slopes for cracking, sloughing, displacement, toe bulging/heaving, or seepage
- Observe interim and permanently covered slopes for the list above PLUS areas of stressed vegetation
- Look for any ponded water or surface depressions
- Survey the surface and compare it to the previous year's surface
- Review of waste types, quantities, and placement methods to make sure the plan is being followed





Sound Level Assessment

Sound Level Assessment

- Follows Maine Solid Waste Rules
- Modeling worst case (everything running at once)
- Modeled sound levels from:
 - Stationary sources
 - (Thiopaq plant, RNG plant, PFAS plant estimated)
 - Equipment on the landfill compactors, bulldozers, off-road trucks
 - Does not include on-road vehicles,
 - unless they are parked > 1 hour
 - Back-up alarms, but JRL does use special noise-reduced alarms

Measured in decibels (dB) which is sound pressure

- Logarithmic, so the math is weird
- How we hear things:
 - 3 dB change is just perceptible to the average person
 - 5 dB change is clearly noticeable
 - 10 dB change is described as twice or half as loud
- Sounds are not additive
 - Ex: 50 dB + 50 dB = 53 dB
- If one source >= 10 dB louder than another, then the total sound level = the higher source
 - Ex: 60 dB + 47 dB = 60 dB



	Modeled, dBA	
Open Hours	6am-7am	7am-5pm
Location	Night	Day
1R	44	47
2R	41	47
3R	39	46
1PL	46	19
2PL	38	53
3PL	42	60
4PL	36	46
5PL	<mark>45</mark>	<mark>46</mark>
7PL	50	50
8PL	46	47
9PL	50	50
10PL	<mark>65</mark>	<mark>65</mark>
11PL	<mark>58</mark>	<mark>58</mark>
12Pl	<mark>38</mark>	<mark>39</mark>
Allowable	50/ <mark>75</mark>	60/ <mark>75</mark>



Allowable = residential/commercial

Night time is limited to one compactor

No change expected in comparison to existing conditions


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Questions?





- Also consider the pitch or tone in Hertz (Hz)
- A-weighted sound levels emphasize middle frequency sounds; de-emphasize low and high frequency sounds - dBA
- Look at the percentage of time a sound level is exceeded
- Considered ambient sound: bulldozers and trucks on-site, backup alarms, vehicles on I-95 and on other local roads, wind, dogs, rustling vegetation, occasional distant aircraft, frogs, insects, and birds



Measured for 8 days

	Measure	ed, dBA	Hours Exceeded	
Site	Night	Day	Night	Day
	7pm-	7am-	7pm-	7am-
Hours	7am	7pm	7am	7pm
1	23-46	34-60		
2	24-47	30-63*		
3	46-64	53-73	53	64
Allowable	50	60		

Allowable level at protected residential locations



*After JRL closed for the night