

Maine Department of Transportation
Highway Program

GEOTECHNICAL 100 SERIES REPORT

Route 16
Dallas Plantation, Maine
Rangeley, Maine

Prepared by:
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Franklin County

WIN 19164.00

Soils Report # 2012-116

March 2, 2012

Highway Program

Brad Foley, Program Manager

Memorandum

DATE: March 2, 2012

TO: Shawn Smith

DEPT: Region 3

FROM: Scott A. Hayden

DEPT: Highway Program

SUBJECT: Final Soils: Rangeley – Dallas Plantation, Route 16, WIN 19164.00
Report # 2012-116

Project Description

A subsurface investigation has been completed for a 4.48 mile portion of Route 16 in the town of Rangeley and Dallas Plantation. The project begins at the intersection of Pleasant Street (RLM 33.49) and extends 4.48 miles northeast.

The investigation included the use of a drill rig, ground penetrating radar (GPR) and falling weight deflectometer (FWD). No stationing was available at the time of the field work so a starting station of 0+00 was designated. All station reference used for data collection was determined using a distance measuring instrument (DMI). All offsets were measured from the centerline of the existing roadway.

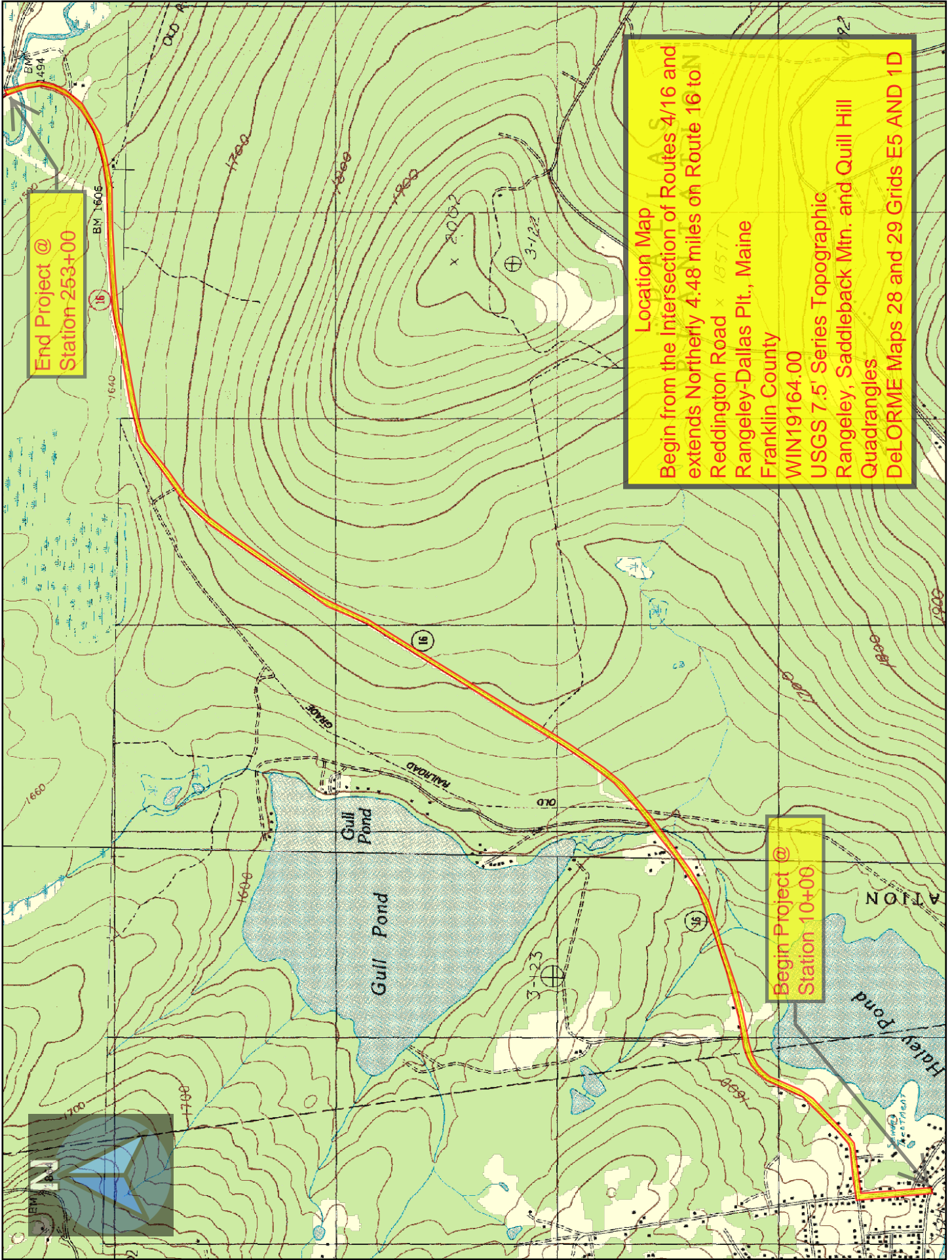
Existing Pavement Conditions

The existing roadway consists of two 10.75-foot travel lanes with 6-8 foot paved shoulders. Pavement conditions are poor with moderate to severe fatigue and longitudinal cracking. It is anticipated that poor pavement performance is due to poor drainage conditions, inadequate base thickness and quality (structure), wet subgrade soil conditions, truck / traffic loading, fatigue, frost effects, and the lack of paved shoulders.

ARAN data was collected for this project in 2010. A summary of this data is presented in Table 1. A complete listing of the ARAN data is provided on the attached Pavement Performance Assessment Summary (PPAS).

Table 1: Summary of 2010 ARAN Pavement Data

ARAN Pavement Data	Range	Average
Pavement Condition Rating (PCR)	1.07 – 2.89	2.02
International Roughness Index (IRI)	166 - 386	294
Rut Depth (left)	0.2" – 0.6"	0.36"
Rut Depth (right)	0.2" – 0.3"	0.18"



**End Project @
Station-253+00**

**Begin Project @
Station 10+00**

Location Map
 Begin from the Intersection of Routes 4/16 and
 extends Northerly 4.48 miles on Route 16 to N
 Reddington Road x 1857 F
 Rangeley-Dallas Plt., Maine
 Franklin County
 WIN19164.00
 USGS 7.5' Series Topographic
 Rangeley, Saddleback Mtn. and Quill Hill
 Quadrangles
 DeLORME Maps 28 and 29 Grids E5 AND 1D

Map Scale 1:24000

The Maine Department of Transportation provides this publication for information only. Reliance upon this information is at user risk. It is subject to revision and may be incomplete depending upon changing conditions. The Department assumes no liability if injuries or damages result from this information. This map is not intended to support emergency dispatch. Road names used on this map may not match official road names.

Pavement Condition Rating (PCR)

PCR is defined as the composite condition of the pavement on a roadway. The PCR is compiled from the severity and extent of pavement distresses such as cracking, rutting, and ride quality. The rating system uses a scale of 5.00 (perfect) to 0.00 (fully deteriorated). The PCR is the condition of the pavement only, not necessarily a reflection of the condition of the roadway base structure (See Table 2).

Table 2: Pavement Condition Rating (PCR) Description

Scale Value	Scale Rating	Description
5	Excellent	New or nearly new pavements. Free of cracks, patches or rutting.
4	Good	Pavements exhibit little to no visible signs of surface deterioration. Evidence of initial cracking or rutting.
3	Fair	Visible defects including moderate cracking, distortion and rutting. Some patching may now be present.
2	Poor	Pavement deterioration consisting of advanced cracking and severe distortion. Extensive patching and rutting also present.
1	Very Poor	Extremely deteriorated pavements. Defects include severe cracking, distortion, rutting and typically very extensive patching.

The PCR rating for this project ranges from 1.07 – 2.89 with an average PCR of 2.02. The lowest PCR values (1.07) were encountered between stations 80+00 – 101+00.

International Roughness Index (IRI)

Ride quality is expressed in terms of International Roughness Index (IRI) and is measured in inches per mile. IRI is a measurement of the inches of vertical displacement experienced by a vehicle in a mile of roadway. The lower the IRI, the smoother the ride will be (See Table 3).

Table 3: IRI Rating Scale

IRI Value (In./mile)	Ride Rating
< 100	Good Ride
100 - 170	Fair Ride
> 170	Poor Ride

The IRI value for this project ranged between 166 - 386 in/mile with an average IRI value of 294 in/mile. The poorest IRI values were encountered between stations 80+00 – 101+00

Wheel Path Rutting Values

Wheel path rutting values are measured in inches and are presented in the ARAN pavement data every 50 feet. Rutting depths ranged between 0.2” – 0.6” in the inside wheel path and 0.2” – 0.3” in the outside wheel path. The worse rutting was encountered in the inside wheel path between stations 80+00 – 139+00.

ARAN Data Conclusions

A complete listing of the ARAN data is presented in the Pavement Performance Assessment Summary (PPAS). The poorest PCR, IRI, and Rutting values have been shaded on this listing to highlight the poorest performing areas along the project. Based upon the ARAN data the poorest performing area on the project is between stations 80+00 – 139+00.

FWD Analysis

The existing pavement performance and subgrade conditions are very poor along this project. No project specific traffic data was available for the FWD analysis. The FWD analysis was conducted using traffic data from project 10177.00 Coplin Plantation (2001). An 18-kip P2.5 value of 219 was used. Future ESAL's were calculated based on a 12 year design (959,220). Pavement depths used for DARWin analysis were taken from Ground Penetrating Radar Summary sheets. A summary of the FWD analysis is shown in Table 4.

Table 4: Summary of FWD Analysis

Design Variables	% Fail	Range	Average	75 Percentile
Existing SN Fails to Meet Future SN	92%			
Pavement Modulus (psi)		23,426 – 181,223	71,084	48,320
Subgrade Resilient Modulus (psi)		1,896 – 8,073	3,388	2,640

Structural Number - The existing structural number fails to meet the future traffic structural number for 92% of this project (See attached FWD summary sheets).

Subgrade Resilient Modulus – Subgrade Resilient Modulus values range between 1,896 psi and 8,073 psi. A subgrade resilient modulus of 2,640 psi represents the 75th percentile. This value for the 75th percentile is very low and is atypical. This value may indicate the possibility of problematic subgrade soil conditions throughout the project area. See attached FWD summary sheets.

Very low (<3000psi) subgrade resilient modulus values (Mr) were encountered throughout most of this project. It is anticipated that these low values are due to the presence of moist to wet, moisture sensitive, silty till subgrade soils. The design and construction of this project must take these low Mr values into consideration. These low Mr values could create long term challenges in meeting future pavement performance expectations and could result in short term construction issues. Depending on the subgrade conditions at the time of construction, the roadway may be at high risk of failure, due to the pumping of subgrade soils, once the pavement is removed and the roadway is subjected to traffic loading. As a result, additional base material could be necessary throughout extended portions of this project in order to support traffic while the roadway remains unpaved. The areas of greatest concern are listed in Table 5 below.

Table 5: Areas of Low Subgrade Resilient Modulus Values

9+00 – 11+00	71+50 – 98+50
24+00 – 31+00	104+00 – 136+50
36+50 – 44+00	166+50 – 174+00
49+00 – 53+50	176+50 – 178+50
56+50 – 66+00	186+50 – 188+50

Boring/Coring/GPR Information

The purpose of the subsurface investigation is to obtain subsurface soil, bedrock, and ground water information. Subsurface explorations were conducted by Maine DOT using a CME 45C truck mounted drill rig. Bore hole logging was performed by Maine DOT.

A total of 10 power augers borings were conducted along the project (See Boring Logs). Power auger borings were conducted using 5" solid stem augers. Boring locations were determined based upon FWD deflection results and visual observations made during an on-site visit. Soils were described and sampled from the auger flights.

A total of 10 soil samples were collected from the power auger borings and tested at the Maine DOT Materials and Testing laboratory, located in Bangor Maine. Grain size and water content testing was conducted on each sample. Based upon laboratory test results, soil samples were classified according to the Unified Classification System, AASHTO Soil Classification and Maine DOT Frost Susceptibility Rating. Testing results are summarized on the attached Laboratory Testing Summary Sheet.

Existing HMA Thickness

Existing pavement thickness estimates have been provided using pavement core data, power auger boring data, and ground penetrating radar (GPR) data. See Table 6 for a summary comparison of existing pavement thickness estimates derived from coring/boring data and the GPR data.

Coring/Auger Data – Twenty-eight pavement cores and 10 power auger borings were used to physically measure the existing pavement thickness. Pictures of the pavement cores have been included at the back of this report.

GPR Data – Pavement thickness estimates were developed using Geophysical Survey Systems Inc. (GSSI) RADAN GPR Data Processing Software. Where available, pavement thicknesses from pavement cores were used in developing the estimated GPR pavement thicknesses. GPR data was collected in the left and right wheel path of both the East and West bound lanes. Data was collected at high speed using an air launch antenna at 1 foot intervals along the entire project. This information has been consolidated to provide an average pavement thickness estimate every 100 feet (See attached GPR Pavement Thickness Estimates).

Table 6: Pavement Thickness Summary/Comparison

	Left Lane	Right Lane
Pavement Core/Auger Data		
Range of Thickness	5.0" – 10.0"	5.5" – 8.5"
Average Thickness	6.6"	6.1"
Ground Penetrating Radar Data		
Range of Thickness	3.6" – 9.9"	
Average Thickness	6.4"	

Existing Roadway Base

Existing Base Material Type:	silty gravelly SAND, A-1-b gravelly silty SAND, A-1-b, A-2-4
Percent Passing #200:	17% - 26%
Range of Base Material Thickness:	8" – 22"
Average Thickness:	13"
Quality of Drainage (AASHTO):	poor
Permeability:	0.5' – 3' per day

The existing roadway base generally consists of silty gravelly SAND and gravelly silty SAND. These materials are classified as (AAASHTO) A-1-b and A-2-4 soils. Percent passing the #200 sieve ranged from 17% - 26%. Due to the relatively high silt content these materials are moderately frost susceptible.

The estimated permeability of this material has been calculated to be 3' per day using grain size distribution curves from obtained samples. This permeability value results in a "poor" quality of drainage rating (1993, AASHTO Guide for Design of Pavement Structures). As a comparison, a base material meeting the "excellent quality of drainage" criteria provides a minimum permeability of 1000 ft/day.

Design and construction decisions should consider the marginal drainage characteristics and thickness of the existing base when developing performance expectations related to strength and drainage. These considerations must also take into account that a very low subgrade modulus was encountered throughout much of this project.

Existing Shoulder Base

Two power auger borings were conducted within the shoulders to examine the existing shoulder base. Based upon limited boring information the existing shoulder base information is as follows:

Existing Shoulder Base Material Type:	gravelly silty SAND
Percent Passing #200:	20% - 26%
Range of Base Material Thickness:	12" – 14"
Average Thickness:	13"
Quality of Drainage (AASHTO):	poor
Permeability:	0.5' – 3' per day

Subgrade Soils

Based upon power auger boring data, subgrade soils consist primarily of moist to wet gravelly sandy SILT. Native soils are mapped (Soils Conservation Survey, Parent Material Soils Map) primarily as glacial till. These soils are classified (AASHTO) as A-4 soils and are highly frost susceptible.

These soils can perform adequately as a subgrade soil if they are properly compacted and drained. However, these soils will swell and lose much of their stability if they are not properly compacted and drained. Currently these soils are poorly drained and are not performing well (See Boring Logs and FWD Summary Sheets). Very low (<3000 psi) subgrade resilient modulus values were encountered throughout much of this project. If these soils are not well drained premature pavement failure is likely to result. In addition, if these soils are not well drained at

the time of construction, roadway failure may result during traffic loading once the existing pavement surface is removed. It is critical that the entire project area be well drained.

Bedrock

Limited power auger borings were conducted along this project. Borings generally penetrated 5' without encountering any refusals. FWD testing was conducted every 250' along the project. Low FWD deflections and high Mr values can indicate potentially shallow bedrock areas. Based upon the FWD data bedrock may be potentially shallow (< 6') in the vicinity of Station 68+51.

Drainage

Existing ditching is inadequate along the right shoulder and non-existent along the left shoulder. Drainage to remove surface and subsurface water is critical for the short term and long term success of this project. The native subgrade soils are moisture sensitive and will lose much of their strength when wet. FWD, Aran, and boring data indicate that these subgrade soils are poorly drained and are not performing well. Wet subgrade soil conditions were encountered in 5 of the 8 power auger borings conducted in the travel lanes. An FWD analysis indicates that the subgrade resilient modulus is very low. If wet subgrade conditions are present during construction additional base material may be necessary to support traffic during construction once the existing pavement surface is removed. Ditch construction to a minimum depth of 3' below top of pavement is recommended.

Performance Data Summary

Based upon the attached Performance Data Summary sheets, 76 % of the project fails to meet 2 or more of the four minimum performance data criteria (See attached Performance Data Summary Sheets). Pavement performance in these areas is likely to be low and the risk of failure is likely to be higher. The greatest areas of concern are listed below:

24+00 – 31+00	71+50 – 98+50
36+50 – 44+00	104+00 – 136+50
49+00 – 53+50	166+50 – 174+00
56+50 – 67+50	176+50 – 178+50
	186+50 – 188+50

The Performance Data Summary (PDS) sheets are included on the next pages. The purpose of the PDS is to identify potential performance differences by station based upon 4 minimal performance criteria obtained from subsurface exploration data and falling weight deflectometer (FWD) data.

The PDS sheets are color coded and should be printed in color to fully utilize the information. Green indicates the minimum performance criteria have been met. Red indicates the minimum performance criteria have failed to be met. The total number of failed performance criteria is presented in the deficient column (DEF) for each FWD test station.

If an area fails to meet 2 or more of the minimal performance criteria the area is shaded in the deficiency column (DEF). It is anticipated that existing pavement performance will be less in these shaded areas. In addition, the risk of future pavement failure could also be higher.

Conclusions

1. It is recommended that the need for additional structure and/or stabilization be seriously considered during ongoing design and construction deliberations.
2. Drainage to remove surface and subsurface water is critical. Ditch construction to a minimum depth of 3' below top of pavement is recommended.
3. The Performance Data Summary indicates that 76 % of the project fails to meet 2 or more of the four minimum performance data criteria. Inadequate base thickness and quality (structure), low subgrade resilient modulus and low existing structural number are the primary deficiencies. Based upon the Performance Data Summary the poorest performing areas are between the following stations:

9+00 – 11+00	71+50 – 98+50
24+00 – 31+00	104+00 – 136+50
36+50 – 44+00	166+50 – 174+00
49+00 – 53+50	176+50 – 178+50
56+50 – 66+00	186+50 – 188+50

4. Aran data indicates that existing pavement conditions are poor with moderate to severe fatigue/longitudinal cracking and rutting. The poorest performing areas based upon the Aran data are between stations 80+00 – 134+00.
5. A FWD analysis indicates very low (<3000psi) subgrade resilient modulus values (Mr) were encountered throughout most of this project. Although low Mr values can be commonly encountered in isolated areas, it is not common for these values to be low throughout the majority of a project. These low Mr values could represent long term challenges in meeting future pavement performance expectations. In addition, short term construction issues could arise in these low Mr areas. Low Mr values were encountered between the following stations:

9+00 – 11+00	71+50 – 98+50
24+00 – 31+00	104+00 – 136+50
36+50 – 44+00	166+50 – 174+00
49+00 – 53+50	176+50 – 178+50
56+50 – 66+00	186+50 – 188+50

Depending on the subgrade conditions at the time of construction, these areas could be at high risk of failure during construction once the pavement is removed and the roadway is subjected to traffic loading. Additional base material could be necessary throughout extended portions of this project in order to support traffic while the roadway is unpaved during the construction process.

Performance Data Summary

Dallas Plantation - Rangeley
19164.00

Station (FWD)	D E F	Minimum Performance Data Criteria				Boring Location (Plan View)	Base Material		Subgrade Soils	
							AASHTO Class	% #200	AASHTO Class	% #200
					KEY					
Station		Red - Fail Green - Met			Solid Pave Thick Unbound Pave - UP Base Thickness (inches)	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture	
					CL					
0+00	1									
2+53	2									
5+00	2									
7+51	2									
10+03	3					5.5 SP - 12.5	SiGSa A-1-b S1	17 II Damp	GSaSi A-4 S2	55 IV Moist
12+50	2									
15+05	2									
17+51	2									
20+00	2									
22+52	2									
25+00	3									
27+53	3									
30+02	3									
32+50	2									
35+02	2									
37+52	3									
40+01	3					5.5 - 10.1	GSiSa A-2-4 S3	26 II Damp	SiSa A-4 S4	48 III Moist
42+80	3									
45+00	2									
47+51	2									
50+08	3									
52+50	3									
55+04	2									
57+50	3									
60+04	3									

- * SP = Solid Pavement Layer
- * UP = Unbound Pavement Layer
- SP+UP = Total Pavement Thickness
- * Base Thickness = Red indicates presence of "treated base"

Performance Data Summary

Dallas Plantation - Rangeley
19164.00

Station (FWD)	D E F	Minimum Performance Data Criteria				Boring Location (Plan View)	Base Material		Subgrade Soils					
							AASHTO Class	% #200	AASHTO Class	% #200				
					KEY									
Station		Red - Fail Green - Met				Solid Pave Thick Unbound Pave - UP Base Thickness (inches)	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture				
					CL									
62+51	3													
65+02	3													
68+51	2													
70+50	2													
72+51	3													
75+00	3					6.0 SP - 8.4	GSiSa A-2-4 S3	26 II Damp	SiSa A-4 S4	48 III Moist				
77+75	3	Pavement Thickness (4 inches)	Base Thickness (18 inches)	Subgrade Modulus (3000 psi)	Structural Number									
80+02	3													
82+59	3													
85+04	3													
87+53	3													
90+01	2													
92+52	3													
95+27	3													
97+56	3									7.0 SP - 8.6	GSiSa A-1-b S5	20 II Damp	SaSi A-4 S6	60 IV Wet 1.3'
100+00	2													
102+51	2													
105+03	3													
107+54	3													
110+00	2													
112+53	3													
115+02	3													
117+52	3													
120+01	3													
122+60	3													

- * SP = Solid Pavement Layer
- * UP = Unbound Pavement Layer
- SP+UP = Total Pavement Thickness
- * Base Thickness = Red indicates presence of "treated base"

Performance Data Summary

Dallas Plantation - Rangeley
19164.00

Station (FWD)	D E F	Minimum Performance Data Criteria				Boring Location (Plan View)	Base Material		Subgrade Soils	
							AASHTO Class	% #200	AASHTO Class	% #200
					KEY					
Station		Red - Fail Green - Met				Solid Pave Thick Unbound Pave - UP Base Thickness (inches)	Soil Type AASHTO Sample #	% 200 Frost Moisture	Soil Type AASHTO Sample #	% 200 Frost Moisture
					CL					
125+00	3					6.0 SP - 8.4	SiGSa A-1-b S7	21 II Damp	GSaSi A-4 S8	49 III Wet 1.2'
127+53	2									
130+00	3									
132+50	2									
135+01	3									
137+51	2									
140+00	2									
142+51	2									
145+01	2									
147+54	2									
150+01	2					6.0 SP - 13.2	SiGSa A-1-b S7	21 II Damp	GSaSi A-4 S8	49 III Wet 1.6'
152+55	2									
155+01	2									
157+52	2									
160+00	2									
163+01	2									
165+01	2									
167+53	3									
170+01	3									
172+51	3									
175+01	1					5.5 SP - 22.1	SiGSa A-1-b S7	21 II Damp	GSaSi A-4 S8	49 III Wet 2.3'
177+50	3									
180+01	1									
182+56	1									
185+13	1									
187+50	3									

- * SP = Solid Pavement Layer
- * UP = Unbound Pavement Layer
- SP+UP = Total Pavement Thickness
- * Base Thickness = Red indicates presence of "treated base"

Rangeley - Dallas Plantation Route 16

19164.00

ARAN DATA

Station	RLM	Inv	Yr	PCR < 3.5	IRI > 150	Rut Depth > 0.5"	
						Left (in.)	Right (in.)
0+00	33.49	2010		2.16	336	0.4	0.2
0+53	33.5	2010		2.16	336	0.4	0.2
1+06	33.51	2010		2.16	336	0.4	0.2
5+28	33.59	2010		2.16	336	0.4	0.2
5+81	33.6	2010		2.16	336	0.4	0.2
6+34	33.61	2010		2.16	336	0.4	0.2
6+86	33.62	2010		2.16	336	0.4	0.2
11+62	33.71	2010		2.16	336	0.4	0.2
12+14	33.72	2010		2.16	336	0.4	0.2
14+26	33.76	2010		1.89	307	0.4	0.2
15+31	33.78	2010		1.89	307	0.4	0.2
15+84	33.79	2010		1.89	307	0.4	0.2
18+48	33.84	2010		1.89	307	0.4	0.2
20+06	33.87	2010		1.89	307	0.4	0.2
30+10	34.06	2010		1.89	307	0.4	0.2
30+62	34.07	2010		1.89	307	0.4	0.2
31+68	34.09	2010		1.89	307	0.4	0.2
32+21	34.1	2010		1.89	307	0.4	0.2
32+74	34.11	2010		1.89	307	0.4	0.2
33+26	34.12	2010		1.89	307	0.4	0.2
35+90	34.17	2010		1.89	307	0.4	0.2
38+02	34.21	2010		1.89	307	0.4	0.2
38+54	34.22	2010		1.89	307	0.4	0.2
39+60	34.24	2010		1.89	307	0.4	0.2
40+66	34.26	2010		1.89	307	0.4	0.2
42+24	34.29	2010		1.89	307	0.4	0.2
48+05	34.4	2010		1.87	362	0.4	0.2
62+30	34.67	2010		1.87	362	0.4	0.2
63+36	34.69	2010		1.87	362	0.4	0.2
69+70	34.81	2010		1.87	362	0.4	0.2
70+22	34.82	2010		1.87	362	0.4	0.2
76+56	34.94	2010		1.87	362	0.4	0.2
77+09	34.95	2010		1.87	362	0.4	0.2
80+78	35.02	2010		1.07	386	0.6	0.3
100+32	35.39	2010		1.07	386	0.6	0.3
100+85	35.4	2010		1.07	386	0.6	0.3
112+99	35.63	2010		1.45	300	0.5	0.1
115+10	35.67	2010		1.45	300	0.5	0.1
136+75	36.08	2010		1.45	300	0.5	0.1
138+34	36.11	2010		1.45	300	0.5	0.1

Station	RLM	Inv Yr	PCR < 3.5	IRI > 150	Rut Depth > 0.5"	
138+86	36.12	2010	1.45	300	0.5	0.1
145+20	36.24	2010	1.66	302	0.3	0.2
147+84	36.29	2010	1.66	302	0.3	0.2
154+70	36.42	2010	1.66	302	0.3	0.2
167+90	36.67	2010	1.66	302	0.3	0.2
168+96	36.69	2010	1.66	302	0.3	0.2
177+41	36.85	2010	2.05	292	0.2	0.2
178+46	36.87	2010	2.05	292	0.2	0.2
196+94	37.22	2010	2.05	292	0.2	0.2
209+62	37.46	2010	2.89	166	0.2	0.1
219+65	37.65	2010	2.89	166	0.2	0.1
220+18	37.66	2010	2.89	166	0.2	0.1
220+70	37.67	2010	2.89	166	0.2	0.1
221+23	37.68	2010	2.89	166	0.2	0.1
224+93	37.75	2010	2.89	166	0.2	0.1
225+46	37.76	2010	2.89	166	0.2	0.1
226+51	37.78	2010	2.89	166	0.2	0.1
227+57	37.8	2010	2.89	166	0.2	0.1
230+74	37.86	2010	2.89	166	0.2	0.1
236+54	37.97	2010	2.89	166	0.2	0.1

February 10, 2012

Falling Weight Deflectometer (FWD) Summary Sheet

Project #: 19164.00
Town(s): Rangeley/Dallas Plantation
Route(s): #16
Date Tested: 10/11/2011
Requested By: S Hayden
Direction of Testing: West to East

# Of FWD tests: 92	# Of Power Augers/Spoons - 11
Design Life: 12	Future 18-kip ESALs (Design Life): 959,220
Initial Serviceability: 4.5	Terminal Serviceability: 2.5
Reliability Level: 90%	Overall Standard Deviation: .45

Locations

Station (Feet)

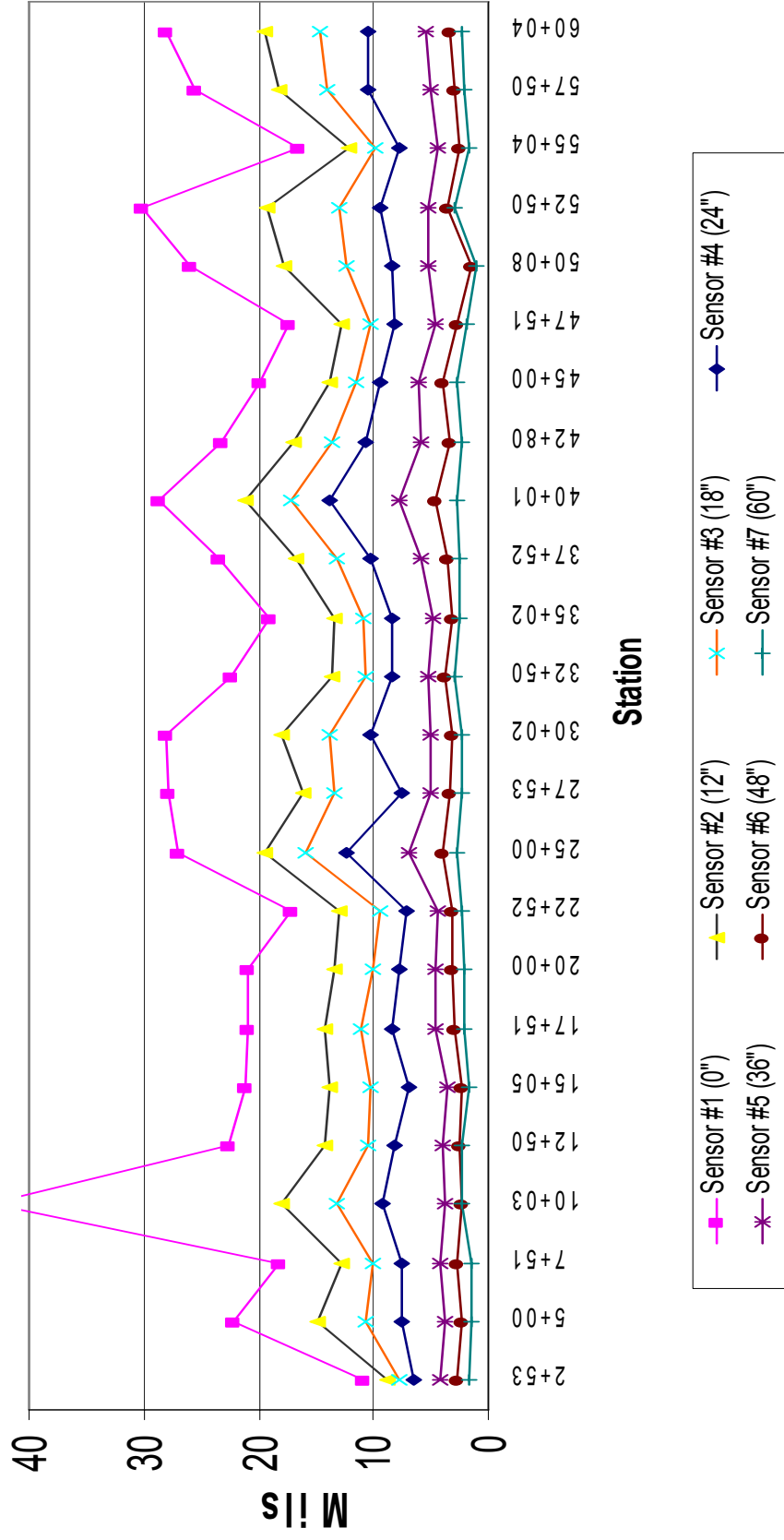
Description

Comments:

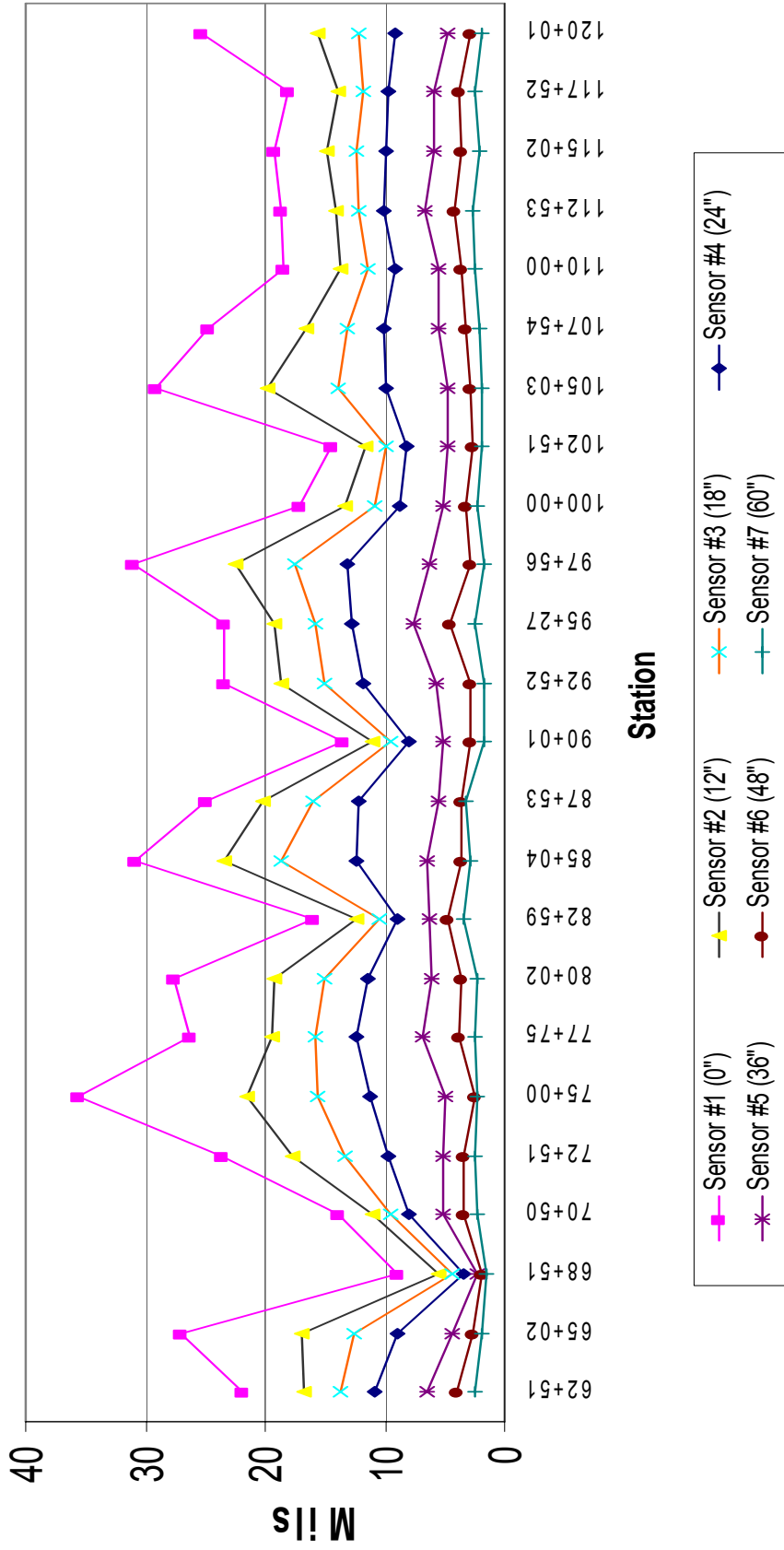
No project specific traffic data was available for this project at the time of the FWD analysis. Traffic data from project 10177.00 Coplin Plantation (2001) was considered the best available representative information. The 18-kip P2.5 value was 219. Future ESAL's were calculated for a 12 year design (959,220).

Pavement depths used for DARWin analysis were taken from Ground Penetrating Radar Summary sheets.

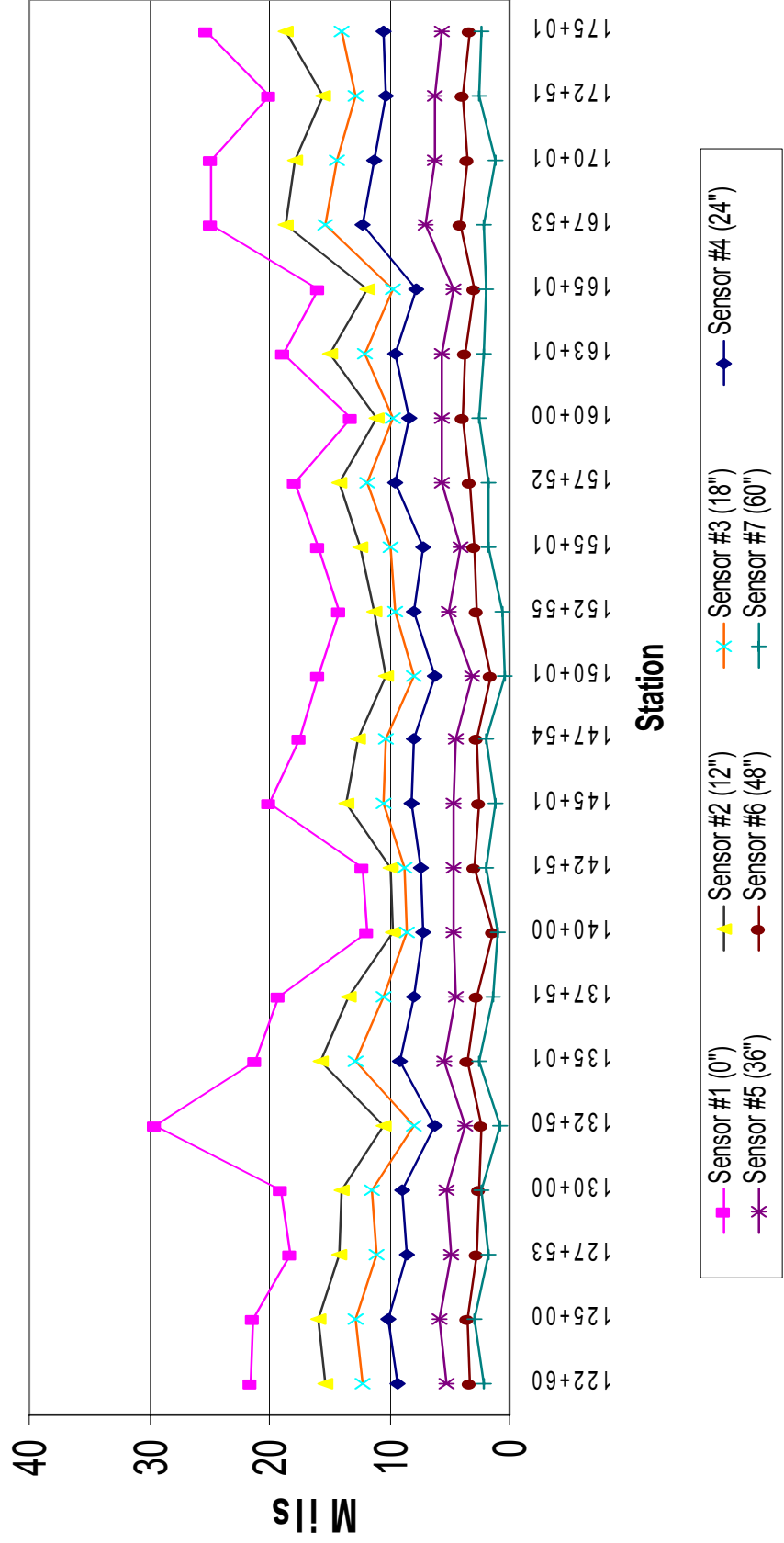
19164.00 Rangeley/Dallas Plt. Route #16



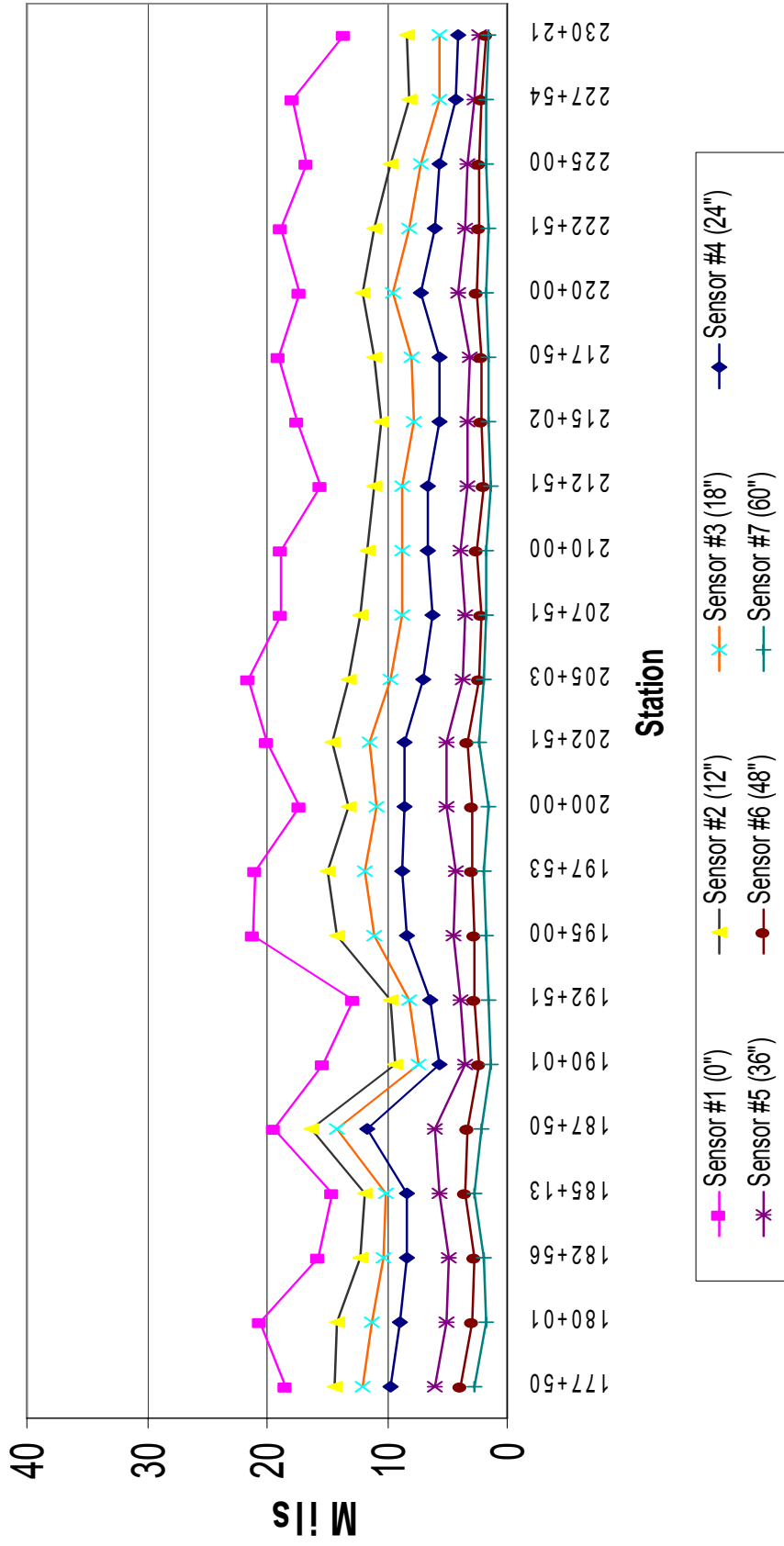
19164.00 Rangeley/Dallas Plt. Route #16



19164.00 Rangeley/Dallas Plt. Route #16



19164.00 Rangeley/Dallas Plt. Route #16



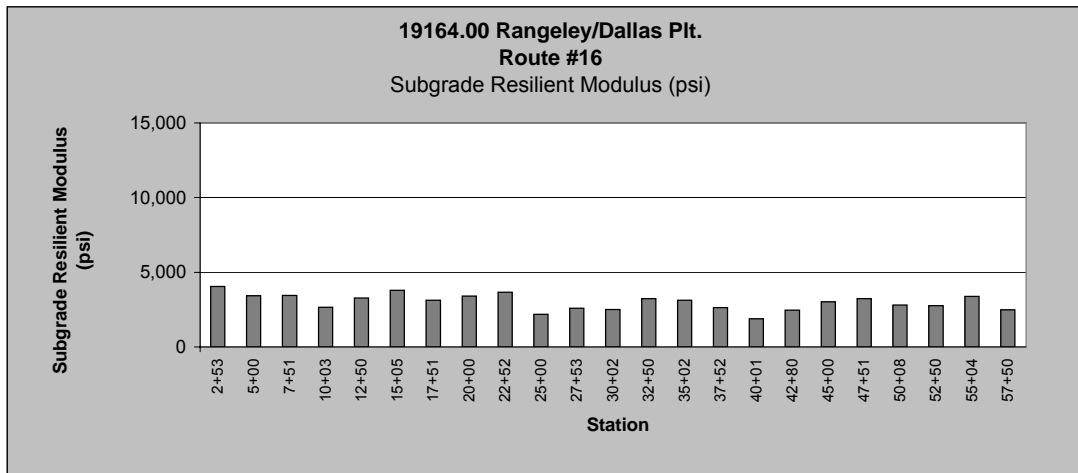
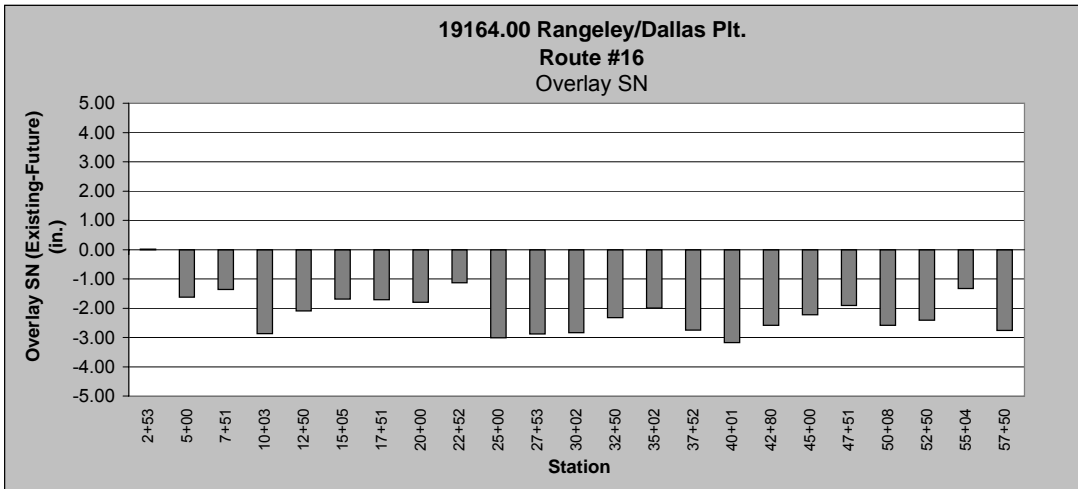
**19164.00 Rangeley/Dallas Plantation
Route #16**

Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	Combined Pavement/Gravel Depth Used for Calculation (in)
2+53	4.18	4.16	0.02	-	169,230	4,059	5.5	16.8
5+00	2.78	4.40	-1.62	3.68	57,307	3,436	4.7	16.0
7+51	3.03	4.39	-1.36	3.09	74,276	3,448	5.3	16.6
10+03	1.92	4.79	-2.87	6.52	23,426	2,647	3.6	14.9
12+50	2.38	4.47	-2.09	4.75	44,955	3,269	3.6	14.9
15+05	2.57	4.26	-1.69	3.84	52,008	3,783	4.0	15.3
17+51	2.83	4.54	-1.71	3.89	71,173	3,121	3.9	15.2
20+00	2.61	4.41	-1.80	4.09	54,386	3,399	4.0	15.3
22+52	3.17	4.30	-1.13	2.57	88,354	3,673	4.5	15.8
25+00	2.07	5.08	-3.01	6.84	53,478	2,196	4.7	12.2
27+53	1.94	4.82	-2.88	6.55	45,204	2,602	4.6	12.1
30+02	2.03	4.87	-2.84	6.45	48,314	2,516	4.9	12.4
32+50	2.17	4.49	-2.32	5.27	57,215	3,234	5.0	12.5
35+02	2.54	4.53	-1.99	4.52	121,694	3,129	3.9	11.4
37+52	2.05	4.80	-2.75	6.25	56,180	2,632	4.4	11.9
40+01	2.15	5.32	-3.17	7.20	45,544	1,896	5.9	13.4
42+80	2.31	4.90	-2.59	5.89	59,106	2,461	5.7	13.2
45+00	2.37	4.59	-2.22	5.05	59,217	3,022	6.0	13.5
47+51	2.57	4.48	-1.91	4.34	69,352	3,237	6.4	13.9
50+08	2.10	4.69	-2.59	5.89	37,598	2,817	6.4	13.9
52+50	2.32	4.73	-2.41	5.48	47,804	2,754	6.7	14.2
55+04	3.09	4.42	-1.33	3.02	120,523	3,392	8.3	13.9
57+50	2.12	4.88	-2.76	6.27	43,555	2,494	8.2	13.4

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>8000)

For actual Gravel Depths, see logdraft forms - Pavement depths were taken from Ground Penetrating Radar Summary Sheet.



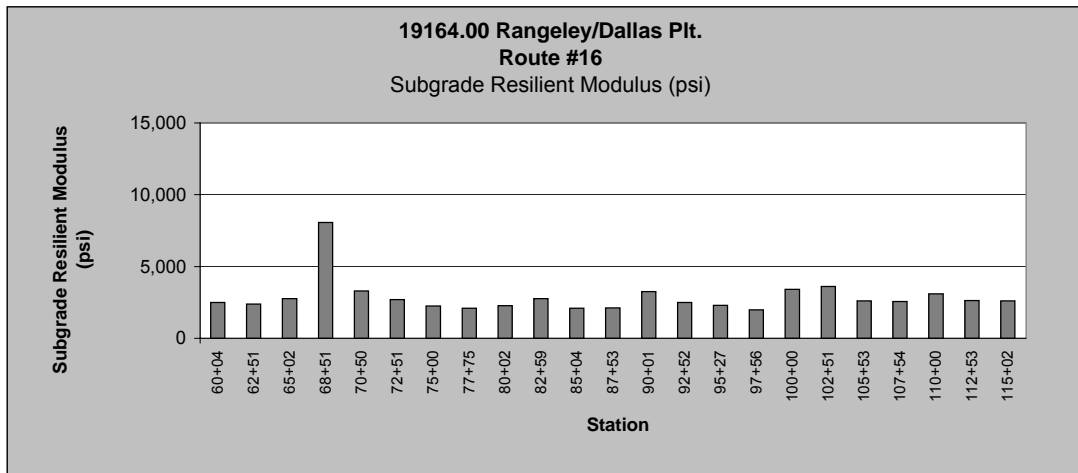
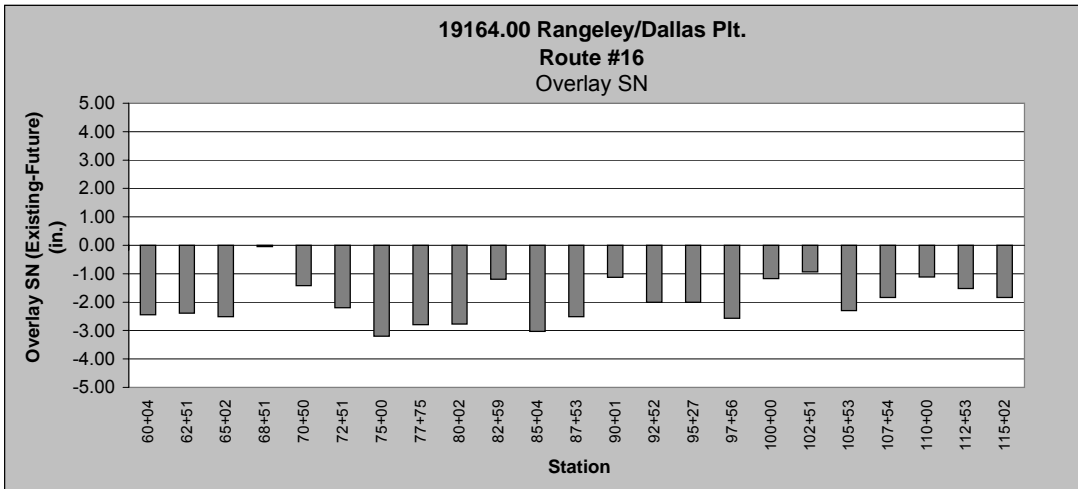
**19164.00 Rangeley/Dallas Plantation
Route #16**

Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	Combined Pavement/Gravel Depth Used for Calculation (in)
60+04	2.45	4.89	-2.44	5.55	61,204	2,489	6.3	13.8
62+51	2.56	4.95	-2.39	5.43	71,334	2,393	7.4	13.7
65+02	2.21	4.72	-2.51	5.70	51,152	2,763	7.0	13.3
68+51	3.22	3.27	-0.05	0.11	156,173	8,073	7.0	13.3
70+50	3.04	4.46	-1.42	3.23	127,953	3,288	7.1	13.4
72+51	2.56	4.76	-2.20	5.00	82,259	2,694	6.8	13.1
75+00	1.85	5.05	-3.20	7.27	30,423	2,241	6.9	13.2
77+75	2.36	5.15	-2.79	6.34	55,755	2,104	7.4	13.7
80+02	2.26	5.03	-2.77	6.30	51,638	2,268	7.3	13.6
82+59	3.53	4.72	-1.19	2.70	180,193	2,772	7.2	13.5
85+04	2.13	5.16	-3.03	6.89	39,371	2,092	7.6	13.9
87+53	2.63	5.14	-2.51	5.70	79,764	2,125	7.3	13.6
90+01	3.34	4.47	-1.13	2.57	128,322	3,258	8.4	14.7
92+52	2.86	4.87	-2.01	4.57	62,526	2,507	8.3	16.0
95+27	3.01	5.02	-2.01	4.57	64,319	2,288	9.0	16.7
97+56	2.68	5.25	-2.57	5.84	42,151	1,980	9.4	17.1
100+00	3.24	4.41	-1.17	2.66	89,111	3,415	8.4	16.1
102+51	3.40	4.33	-0.93	2.11	104,854	3,600	8.3	16.0
105+53	2.51	4.81	-2.30	5.23	43,154	2,616	8.2	15.9
107+54	3.01	4.84	-1.83	4.16	55,808	2,566	9.8	17.5
110+00	3.44	4.55	-1.11	2.52	92,535	3,097	9.2	16.9
112+53	3.28	4.80	-1.52	3.45	102,156	2,622	7.9	15.6
115+02	2.98	4.81	-1.83	4.16	106,351	2,617	6.3	14.0

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>8000)

For actual Gravel Depths, see logdraft forms - Pavement depths were taken from Ground Penetrating Radar Summary Sheet.



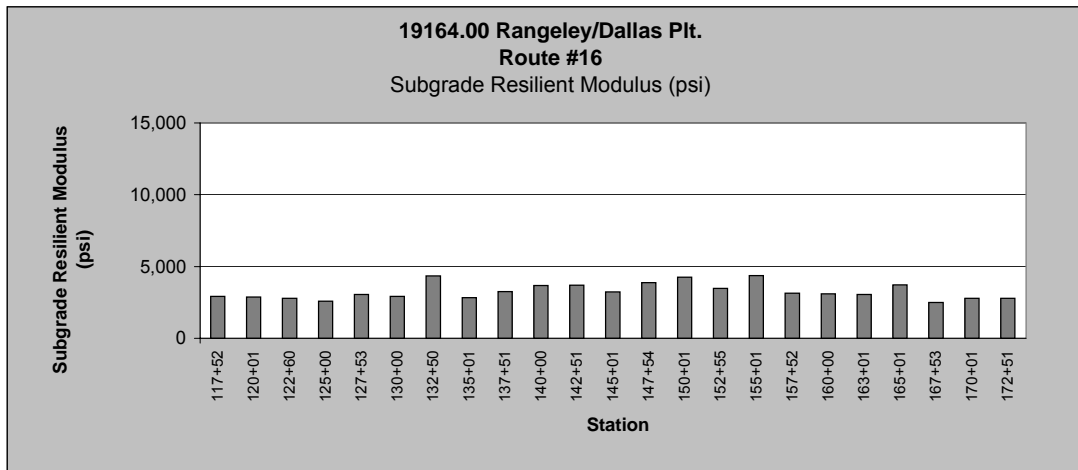
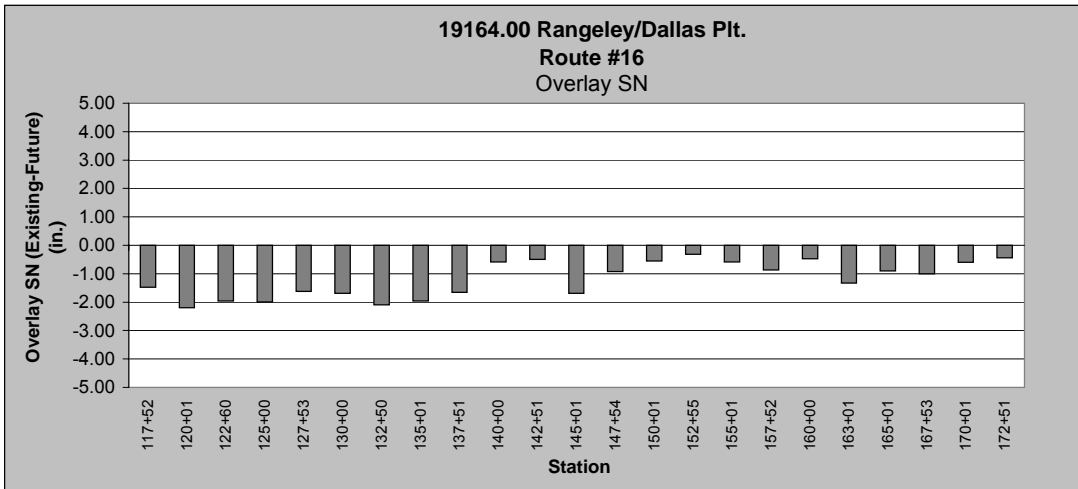
**19164.00 Rangeley/Dallas Plantation
Route #16**

Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	Combined Pavement/Gravel Depth Used for Calculation (in)
117+52	3.16	4.64	-1.48	3.36	93,357	2,921	7.8	15.5
120+01	2.46	4.66	-2.20	5.00	56,085	2,872	6.6	14.3
122+60	2.76	4.72	-1.96	4.45	79,218	2,778	6.7	14.3
125+00	2.84	4.83	-1.99	4.52	100,190	2,579	6.0	13.6
127+53	2.96	4.58	-1.62	3.68	115,866	3,043	5.9	13.5
130+00	2.94	4.63	-1.69	3.84	110,350	2,930	6.0	13.6
132+50	1.97	4.06	-2.09	4.75	31,908	4,338	6.2	13.8
135+01	2.73	4.69	-1.96	4.45	85,017	2,833	6.2	13.8
137+51	2.82	4.47	-1.65	3.75	89,954	3,261	6.4	14.0
140+00	3.72	4.30	-0.58	1.32	181,223	3,681	7.0	14.6
142+51	3.79	4.29	-0.50	1.14	170,389	3,697	7.6	15.2
145+01	2.79	4.48	-1.69	3.84	78,142	3,236	6.9	14.5
147+54	3.30	4.22	-0.92	2.09	68,705	3,879	6.0	17.9
150+01	3.54	4.09	-0.55	1.25	76,953	4,259	6.6	18.5
152+55	4.06	4.38	-0.32	0.73	109,096	3,484	7.0	18.9
155+01	3.47	4.05	-0.58	1.32	75,097	4,367	6.4	18.3
157+52	3.66	4.53	-0.87	1.98	71,692	3,139	7.7	19.6
160+00	4.08	4.55	-0.47	1.07	110,116	3,089	7.0	18.9
163+01	3.24	4.57	-1.33	3.02	68,691	3,063	5.7	17.6
165+01	3.38	4.28	-0.90	2.05	85,106	3,721	5.2	17.1
167+53	3.89	4.89	-1.00	2.27	42,306	2,490	5.0	24.8
170+01	4.11	4.71	-0.60	1.36	45,910	2,779	5.7	25.5
172+51	4.27	4.71	-0.44	1.00	51,397	2,782	5.7	25.5

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>8000)

For actual Gravel Depths, see logdraft forms - Pavement depths were taken from Ground Penetrating Radar Summary Sheet.



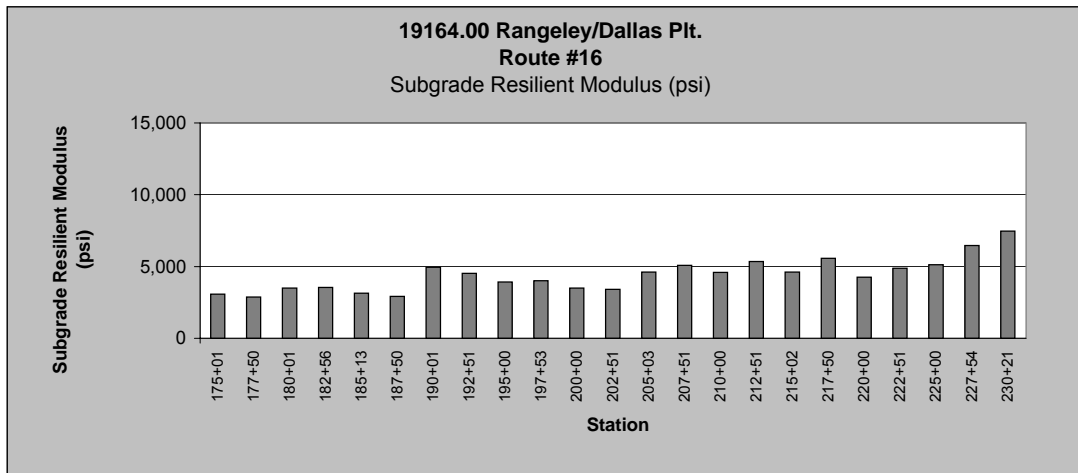
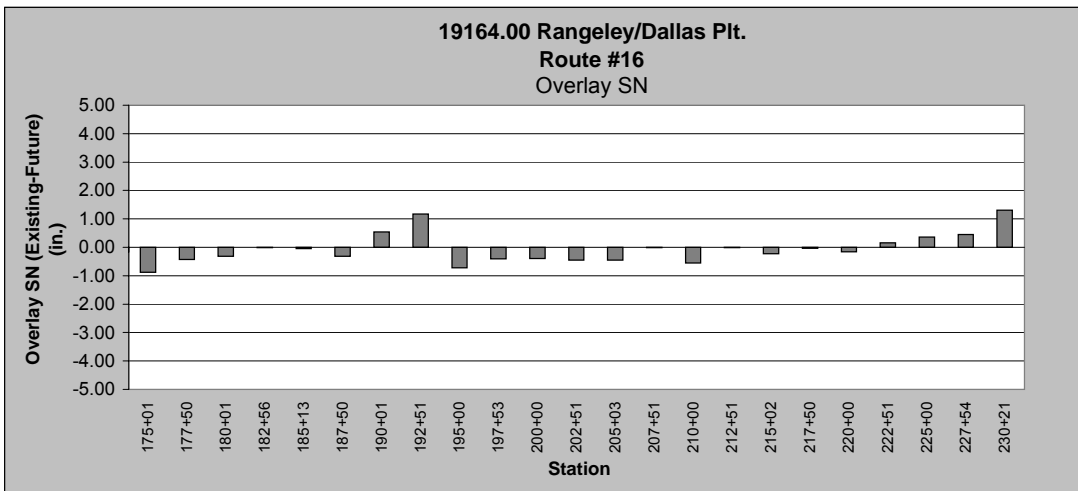
**19164.00 Rangeley/Dallas Plantation
Route #16**

Station (Feet)	Existing Structural Number (in.)	Future Traffic Structural Number (in.)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	Combined Pavement/Gravel Depth Used for Calculation (in)
175+01	3.68	4.56	-0.88	2.00	33,066	3,080	5.7	25.5
177+50	4.24	4.67	-0.43	0.98	49,861	2,867	5.8	25.6
180+01	4.05	4.37	-0.32	0.73	47,968	3,495	5.0	24.8
182+56	4.34	4.35	-0.01	0.02	56,829	3,537	5.3	25.1
185+13	4.49	4.53	-0.04	0.09	65,218	3,140	5.0	24.8
187+50	4.33	4.64	-0.31	0.70	49,498	2,914	6.4	26.2
190+01	4.42	3.88	0.54	-	51,964	4,944	6.5	26.3
192+51	5.18	4.01	1.17	-	70,908	4,516	8.0	27.8
195+00	3.49	4.21	-0.72	1.64	36,297	3,923	6.1	23.4
197+53	3.78	4.18	-0.40	0.91	50,640	4,002	5.4	22.7
200+00	3.98	4.37	-0.39	0.89	55,984	3,507	5.8	23.1
202+51	3.96	4.41	-0.45	1.02	49,811	3,415	6.6	23.9
205+03	3.53	3.98	-0.45	1.02	43,048	4,623	5.1	22.4
207+51	3.84	3.85	-0.01	0.02	52,447	5,092	5.5	22.8
210+00	3.44	3.99	-0.55	1.25	39,884	4,589	5.1	22.4
212+51	3.77	3.78	-0.01	0.02	48,859	5,347	5.6	22.9
215+02	3.75	3.98	-0.23	0.52	45,005	4,612	6.1	23.4
217+50	3.69	3.72	-0.03	0.07	40,546	5,581	6.6	23.9
220+00	3.93	4.09	-0.16	0.36	51,462	4,252	6.2	23.5
222+51	4.06	3.90	0.16	-	48,316	4,871	7.5	24.8
225+00	4.19	3.83	0.36	-	56,224	5,133	7.0	24.3
227+54	3.98	3.53	0.45	-	48,279	6,472	7.0	24.3
230+21	4.67	3.36	1.31	-	72,426	7,457	7.6	24.9

Possible Weak Soils (<3000)

Possible Shallow Bedrock (>8000)

For actual Gravel Depths, see logdraft forms - Pavement depths were taken from Ground Penetrating Radar Summary Sheet.



**19164.00 Dallas Plantation
Estimated Pavement Thickness
Ground Penetrating Radar (GPR)**

Explanation of Ground Penetrating Radar (GPR) Data Collection and Analysis:

For Project 19164.00 (Dallas Plantation), GPR data was collected in the left and right wheel path of both the East and West bound lanes. Data was collected at 1 foot intervals along the entire section. Pavement thickness estimates were developed using Geophysical Survey Systems Inc. (GSSI) RADAN GPR Data Processing Software. Where available, pavement thicknesses from pavement cores and Geotechnical borings collected by MaineDOT personnel were used in developing the estimated GPR pavement thicknesses.

**GPR pavement thickness averages are to be considered for estimating purposes only.
Actual pavement thickness may vary.**

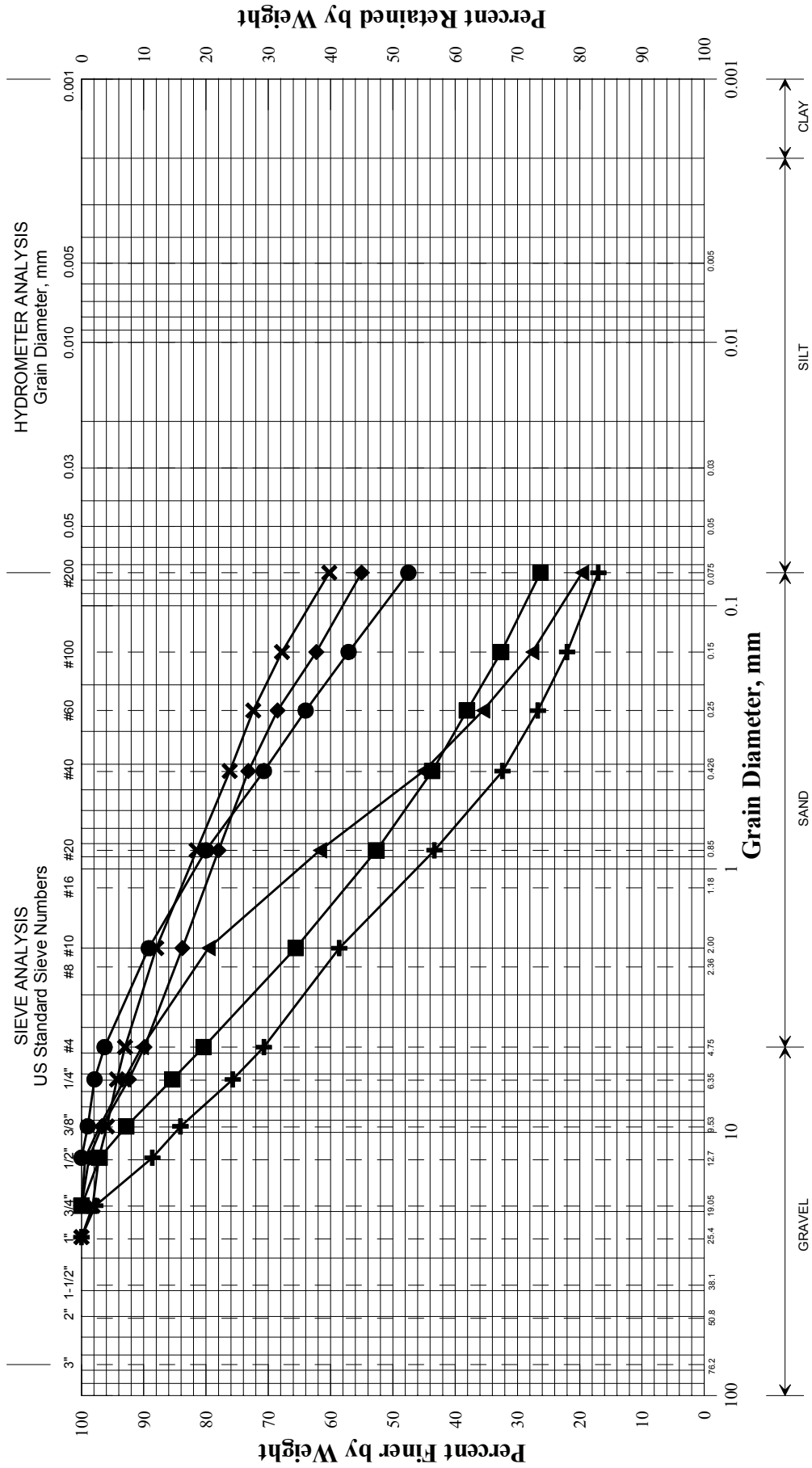
Analysis Distance (ft) -	100	Overall Average Thickness (in.)	6.4	Overall Minimum Thickness (in.)	3.6	Overall Maximum Thickness (in.)	9.9
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19164.00 Dallas Plantation

Station Limits	Average Depth (in)	Station Limits	Average Depth (in)	Station Limits	Average Depth (in)	Station Limits	Average Depth (in)
0+00	4.6	15+00	4.0	30+00	4.9	45+00	6.0
1+00	5.3	16+00	4.1	31+00	5.0	46+00	5.7
2+00	5.5	17+00	3.9	32+00	5.0	47+00	6.4
3+00	4.8	18+00	4.2	33+00	4.1	48+00	6.4
4+00	4.7	19+00	4.4	34+00	3.9	49+00	6.7
5+00	4.9	20+00	4.0	35+00	4.0	50+00	6.4
6+00	4.4	21+00	4.1	36+00	4.5	51+00	6.7
7+00	5.3	22+00	4.5	37+00	4.4	52+00	6.7
8+00	5.5	23+00	4.6	38+00	5.3	53+00	6.5
9+00	4.0	24+00	4.7	39+00	5.9	54+00	6.3
10+00	3.6	25+00	5.4	40+00	6.1	55+00	6.4
11+00	3.6	26+00	5.4	41+00	6.1	56+00	6.0
12+00	3.6	27+00	4.6	42+00	5.7	57+00	5.9
13+00	3.7	28+00	4.9	43+00	6.2	58+00	6.6
14+00	3.8	29+00	4.2	44+00	6.7	59+00	6.3
15+00		30+00		45+00		60+00	

Station Limits		Average Depth (in)	Station Limits		Average Depth (in)	Station Limits		Average Depth (in)	Station Limits		Average Depth (in)
60+00	61+00	6.3	95+00	96+00	9.0	130+00	131+00	6.0	165+00	166+00	5.2
61+00	62+00	7.6	96+00	97+00	9.1	131+00	132+00	6.4	166+00	167+00	5.4
62+00	63+00	7.4	97+00	98+00	9.4	132+00	133+00	6.2	167+00	168+00	5.0
63+00	64+00	7.2	98+00	99+00	9.3	133+00	134+00	6.4	168+00	169+00	5.4
64+00	65+00	7.2	99+00	100+00	8.7	134+00	135+00	6.6	169+00	170+00	5.7
65+00	66+00	7.0	100+00	101+00	8.4	135+00	136+00	6.2	170+00	171+00	5.0
66+00	67+00	6.3	101+00	102+00	8.3	136+00	137+00	6.0	171+00	172+00	4.7
67+00	68+00	6.5	102+00	103+00	8.3	137+00	138+00	6.4	172+00	173+00	5.7
68+00	69+00	7.0	103+00	104+00	7.5	138+00	139+00	7.1	173+00	174+00	5.8
69+00	70+00	6.9	104+00	105+00	7.5	139+00	140+00	7.0	174+00	175+00	5.7
70+00	71+00	7.1	105+00	106+00	8.2	140+00	141+00	7.4	175+00	176+00	5.7
71+00	72+00	6.6	106+00	107+00	9.9	141+00	142+00	8.1	176+00	177+00	5.7
72+00	73+00	6.8	107+00	108+00	9.8	142+00	143+00	7.6	177+00	178+00	5.8
73+00	74+00	6.9	108+00	109+00	9.2	143+00	144+00	7.6	178+00	179+00	6.4
74+00	75+00	7.1	109+00	110+00	9.6	144+00	145+00	6.9	179+00	180+00	5.5
75+00	76+00	6.9	110+00	111+00	9.2	145+00	146+00	7.0	180+00	181+00	5.0
76+00	77+00	7.7	111+00	112+00	9.5	146+00	147+00	6.5	181+00	182+00	5.0
77+00	78+00	7.4	112+00	113+00	7.9	147+00	148+00	6.0	182+00	183+00	5.3
78+00	79+00	7.7	113+00	114+00	6.9	148+00	149+00	6.8	183+00	184+00	5.5
79+00	80+00	7.5	114+00	115+00	6.3	149+00	150+00	6.9	184+00	185+00	5.2
80+00	81+00	7.3	115+00	116+00	6.7	150+00	151+00	6.6	185+00	186+00	5.0
81+00	82+00	6.5	116+00	117+00	7.3	151+00	152+00	6.7	186+00	187+00	5.0
82+00	83+00	7.2	117+00	118+00	7.8	152+00	153+00	7.0	187+00	188+00	6.4
83+00	84+00	6.8	118+00	119+00	7.2	153+00	154+00	6.6	188+00	189+00	7.5
84+00	85+00	6.8	119+00	120+00	6.6	154+00	155+00	6.5	189+00	190+00	6.9
85+00	86+00	7.6	120+00	121+00	7.0	155+00	156+00	6.4	190+00	191+00	6.5
86+00	87+00	7.7	121+00	122+00	7.0	156+00	157+00	7.1	191+00	192+00	7.0
87+00	88+00	7.3	122+00	123+00	6.7	157+00	158+00	7.7	192+00	193+00	8.0
88+00	89+00	7.8	123+00	124+00	5.9	158+00	159+00	7.4	193+00	194+00	7.3
89+00	90+00	8.4	124+00	125+00	6.0	159+00	160+00	7.0	194+00	195+00	7.0
90+00	91+00	8.5	125+00	126+00	6.1	160+00	161+00	7.3	195+00	196+00	6.1
91+00	92+00	8.6	126+00	127+00	6.2	161+00	162+00	7.1	196+00	197+00	6.1
92+00	93+00	8.3	127+00	128+00	5.9	162+00	163+00	6.2	197+00	198+00	5.4
93+00	94+00	8.3	128+00	129+00	6.6	163+00	164+00	5.7	198+00	199+00	5.9
94+00	95+00	8.9	129+00	130+00	6.1	164+00	165+00	5.5	199+00	200+00	5.9

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

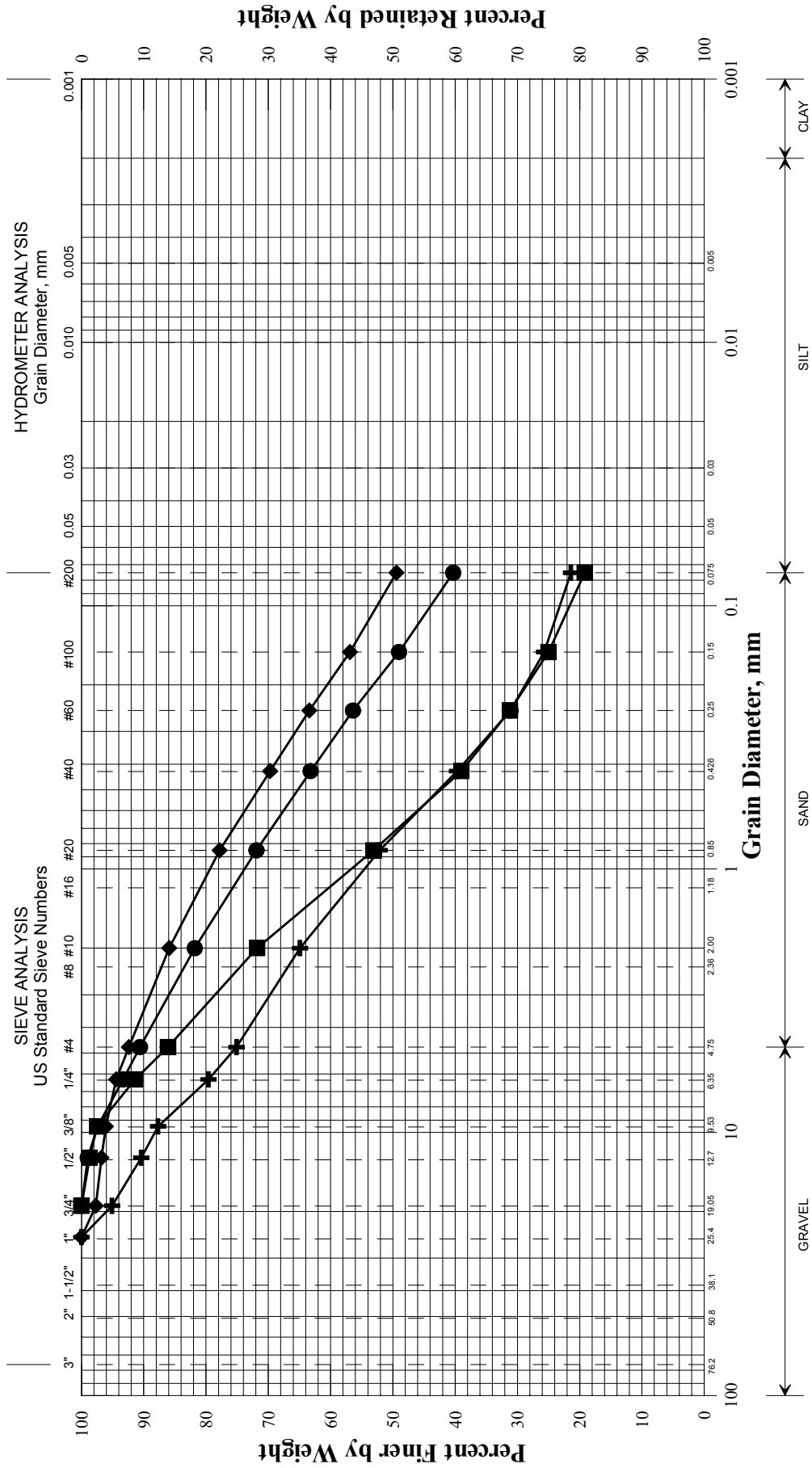


UNIFIED CLASSIFICATION

Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	10+00	9.0 RT	0.46-1.5	SAND, some gravel, little silt.	3.4			
◆	10+00	9.0 RT	1.5-5.0	SILT, some sand, trace gravel.	12.7			
■	40+00	9.0 RT	0.46-1.3	SAND, some silt, little gravel.	4.7			
●	40+00	9.0 RT	1.3-4.5	Silty SAND, trace gravel.	16.5			
▲	40+00	9.0 RT	0.58-1.3	SAND, little silt, trace gravel.	8.3			
×	40+00	9.0 RT	1.3-5.0	SILT, some sand, trace gravel.	19.1			

WIN	019164.00
Town	Rangley, Dallas Pit
Reported by/Date	WHITE, TERRY A 1/6/2012

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



UNIFIED CLASSIFICATION

WIN
019164.00
Town
Rangley, Dallas Pit
Reported by/Date
WHITE, TERRY A 1/6/2012

Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	HB-RADA-107/S7	9.0 RT	0.5-1.2	SAND, some gravel, some silt.	6.7			
◆	HB-RADA-107/S8	9.0 RT	1.2-5.0	Sandy SILT, trace gravel.	0.0			
■	HB-RADA-111/S9	9.0 RT	0.5-2.1	SAND, little silt, little gravel.	4.5			
●	HB-RADA-111/S10	9.0 RT	2.1-5.0	Silty SAND, trace gravel.	18.4			
▲								
×								

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 10+00, 9.0 ft Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _U = Insitu Field Vane Shear Strength (psf) T _V = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _U (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0	S1		0.46 - 1.50					-0.46	5 1/2" PAVEMENT.	-0.46	G#261986 A-1-b, SM WC=3.4% G#261987 A-4, ML WC=12.7%	
	S2		1.50 - 5.00					-1.50	Brown, damp, fine to coarse SAND, some gravel, little silt.	-1.50		
									Light brown, moist, silty, fine to medium SAND, trace gravel.			
5								-5.00	Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	-5.00		
10												
15												
20												
25												

Remarks:
 Offsets are from Existing Roadway CL.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 40+00, 9.0 ft Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S3		0.46 - 1.30			SSA	-0.46	[Graphic Log]	5 1/2" PAVEMENT.	-0.46	G#261988 A-2-4, SM WC=4.7% G#261989 A-4, SM WC=16.5%
	S4		1.30 - 4.50				-1.30		Brown, damp, fine to medium SAND, little gravel, little silt.	-1.30	
									Grey brown, moist, silty, fine to medium SAND.		
5							-4.50		Bottom of Exploration at 4.50 feet below ground surface. NO REFUSAL	-4.50	
10											
15											
20											
25											

Remarks:
 Offsets are from Existing Roadway CL.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: A portion of Route 16 Location: Dallas Plt., Maine	Boring No.: HB-RADA-103 WIN: 19164.00
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Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 40+00, 12.0 ft Lt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Sample Information											Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA	-1.20		Brown, damp, fine to medium SAND, little gravel, little silt. ≈S3			
							-4.00		Grey brown, moist, silty, fine to medium SAND. ≈S4		-1.20	
5						↓	-4.00		Bottom of Exploration at 4.00 feet below ground surface. NO REFUSAL		-4.00	
10												
15												
20												
25												

Remarks:
Offsets are from Existing Roadway CL.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 75+00, 9.0 ft Rt.	Casing ID/OD: N/A	Water Level*: None Observed





Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.50	[Hatched Box]	6" PAVEMENT.	-0.50	
							-1.20	[Hatched Box]	Brown, damp, fine to medium SAND, little gravel, little silt. ≈S3	-1.20	
							-4.50	[Hatched Box]	Grey brown, moist, silty, fine to medium SAND. ≈S4	-4.50	
5									Bottom of Exploration at 4.50 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Existing Roadway CL.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 97+00, 9.0 ft Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S5		0.58 - 1.30			SSA	-0.58		7" PAVEMENT.	-0.58	G#261990 A-1-b, SM WC=8.3% G#261991 A-4, ML WC=19.1%
	S6		1.30 - 5.00				-1.30		Brown, damp, fine to coarse SAND, little gravel, little silt.	-1.30	
									Brown, wet, silty, fine to medium SAND.	-1.30	
5						↓	-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	-5.00	
10											
15											
20											
25											

Remarks:
 Offsets are from Existing Roadway CL.

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: A portion of Route 16 Location: Dallas Plt., Maine	Boring No.: HB-RADA-106 WIN: 19164.00
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Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 97+00, 13.0 ft Rt.	Casing ID/OD: N/A	Water Level*: None Observed





Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows						
0											Brown, damp, fine to coarse SAND, little gravel, little silt. \approx S5	
								-1.00			Grey brown, moist, silty, fine to medium SAND. \approx S4	
								-4.00			Bottom of Exploration at 4.00 feet below ground surface. NO REFUSAL	
5												
10												
15												
20												
25												

Remarks:
Offsets are from Existing Roadway CL.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 125+00, 9.0 ft Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S7		0.50 - 1.20			SSA	-0.50		6" PAVEMENT.		
	S8		1.20 - 5.00				-1.20		Brown, damp, fine to coarse SAND, some gravel, little silt.		
									Olive-brown, wet, silty, fine to medium SAND, little gravel.		
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Existing Roadway CL.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 150+00, 9.0 ft Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.50		6" PAVEMENT.	-0.50	
							-1.60		Brown, damp, fine to coarse SAND, some gravel, little silt. ≈S7	-1.60	
							-5.00		Olive-brown, wet, silty, fine to medium SAND, little gravel. ≈S8	-5.00	
5						↓			Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Existing Roadway CL.

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS	Project: A portion of Route 16 Location: Dallas Plt., Maine	Boring No.: HB-RADA-109 WIN: 19164.00
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Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 150+00, 13.0 ft Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Depth (ft.)	Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log				
0						SSA					Brown, damp, fine to coarse SAND, some gravel, little silt. ≈S7	
								-1.80			Olive-brown, wet, silty, fine to medium SAND, little gravel. ≈S8	
5								-5.00			Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL	
10												
15												
20												
25												

Remarks:
Offsets are from Existing Roadway CL.

Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 175+00, 9.0 ft Rt.	Casing ID/OD: N/A	Water Level*: None Observed





Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _u = Insitu Field Vane Shear Strength (psf) T _v = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _u (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0						SSA	-0.46		5 1/2" PAVEMENT.	-0.46	
							-2.30		Brown, damp, fine to coarse SAND, some gravel, little silt. ≈S7	-2.30	
							-5.00		Olive-brown, wet, silty, fine to medium SAND, little gravel. ≈S8	-5.00	
5						↓			Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Existing Roadway CL.
















Driller: MaineDOT	Elevation (ft.):	Auger ID/OD: 5" Dia.
Operator: Giles/Daggett	Datum: NAVD88	Sampler: Off Flights
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall: N/A
Date Start/Finish: 11/9/11-11/9/11	Drilling Method: Solid Stem Auger	Core Barrel: N/A
Boring Location: 200+00, 9.0 ft Rt.	Casing ID/OD: N/A	Water Level*: None Observed

Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger	Definitions: S _U = Insitu Field Vane Shear Strength (psf) T _V = Pocket Torvane Shear Strength (psf) q _p = Unconfined Compressive Strength (ksf) S _U (lab) = Lab Vane Shear Strength (psf) WOH = weight of 140lb. hammer WOR = weight of rods. WOC = weight of casing	Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test
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Sample Information										Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows ((6 in.) Shear Strength (psf) or RQD (%))	N-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	S9		0.50 - 2.10			SSA	-0.50		6" PAVEMENT.		
									Brown, damp, fine to coarse SAND, little gravel, little silt.	G#261994 A-1-b, SM WC=4.5%	
	S10		2.10 - 5.00				-2.10		Brown, wet, fine to medium SAND, some silt.	G#261995 A-4, SM WC=18.4%	
5							-5.00		Bottom of Exploration at 5.00 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											

Remarks:
 Offsets are from Existing Roadway CL.

MAP LEGEND

Area of Interest (AOI)	Water Features
 Area of Interest (AOI)	 Streams and Canals
Soils	Transportation
 Soil Map Units	 Rails
Soil Ratings	 Interstate Highways
 coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from mica schist	 US Routes
 coarse-loamy lodgment till derived from mica schist and/or coarse-loamy lodgment till derived from gneiss	 Major Roads
 coarse-loamy lodgment till derived from quartzite	
 coarse-loamy lodgment till derived from slate	
 coarse-silty alluvium derived from slate	
 Sandy-Skeletal supraglacial meltout till derived from granite and gneiss	
 Not rated or not available	
Political Features	
 Cities	

MAP INFORMATION

Map Scale: 1:34,800 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000. Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County Area and Part of Somerset County, Maine
 Survey Area Data: Version 14, Sep 23, 2009

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Parent Material Name

Parent Material Name— Summary by Map Unit — Franklin County Area and Part of Somerset County, Maine (ME610)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BTB	Brayton-Peacham-Markey association, gently sloping, very stony	coarse-loamy lodgment till derived from mica schist and/or coarse-loamy lodgment till derived from gneiss	8.3	2.1%
CG	Charles-Medomak-Cornish association	coarse-silty alluvium derived from slate	7.9	2.0%
ChB	Chesuncook silt loam, 3 to 8 percent slopes	coarse-loamy lodgment till derived from slate	54.8	13.6%
HeD	Hermon fine sandy loam, 15 to 25 percent slopes, very stony	Sandy-Skeletal supraglacial meltout till derived from granite and gneiss	8.1	2.0%
MGD	Marlow-Dixfield association, moderately steep, very stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from mica schist	4.8	1.2%
MrB	Monarda silt loam, 0 to 8 percent slopes	coarse-loamy lodgment till derived from quartzite	9.7	2.4%
MsB	Monarda extremely flaggy silt loam, 0 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from quartzite	126.2	31.3%
MTB	Monarda-Burnham-Bucksport association, gently sloping, very stony	coarse-loamy lodgment till derived from quartzite	3.8	0.9%
MUB	Monarda-Telos association, gently sloping, very stony	coarse-loamy lodgment till derived from quartzite	1.5	0.4%
Ps	Pits, sand and gravel		3.4	0.8%
TeB	Telos silt loam, 3 to 8 percent slopes	coarse-loamy lodgment till derived from slate	0.8	0.2%
TfB	Telos silt loam, 3 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from slate	167.0	41.4%
THC	Telos-Chesuncook association, strongly sloping, very stony	coarse-loamy lodgment till derived from slate	0.0	0.0%
Ud	Udorthents-Urban land complex		7.3	1.8%
Totals for Area of Interest			403.7	100.0%

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

MAP LEGEND

Area of Interest (AOI)	Transportation
Area of Interest (AOI)	Rails
Soils	Interstate Highways
Soil Map Units	US Routes
Soil Ratings	Major Roads
A-1	
A-1-a	
A-1-b	
A-2	
A-2-4	
A-2-5	
A-2-6	
A-2-7	
A-3	
A-4	
A-5	
A-6	
A-7	
A-7-5	
A-7-6	
A-8	
Not rated or not available	
Political Features	
Cities	
Water Features	
Streams and Canals	

MAP INFORMATION

Map Scale: 1:34,800 if printed on A size (8.5" x 11") sheet.
 The soil surveys that comprise your AOI were mapped at 1:20,000.
 Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County Area and Part of Somerset County, Maine
 Survey Area Data: Version 14, Sep 23, 2009

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

AASHTO Group Classification (Surface)

AASHTO Group Classification (Surface)— Summary by Map Unit — Franklin County Area and Part of Somerset County, Maine (ME610)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BTB	Brayton-Peacham-Markey association, gently sloping, very stony	A-8	8.3	2.1%
CG	Charles-Medomak-Cornish association	A-4	7.9	2.0%
ChB	Chesuncook silt loam, 3 to 8 percent slopes	A-4	54.8	13.6%
HeD	Hermon fine sandy loam, 15 to 25 percent slopes, very stony		8.1	2.0%
MGD	Marlow-Dixfield association, moderately steep, very stony		4.8	1.2%
MrB	Monarda silt loam, 0 to 8 percent slopes	A-4	9.7	2.4%
MsB	Monarda extremely flaggy silt loam, 0 to 8 percent slopes, very stony		126.2	31.3%
MTB	Monarda-Burnham-Bucksport association, gently sloping, very stony	A-8	3.8	0.9%
MUB	Monarda-Telos association, gently sloping, very stony		1.5	0.4%
Ps	Pits, sand and gravel	A-1	3.4	0.8%
TeB	Telos silt loam, 3 to 8 percent slopes	A-4	0.8	0.2%
TfB	Telos silt loam, 3 to 8 percent slopes, very stony		167.0	41.4%
THC	Telos-Chesuncook association, strongly sloping, very stony		0.0	0.0%
Ud	Udorthents-Urban land complex	A-4	7.3	1.8%
Totals for Area of Interest			403.7	100.0%

Rating Options

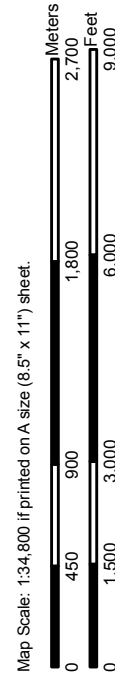
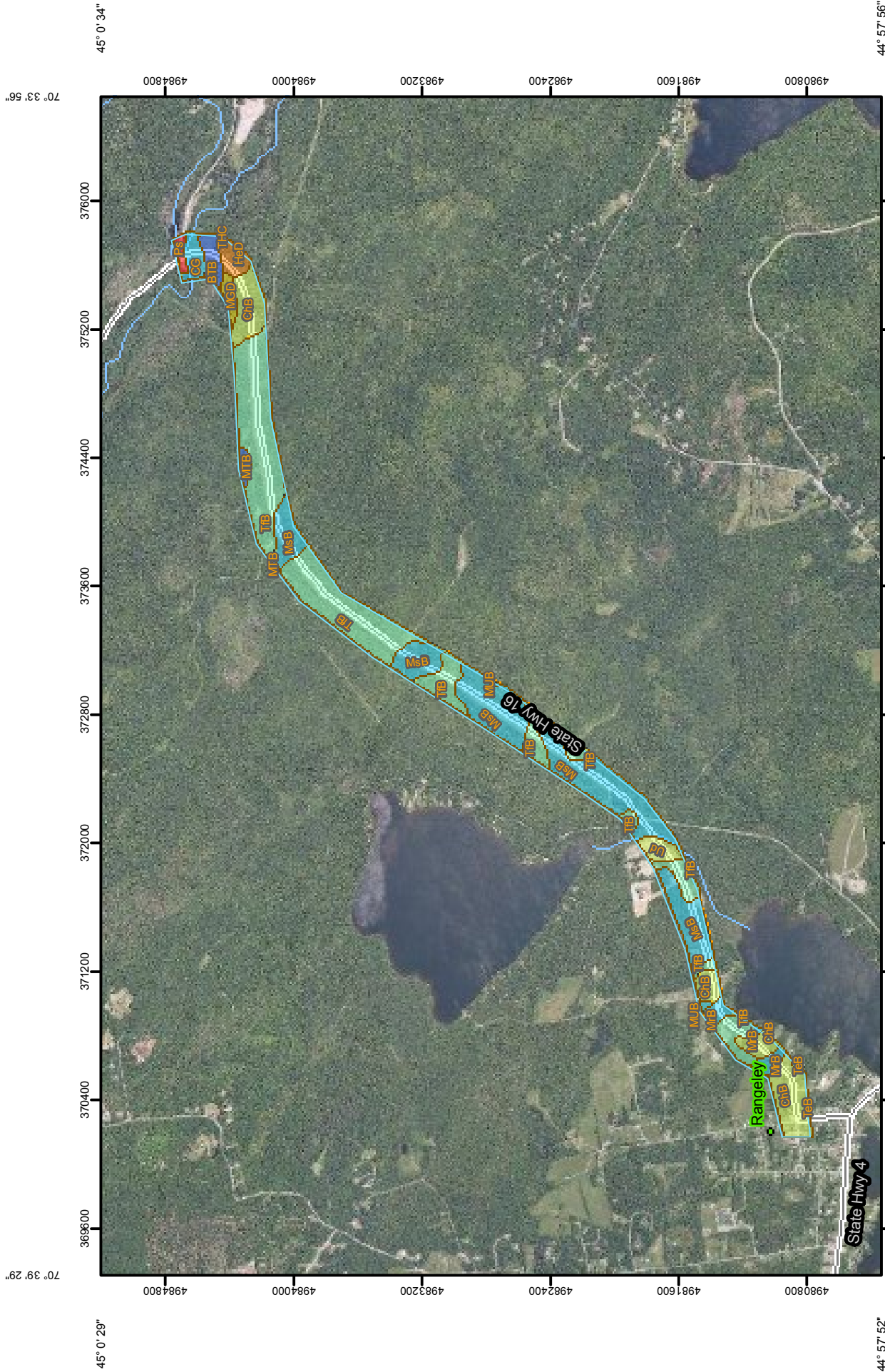
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower


















Layer Options: Surface Layer

Drainage Class—Franklin County Area and Part of Somerset County, Maine
 (19164.00 Rangeley-Dallas Plantation)



Map Scale: 1:34,800 if printed on A size (8.5" x 11") sheet.

MAP LEGEND

Area of Interest (AOI)		Area of Interest (AOI)
Soils		Soil Map Units
Soil Ratings		Excessively drained
		Somewhat excessively drained
		Well drained
		Moderately well drained
		Somewhat poorly drained
		Poorly drained
		Very poorly drained
		Subaqueous
		Not rated or not available
Political Features		Cities
Water Features		Streams and Canals
Transportation		Rails
		Interstate Highways
		US Routes
		Major Roads

MAP INFORMATION

Map Scale: 1:34,800 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000. Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County Area and Part of Somerset County, Maine
 Survey Area Data: Version 14, Sep 23, 2009

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Drainage Class

Drainage Class— Summary by Map Unit — Franklin County Area and Part of Somerset County, Maine (ME610)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BTB	Brayton-Peacham-Markey association, gently sloping, very stony	Very poorly drained	8.3	2.1%
CG	Charles-Medomak-Cornish association	Poorly drained	7.9	2.0%
ChB	Chesuncook silt loam, 3 to 8 percent slopes	Moderately well drained	54.8	13.6%
HeD	Hermon fine sandy loam, 15 to 25 percent slopes, very stony	Somewhat excessively drained	8.1	2.0%
MGD	Marlow-Dixfield association, moderately steep, very stony	Well drained	4.8	1.2%
MrB	Monarda silt loam, 0 to 8 percent slopes	Poorly drained	9.7	2.4%
MsB	Monarda extremely flaggy silt loam, 0 to 8 percent slopes, very stony	Poorly drained	126.2	31.3%
MTB	Monarda-Burnham-Bucksport association, gently sloping, very stony	Very poorly drained	3.8	0.9%
MUB	Monarda-Telos association, gently sloping, very stony	Poorly drained	1.5	0.4%
Ps	Pits, sand and gravel	Excessively drained	3.4	0.8%
TeB	Telos silt loam, 3 to 8 percent slopes	Somewhat poorly drained	0.8	0.2%
TfB	Telos silt loam, 3 to 8 percent slopes, very stony	Somewhat poorly drained	167.0	41.4%
THC	Telos-Chesuncook association, strongly sloping, very stony	Somewhat poorly drained	0.0	0.0%
Ud	Udorthents-Urban land complex	Moderately well drained	7.3	1.8%
Totals for Area of Interest			403.7	100.0%

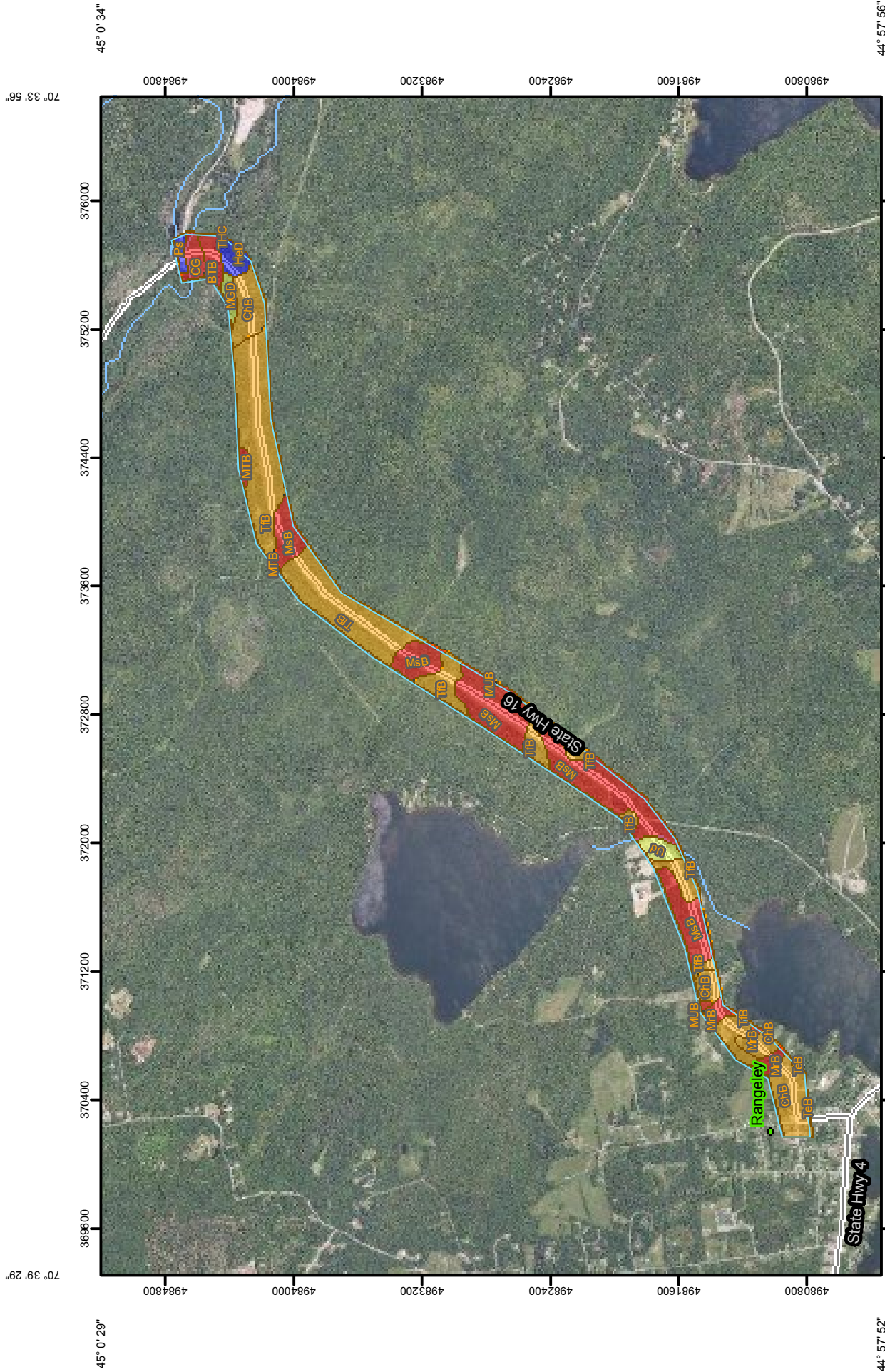
Rating Options

Aggregation Method: Dominant Condition

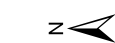
Component Percent Cutoff: None Specified

Tie-break Rule: Higher















Depth to Water Table—Franklin County Area and Part of Somerset County, Maine
 (19164.00 Rangeley-Dallas Plantation)



Map Scale: 1:34,800 if printed on A size (8.5" x 11") sheet.



MAP LEGEND

Area of Interest (AOI)		Area of Interest (AOI)
Soils		Soil Map Units
Soil Ratings		0 - 25
		25 - 50
		50 - 100
		100 - 150
		150 - 200
		> 200
Political Features		Cities
Water Features		Streams and Canals
Transportation		Rails
		Interstate Highways
		US Routes
		Major Roads

MAP INFORMATION

Map Scale: 1:34,800 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000. Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Franklin County Area and Part of Somerset County, Maine
Survey Area Data: Version 14, Sep 23, 2009

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Depth to Water Table

Depth to Water Table— Summary by Map Unit — Franklin County Area and Part of Somerset County, Maine (ME610)				
Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
BTB	Brayton-Peacham-Markey association, gently sloping, very stony	15	8.3	2.1%
CG	Charles-Medomak-Cornish association	15	7.9	2.0%
ChB	Chesuncook silt loam, 3 to 8 percent slopes	46	54.8	13.6%
HeD	Hermon fine sandy loam, 15 to 25 percent slopes, very stony	>200	8.1	2.0%
MGD	Marlow-Dixfield association, moderately steep, very stony	54	4.8	1.2%
MrB	Monarda silt loam, 0 to 8 percent slopes	5	9.7	2.4%
MsB	Monarda extremely flaggy silt loam, 0 to 8 percent slopes, very stony	5	126.2	31.3%
MTB	Monarda-Burnham-Bucksport association, gently sloping, very stony	5	3.8	0.9%
MUB	Monarda-Telos association, gently sloping, very stony	5	1.5	0.4%
Ps	Pits, sand and gravel	>200	3.4	0.8%
TeB	Telos silt loam, 3 to 8 percent slopes	31	0.8	0.2%
TfB	Telos silt loam, 3 to 8 percent slopes, very stony	31	167.0	41.4%
THC	Telos-Chesuncook association, strongly sloping, very stony	31	0.0	0.0%
Ud	Udorthents-Urban land complex	84	7.3	1.8%
Totals for Area of Interest			403.7	100.0%

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

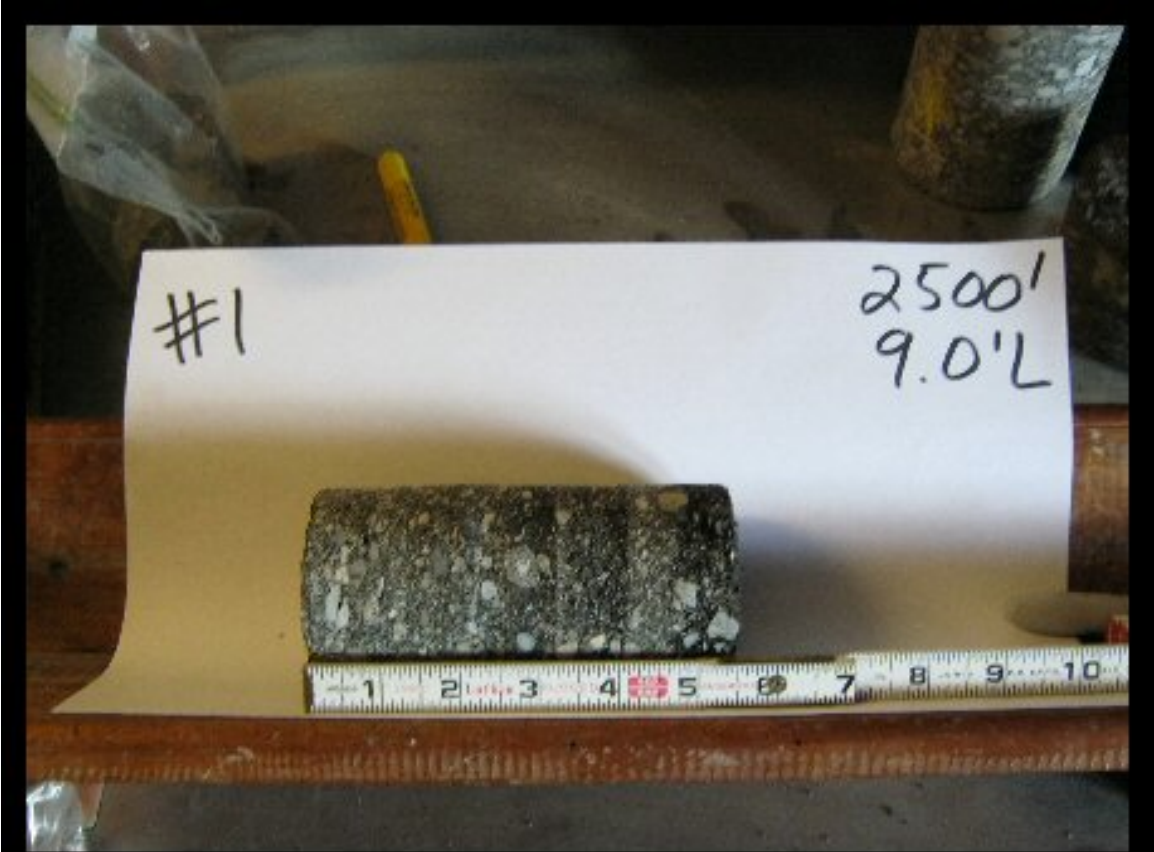
Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

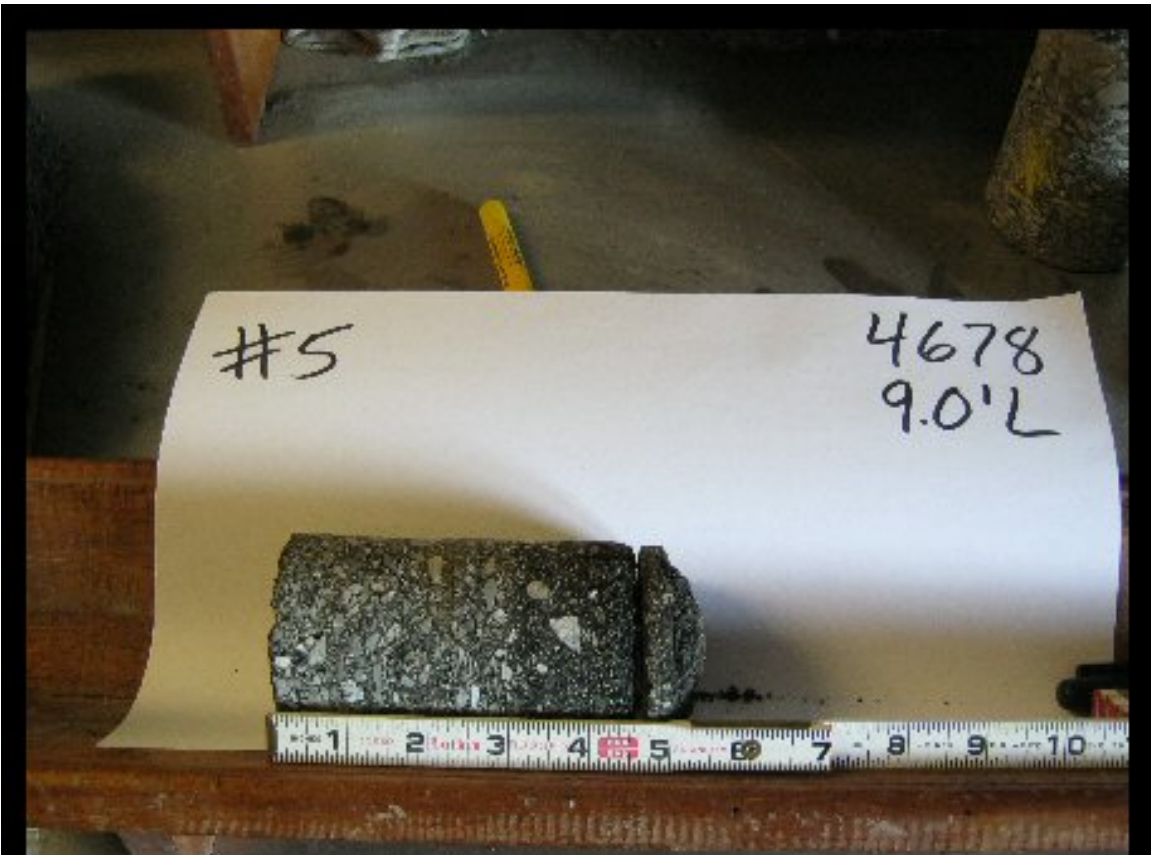
19164.00
Dallas Plantation – Rangeley
Pavement Core Photos



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Dallas Plantation – Rangeley
Pavement Core Photos



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Pavement Core Photos



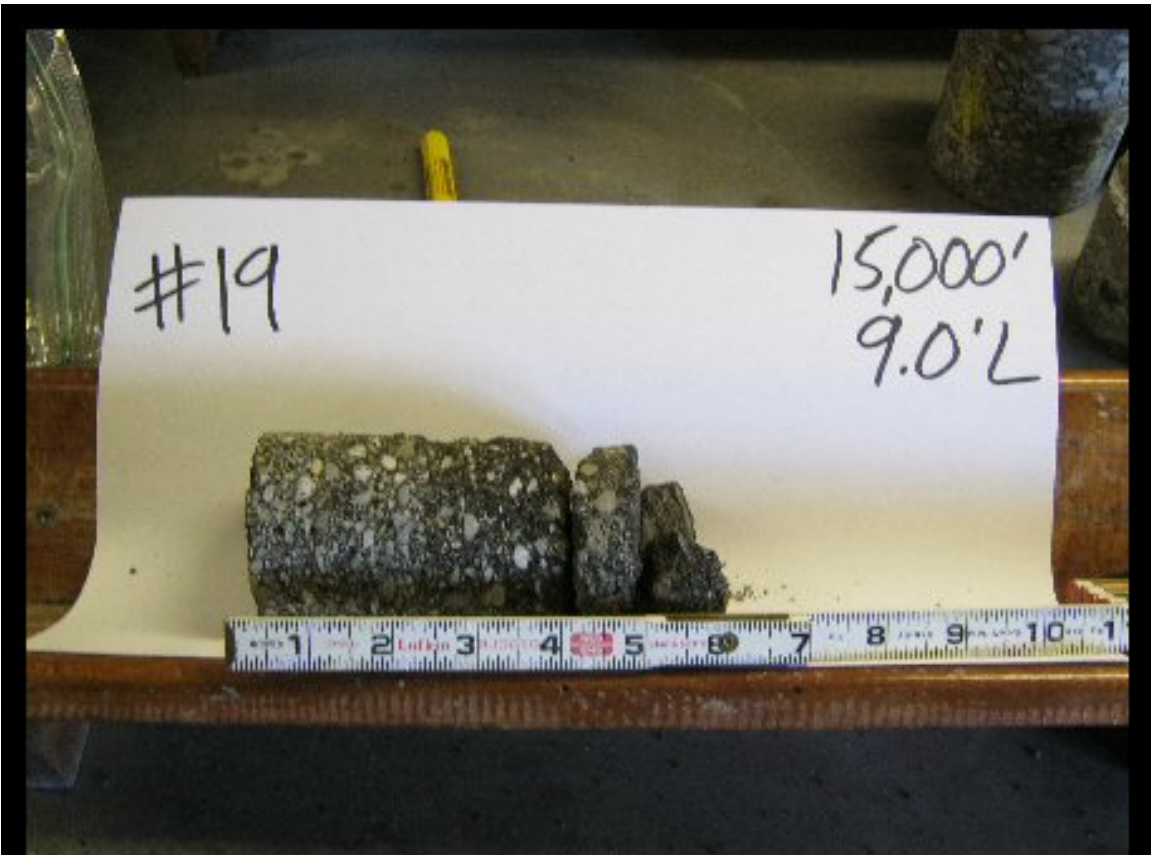
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Dallas Plantation – Rangeley
Pavement Core Photos



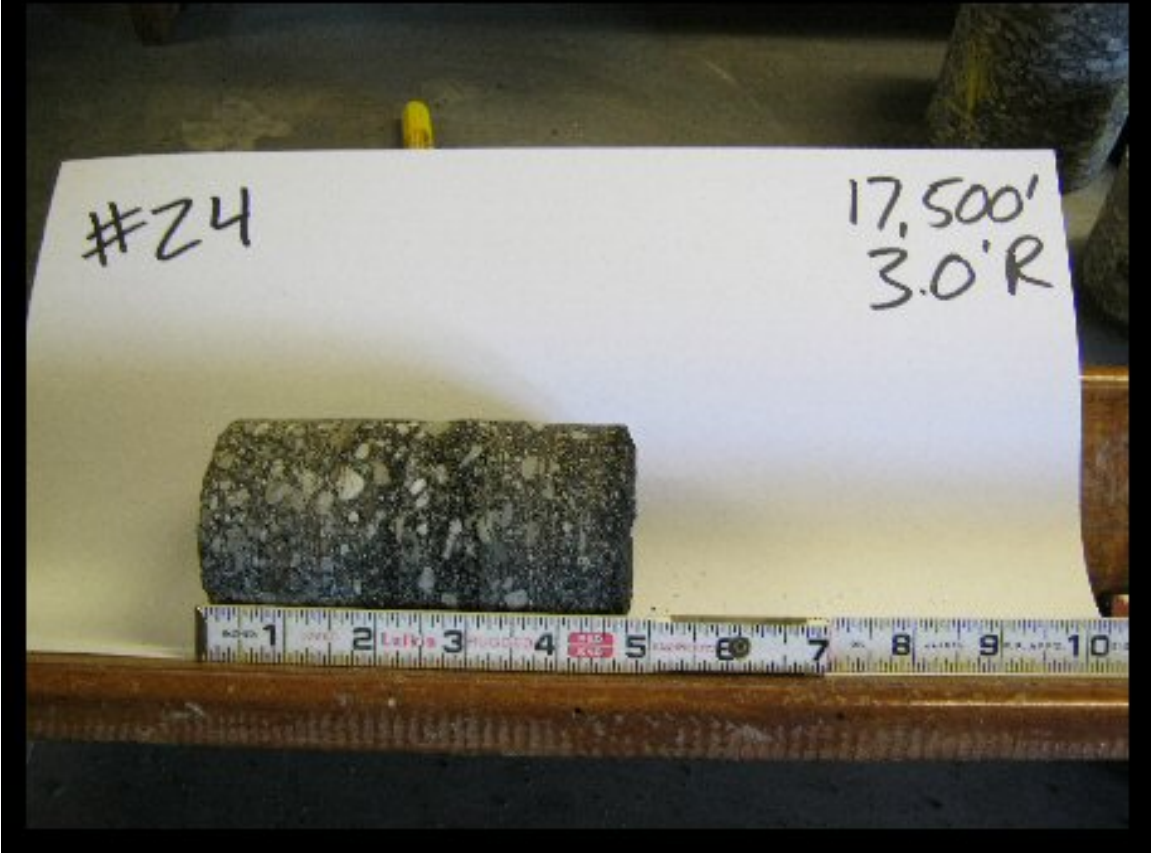
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