Introduction

This supplemental information document is provided to augment information found in the attached Engineering Form 4335, a permit application by the Alaska Department of Transportation and Public Facilities (ADOT&PF) to upgrade and extend a northwest-southeast access corridor from the existing Tofty Road, from northwest of Manley Hot Springs to the Yukon River, Alaska.

Information presented below is organized by the numbered block on the permit application for those blocks where insufficient room was available to answer the question. Sheets 1-110, which follow, are also an integral part of the application.

Application Block 15: Location of Project

Latitude and longitude in North American Datum 1983 (NAD83) for major facilities associated with the Road to Tanana Project (hereafter, Project) is presented in Table 15.1. Sheet 1 shows the general vicinity of the Project. Sheet 2 shows the Project Layout including the proposed alignment of the roads, material pads, turnouts, bridges, and parking facilities that will be constructed.

To facilitate review of the road and facilities, the plan view maps move sequentially along the alignment. Sheets 2A and 2B show the plan view sheet numbers that correspond to specific sections of the alignment and related facilities. To access a particular sheet along the alignment, the sheet labels on Sheet 2A and 2B are also hyperlinked to their respective plan view maps.

TABLE 15.1 Project Features by Latitude and Longitude, Decimal Degrees (DD)

Mile Post	Facility Type	Drawing Type(s)	Stream Type	Station Feet (Begin/End)	Latitude	Longitude	Sheet number
15.05	Begin – Existing Road Drainage Improvements	Road Typical A-A		79500 to 85500	65.089142	-150.825793	3,4,5
15.59	Sullivan Creek Crossing	Culvert Typical B-B	Non-Fish	82318.0	65.090761	-150.893828	4
16.09	Tofty Gulch Crossing	Culvert Typical B-B	Non-Fish	84950.0	65.085757	-150.902994	5
16.10	Tofty Gulch Material Site	Cross Sections C-C, D-D, E-E (Typical Fuel)		84997.1	65.085716	-150.903310	5
16.19	Construct New Road Over Existing Trail	Road Typical F-F		85500 to 92000	65.085126	-150.906235	5,6,7,8
17.42	Construct New Road Over Existing Trail	Road Typical G-G		92000 to 93500	65.097726	-150.933808	8
17.71	Construct New Road Over Existing Trail	Road Typical F-F		93500 to 98000	65.100407	-150.941169	8,9,10
18.56	Construct New Road Over Existing Trail	Road Typical G-G		98000 to 99300	65.101275	-150.969199	10
18.81	Construct New Road Over Existing Trail	Road Typical F-F		99300 to 101600	65.102120	-150.977387	10,11

Mile Post	Facility Type	Drawing Type(s)	Stream Type	Station Feet (Begin/End)	Latitude	Longitude	sheet numbers
19.24	Construct New Road Over Existing Trail	Road Typical G-G		101600 to 102500	65.107288	-150.985420	11, 12
19.41	Construct New Road Over Existing Trail	Road Typical F-F		102500 to 107000	65.109592	-150.987461	12, 13
19.83	Ridge Top Material Site	Cross Sections H-H, I-I, J-J (Typical Access) & E-E (Typical Fuel)		104712.5	65.113981	-150.995626	12
20.27	Construct New Road Over Existing Trail	Road Typical G-G		107000 to 108000	65.119492	-151.001796	13, 14
20.45	Construct New Road Over Existing Trail	Road Typical F-F		108000 to 111400	65.120820	-151.007466	14, 15, 16
21.10	Turnout #1	Typical K-K		111400 to 112100	65.128278	-151.019663	15
21.23	Construct New Road Over Existing Trail	Road Typical F-F		112100 to 114000	65.130066	-151.021181	15, 16
21.59	Construct New Road Over Existing Trail	Road Typical G-G		114000 to 115700	65.131251	-151.032705	16
21.91	Construct New Road Over Existing Trail	Road Typical F-F		115700 to 116200	65.131366	-151.043408	16, 17
22.01	Turnout #2	Typical K-K		116200 to 116900	65.131533	-151.046598	17
22.14	Construct New Road Over Existing Trail	Road Typical F-F		116900 to 119200	65.131087	-151.051018	17, 18
22.58	Construct New Road Over Existing Trail	Road Typical G-G		119200 to 120600	65.129996	-151.065694	18
22.84	Construct New Road Over Existing Trail	Road Typical F-F		120600 to 125800	65.129574	-151.074729	18, 19, 20
23.83	Construct New Road Over Existing Trail	Road Typical G-G		125800 to 127400	65.126058	-151.106778	20
24.13	Turnout #3	Typical K-K		127400 to 128100	65.123831	-151.115718	20
24.26	Construct New Road Over Existing Trail	Road Typical F-F		128100 to 141500	65.122857	-151.119629	20-25
25.29	American Creek Crossing	Culvert Typical B-B	Non-Fish	133540.0	65.124708	-151.151560	22
26.80	Turnout #4	Typical K-K		141500 to 142200	65.122359	-151.201136	25
26.93	Construct New Road Over Existing Trail	Road Typical F-F		142200 to 150800	65.121168	-151.204692	25-27
28.56	Construct New Road Over Existing Trail	Road Typical G-G		150800 to 151000	65.121514	-151.254398	27, 28
28.60	Construct New Road	Road Typical F-F		151000 to	65.121835	-151.255449	28, 29

Mile Post	Facility Type	Drawing Type(s)	Stream Type	Station Feet (Begin/End)	Latitude	Longitude	Sheet numbers
	Over Existing Trail			156400			28,29
29.62	Construct New Road Over Existing Trail	Road Typical G-G		156400 to 156650	65.131899	-151.275843	29
29.67	Boulder Creek Bridge	Bridge Sheet 85	Fish	156650 to 156755	65.132333	-151.277093	29
29.69	Construct New Road Over Existing Trail	Road Typical G-G		156755 to 157200	65.132506	-151.277637	29,30
29.77	Construct New Road Over Existing Trail	Road Typical F-F		157200 to 159000	65.133371	-151.279624	30
30.11	New Road Bed	New Road Typical N-N		159000 to 166800	65.133371	-151.279624	30 - 34
30.16	Boulder Creek Material Site	Cross Sections L-L, M-M, J-J (Typical Access) & E-E (Typical Fuel)		159230.1	65.137655	-151.286127	30
31.46	Turnout #5	Typical K-K		166100 to 166800	65.143679	-151.324176	34
31.59	New Road Bed	New Road Typical Q-Q		166800 to 173900	65.143744	-151.328720	34, - 37
31.85	Bailey Creek Ridge Material Site	Cross Sections O-O, P-P, J-J (Typical Access) & E-E (Typical Fuel)		168162.4	65.143870	-151.337566	34
32.94	New Road Bed	New Road Typical Q-Q		173900 to 174300	65.137124	-151.368277	37,38
33.30	Bailey Creek Crossing	Culvert Typical R-R	Fish Passage	175810.0	65.138752	-151.378494	38
33.65	Bailey Creek Tributary Crossing	Culvert Typical B-B	Non-Fish	177660.0	65.140639	-151.389454	39
34.41	Turnout #6	Typical K-K		181700 to 182400	65.140889	-151.415756	40
34.55	New Road Bed	New Road Typical N-N		182400 to 185400	65.141167	-151.420248	40,41
34.65	East Long Lake Tributary Crossing	Culvert Typical B-B	Non-Fish	182976.0	65.141283	-151.424002	40
35.11	Turnout #7	Typical K-K		185400 to 186100	65.140587	-151.439480	41
35.25	New Road Bed	New Road Typical Q-Q		186100 to 187000	65.140885	-151.443971	41,42
36.34	Bare Rock Material Site	Cross Sections S-S, T-T, J-J (Typical Access) & E-E (Typical Fuel)		191869.0	65.143853	-151.480279	43

Mile Post	Facility Type	Drawing Type(s)	Stream Type	Station Feet (Begin/End)	Latitude	Longitude	Sheet numbers
36.56	Middle Long Lake Tributary Crossing	Culvert Typical B-B	Non-Fish	193055.0	65.144876	-151.487536	44
39.03	West Long Lake Tributary Crossing	Culvert Typical R-R	Fish Passage	206095.0	65.157476	-151.565764	48
44.34	New Road Bed	New Road Typical Q-Q		234100 to 234500	65.169968	-151.734680	57
44.41	New Road Bed	New Road Typical N-N		234500 to 252300	65.170076	-151.737268	57-64
47.36	Unnamed Creek Crossing #1	Culvert Typical B-B	Non-Fish	250080.0	65.170020	-151.828486	63
47.79	New Road Bed	New Road Typical Q-Q		252350 to 252600	65.176129	-151.829388	64
47.82	Unnamed Creek Crossing #2	Culvert Typical B-B	Non-Fish	252485.0	65.176517	-151.829448	64
47.84	New Road Bed	New Road Typical N-N		252600 to 253600	65.176810	-151.829251	64
48.03	New Road Bed	New Road Typical Q-Q		253600 to 253900	65.179499	-151.828293	64
48.05	Yukon Bluffs Material Site	Cross Sections U-U, V-V, J-J (Typical Access) & E-E (Typical Fuel)		253721.5	65.179793	-151.827925	64,66
48.09	New Road Bed	New Road Typical N-N		253900 to 257900	65.180198	-151.827279	66,67
48.70	Twelve-mile Lake Creek Crossing	Culvert Typical R-R	Fish Passage	257110.0	65.187082	-151.831245	67
48.85	New Road Bed	New Road Typical Q-Q		257950 to 258050	65.188597	-151.835310	67
48.87	New Road Bed	New Road Typical N-N		258050 to 259000	65.188836	-151.835627	67
48.92	Yukon River Material Site	Cross Sections W-W, X-X, J-J (Typical Access) & E-E (Typical Fuel)		258294.3	65.189406	-151.836137	67
49.05	New Road Bed	New Road Typical Q-Q		259000 to 259500	65.191363	-151.835173	67
49.15	New Road Bed	New Road Typical N-N		259500 to 260460	65.192698	-151.834541	67,68
49.32	Parking Area	Typical Y-Y		260460 to 260890	65.195665	-151.838842	68
49.41	New Road Bed	New Road Typical N-N		260890 to 260990	65.195665	-151.838842	68

Mile Post	Facility Type	Drawing Type(s)	Stream Type	Station Feet (Begin/End)	Latitude	Longitude	Sheet number
49.42	End of Project to Yukon River Access	New Road Typical Z-Z		260990 to 261121	65.195665	-151.838842	68

Application Block 16: Other Location Descriptions, if Known

The project area is located on the U.S. Geological Survey (USGS) quadrangle maps:

- Tanana 1:250,000
- Tanana 1:63,360 A-2, A-3, A-4

Starting at the junction of the Elliott Highway, the road is located within Section 16, 9, 4, and 3,Township 2 North, Range 15 West; it then crosses into Sections 34, 33, 28, 21, 20, 18, and 19, Township 3 North, Range 15 West; it then crosses into Sections 13, 14, 15, 16, 17, 8, and 18, Township 3 North, Range 16 West; it then crosses into sections 13, 12, 11, 10, 3, and 4, Township 3 North, Range 17 West; it then crosses into section 33, 32, and 31, Township 4 North, Range 17 West; it then crosses into Section 36, Township 4 North, Range 18 West; it then crosses into Sections 1 and 2, Township 3 North, Range 18 West; it then crosses into Sections 35 and 34, Township 4 North, Range 18 West; it then crosses into Sections 3, 4, and 5, Township 3 North, Range 18 West; it then crosses into Sections 32, 31, and 30, Township 4 North, Range 18 West; it then crosses into Sections 25, 26, 35, 27, 28, 29, and 30 Township 4 North, Range 19 West; it then crosses into Sections 25, 24, 23, 22, 21, 20, 17, and 18, Township 4 North, Range 20 West; it then crosses into Sections 13, 14, 15, 22, 21, 16, 9, and 4. Township 4 North, Range 21 West.

TABLE 16.1 Road to Tanana Project Major Facility Locations (Fairbanks Meridian – Township, Range, and Sections)

Facility	Township	Range	Sections
Existing and New Road Construction	2N	15W	3, 4, 9, 16
	3N	15W	18, 19, 20, 21, 28, 33, 34
	3N	16W	8, 13, 14, 15, 16, 17, 18
	3N	17W	3, 4, 10, 11, 12, 13
	4N	17W	31, 32, 33
	4N	18W	36
	3N	18W	1, 2
	4N	18W	34, 35
	3N	18W	3, 4, 5
	4N	18W	30, 31, 32
	4N	19W	25, 26, 27, 28, 29, 30, 35
	4N	20W	16, 17, 18, 20, 21, 22, 23, 24, 25
	4N	21W	4, 9, 13, 14, 15, 16, 21, 22
Tofty Gulch Material Site	3N	17W	13
	3N	16W	18

Facility	Township	Range	Sections
Ridge Top Material Site	3N	17W	3
Boulder Creek Material Site	4N	18W	30, 31
Boulder Creek Bridge	4N	18W	31
Bailey Creek Ridge Material Site	4N	19W	25, 26
Bare Rock Material Site	4N	19W	29, 30
Yukon Bluffs Material Site	4N	21W	9, 10, 15, 16
Yukon River Material Site	4N	21W	9

Application Block 18: Nature of Activity (Description of project, includes all features)

The project consists of:

- Upgrade the last two miles of the existing Tofty Road, as well as an additional 14.5 miles of existing roads and trails that extend past the current terminus of Tofty Road (beginning at approximately mile post 15)
- Install a new bridge at Boulder Creek (#2297)
- Construct 19.34 miles of new road beginning at mile post 29.5
- Expand two existing material sites
- Create five new material sites
- Install 3 new fish passage pipes
- Drainage improvements
- Vegetation clearing
- Construct a public parking area near the road terminus at the Yukon River
- Construct a barge landing approach to OHW limits of the Yukon River.
- Acquire approximately 620 acres for road right-of-way.

Application Block 19: Project Purpose

The ***purpose*** of the Road to Tanana Project is to extend the existing highway system to the Yukon River near Tanana.. The project would improve approximately 16.5 miles of existing road and unimproved trails, and construct 19.34 miles of new road across undeveloped terrain to provide an all-season link to the south bank of the Yukon River.

The following project ***needs*** have been identified:

Extending the highway to the Yukon River would provide the opportunity for residents of Tanana to enjoy more affordable and efficient year-round transportation for passengers, commodities and public safety support. Nearby road access would lower the cost of living in Tanana as well as support economic growth through increased business and employment opportunity for its residents. As Tanana is an historic hub for Yukon and Tanana River barge transportation and commerce, other Yukon River communities may also benefit economically by a reduction of fuel and freight costs to and from Tanana.

Application Block 20: Reason for Discharge

As noted in Application Block 19, there are several purposes and needs an all-season road in this area will support or fulfill. To build an all-season road in this region of Alaska, the deposition of dredged or fill material into waters of the US to construct sections of roadway embankment, turnouts, material sites, equipment staging and maintenance areas and appurtenant crossing structures is unavoidable. Fill material will be placed to construct the roadway embankment, turnouts, and appurtenant structures along the last two miles of the existing Tofty Road to the south bank of the Yukon River, near the village of Tanana (located on the north bank).

Several waterways along the proposed road are tributaries of navigable waters. One, Boulder Creek, will be crossed by a new bridge. Others crossings will use appropriately designed structures to maintain flows. No fill is anticipated in navigable waters of the U.S.

Application Block 21: Types of Material Being Discharged & the Amount of Each Type in Cubic Yards

Sheets 1-110 include site maps, plan views, and cross-sections for all gravel structures, including the roads, turnouts, material sites, and the structural components (bridges and culvert crossings). Estimates of cubic yards of fill are shown in Table 21.1 below. All fill will be native rock (clean) from local sources.

TABLE 21.1 Discharge Amounts by Major Facility

Facility Name	Total Footprint (acres)	Total Footprint in Waters of the US or Wetlands (acres)	Total Cubic Yards of Fill (cyds)	Cubic Yards of Fill in Water of the US or Wetlands (cyds)	Sheet number
Existing Road – Drainage Improvements: Includes: *Sullivan Creek Crossing* *Tofty Gulch Crossing*	18.4	3.0	41,000 *397* *75*	6,500 *88* *17*	4, 5
Existing Road – Drainage Improvements ROW Vegetation Clearing (30' Buffer)	7.2	1.5	Incidental Fallback Only	N/A	N/A
Existing Road – New Road Bed Over Existing Roads/Trails: Includes: *American Creek Crossing*	188.4	4.8	705,000 *48*	38,500 *11*	20-25
Existing Road – New Road Over Existing Roads/Trails ROW Vegetation Clearing (30' Buffer)	101.4	4.2	Incidental Fallback Only	N/A	N/A
New Road Bed/Parking Area:	258.2	13.5	*954,000*	52,500	30-68

Facility Name	Total Footprint (acres)	Total Footprint in Waters of the US or Wetlands (acres)	Total Cubic Yards of Fill (cyds)	Cubic Yards of Fill in Water of the US or Wetlands (cyds)	Sheet numbers
Includes:					
Bailey Creek Crossing			*397*	*121*	38
Bailey Creek Tributary			*48*	*11*	39
East Long Lake Tributary			*48*	*11*	40
Middle Long Lake Trib.			*75*	*17*	44
West Long Lake Tributary			*192*	*50*	48
Unnamed Creek #1			*27*	*6*	63
Unnamed Creek #2			*25*	*5*	64
Twelve-Mile Lake Creek			*108*	*24*	67
New Road Bed/Parking Area Vegetation Clearing (30' Buffer)	141.4	8.2	Incidental Fallback Only	N/A	N/A
Material Sites Combined:	414.5	13.3	See Table 21.2	See Table 21.2	
Includes:					5, 12, 30,
Access Roads	*5.3*	*0.0*			34, 43, 64,
Fuel Storage Areas	*0.2*	*0.0*			66, 67
Mining Areas	*273.8*	*10.6*			
Overburden Storage	*92.1*	*1.6*			
Work Pad	*43.1*	*1.1*			
TOTALS	**1,131.1**	**48.5**	**1,718,864**	**99,895**	
Bridge Over Waters of the U.S. *(Abutments included in road bed estimates above)*	0.2	0.2	See Table 21.2	See Table 21.2	N/A
Retained Vegetative Screens/Buffers within Planned Right-of-Way	231.5	67.7 (Retained, not filled/cleared)	N/A	N/A	N/A
PROJECT TOTAL	**1,131.1**	**48.5**	**1,718,864**	**99,895**	

TABLE 21.2 Discharge by Material Site

Facility Name	Total Footprint (acres)	Total Footprint in Waters of the US or Wetlands (acres)	Total Cubic Yards of Fill (cyds)	Cubic Yards of Fill in Water of the US or Wetlands (cyds)	Sheet numbers
Tofty Gulch Material Site (No Dedicated Access Roads)	34.3	1.8	N/A - Cut	N/A - Cut	5
Ridge Top Material Site	22.8	3.9	N/A – Cut	N/A – Cut	12
North Access Road			*593*	*0*	
South Access Road			*1,244*	*0*	
Boulder Creek Material Site	78.2	6.8	N/A – Cut	N/A – Cut	30

Facility Name	Total Footprint (acres)	Total Footprint in Waters of the US or Wetlands (acres)	Total Cubic Yards of Fill (cyds)	Cubic Yards of Fill in Water of the US or Wetlands (cyds)	Sheet numbers
North Access Road			*3,562*	*0*	30
South Access Road			*620*	*0*	
Boulder Creek Bridge	0.02	0.0 (Elevated Above)			29
Excavated from Floodplain			*639*	*639*	
Fill in Floodplain			*84*	*84*	
Cut Below OHWM			*511*	*511*	
Fill Below OHWM			*11*	*11*	
Rip Rap Below OHWM			*800*	*800*	
Bailey Creek Ridge Material Site	83.5	0.0	N/A – Cut	N/A – Cut	34
East Access Road			*587*	*0*	
West Access Road			*1,719*	*0*	
Bare Rock Material Site	47.4	0.7	N/A – Cut	N/A – Cut	43
East Access Road			*1,813*	*0*	
West Access Road			*695*	*0*	
Yukon Bluffs Material Site	121.5	0.2	N/A – Cut	N/A – Cut	64,66
North Access Road			*616*	*0*	
South Access Road			*1,785*	*0*	
Yukon River Material Site	27.0	0.0	N/A – Cut	N/A – Cut	67
North Access Road			*527*	*0*	
South Access Road			*1,618*	*0*	

Application Block 22: Surface Area in Acres of Wetlands or Other Waters Filled

The Preliminary Jurisdictional Determination, Road to Tanana Project (Three Parameters Plus, Inc. 2012) contains additional maps, data, and descriptions of the wetland and non-wetland natural resources in the project area. Of the area evaluated, approximately 13% were mapped as wetlands or other potentially regulated Waters of the U.S. As shown in Table 21.1, the project footprint in wetlands and other waters of the U.S. is just over 5% of the total project footprint. Sheets 1-109 show the locations and types of fills and structures needed to build the proposed all-season road.

Impacts from the existing road improvements and new road bed are shown in Table 21.1 above with additional detail on material sites and the Boulder Creek Bridge shown in Table 21.2. USACE reviews of material sites require additional information, which is shown in Table 22.1 below. This table shows ADOT&PF's current expectations for site specific impacts at each of the material sites designated on the attached sheets.

TABLE 22.1 Expected Material Site Impacts By Type of Impact

Material Site Name	Miles to/from Manley Hot Springs (Straight Line to Center-point)	Approx. Mile Post Tofty Road	Material Type (Dry is above water table; wet is below water table)	Total Impact Area (acres) [a]	Wetland or Waters of the US Impact Area (acres) [a]	Plan View & Cross Section Sheet Numbers	Reclamation Plan Typical Sheet Number(s)
Tofty Gulch Material Site	9.7	15.91	Dry/Wet; gravel tailings for surfacing	34.3	1.8	Sheet 74 Sheet 75 Sheet 76	Sheet 107 Sheet 108
Ridge Top Material Site	13.1	19.7	Dry; Quarry, Soft Bedrock; embankment material	22.8	3.9	Sheet 80 Sheet 81 Sheet 82 Sheet 83	Sheet 107 Sheet 109 Sheet 110
Boulder Creek Material Site	21.5	29.92	Dry/Wet; gravel tailings for surfacing	78.2	6.8	Sheet 83 Sheet 86 Sheet 87 Sheet 88	Sheet 107 Sheet 108
Bailey Creek Ridge Material Site	22.9	31.82	Dry; Soft Bedrock; embankment material	83.5	0.0	Sheet 83 Sheet 90 Sheet 91 Sheet 92	Sheet 108 Sheet 109
Bare Rock Material Site	26.7	36.17	Dry/Wet; Quarry; embankment material & crushed aggregate for surfacing	47.4	0.7	Sheet 83 Sheet 96 Sheet 97 Sheet 98	Sheet 107 Sheet 108 Sheet 110
Yukon Bluffs Material Site	36.8	47.73	Dry/Wet; embankment material	121.5	0.2	Sheet 83 Sheet 99 Sheet 100 Sheet 101	Sheet 107 Sheet 108
Yukon River Material Site	37.6	48.67	Dry/Wet; Silty Sand and Sandy Silt	27.0	0.0	Sheet 83 Sheet 102 Sheet 103 Sheet 104	Sheet 107 Sheet 108 Sheet 109
TOTALS	**N/A**	**N/A**	**N/A**	**414.5**	**13.3**	**N/A**	**N/A**

Notes: a. Rounding errors may result in subtotal/total discrepancies.

Two of the material sites that will involve wetland/waters impacts have been historically influenced by prior placer mining and related activity. Figure 22.1 shows the general perimeter of the Boulder Creek Material Site in yellow over aerial photography, with the proposed mining/disturbance area highlighted in green. Figure 22.2 shows the Tofty Material Site, which has also been historically disturbed.

Figure 22.1 Boulder Creek Material Site

Figure 22.2 Tofty Material Site

Wetland and waterbody impacts anticipated from the project have been evaluated by wetland scientists using two classification systems. The first, used by the US Fish and Wildlife Service (USFWS) as the classification system of National Wetlands Inventory (NWI) program, is referred to as the Cowardin Classification. Table 22.2 below reflects the maximum anticipated impacts to each of these types by the project as currently proposed.

TABLE 22.2 Maximum Impacts to Wetland and Waters by Cowardin Classification (NWI)

	NWI (Cowardin) Classification	Maximum Wetland Impacts (acres)[a]
Existing Road – Drainage Improvements (Cut/Fill)	PEM1C	-
	PFO1/4A	-
	PF01/SS1A	-
	PFO1/SS1B	-
	PFO1B	-
	PFO4/1B	-
	PFO4/SS1B	-
	PFO4/SS4B	-
	PFO4B	-
	PSS1/4B	-
	PSS1/EM1C	0.0[b]
	PSS1/EM1F	-
	PSS1A	0.3
	PSS1B	0.1
	PSS1C	0.2
	PSS4/1B	0.2
	PSS4/FO4B	-
	PSS4B	0.1
	PUBH	0.0
	PUBHx	1.9
	R2UBH	0.1
	R3UBS	-
	U[c]	-
Existing Road – Drainage Improvements (Vegetation Clearing)	PEM1C	-
	PFO1/4A	-
	PF01/SS1A	-
	PFO1/SS1B	-
	PFO1B	-
	PFO4/1B	-
	PFO4/SS1B	-
	PFO4/SS4B	-
	PFO4B	-
	PSS1/4B	0.2
	PSS1/EM1C	-
	PSS1/EM1F	-
	PSS1A	0.1

	NWI (Cowardin) Classification	Maximum Wetland Impacts (acres)[a]
	PSS1B	0.0
	PSS1C	-
	PSS4/1B	0.9
	PSS4/FO4B	-
	PSS4B	0.3
	PUBH	-
	PUBHx	-
	R2UBH	-
	R3UBS	-
	U[c]	-
Subtotal Existing Road – Drainage Improvements		*4.4*
Existing Road – New Road Bed Over Existing Roads/Trails (Cut/Fill)	PEM1C	-
	PFO1/4A	-
	PF01/SS1A	0.3
	PFO1/SS1B	-
	PFO1B	-
	PFO4/1B	-
	PFO4/SS1B	1.2
	PFO4/SS4B	-
	PFO4B	-
	PSS1/4B	0.7
	PSS1/EM1C	-
	PSS1/EM1F	-
	PSS1A	-
	PSS1B	0.2
	PSS1C	-
	PSS4/1B	0.2
	PSS4/FO4B	-
	PSS4B	2.2
	PUBH	-
	PUBHx	-
	R2UBH	-
	R3UBS	-
	U[c]	-
Existing Road – New Road Bed Over Existing Roads/Trails (Vegetation Clearing)	PEM1C	-
	PFO1/4A	-
	PFO1/SS1A	0.2
	PFO1/SS1B	0.8
	PFO1B	-
	PFO4/1B	-
	PFO4/SS1B	-
	PFO4/SS4B	-

	NWI (Cowardin) Classification	Maximum Wetland Impacts (acres)[a]
	PFO4B	-
	PSS1/4B	0.7
	PSS1/EM1C	0.0
	PSS1/EM1F	-
	PSS1A	-
	PSS1B	0.4
	PSS1C	-
	PSS4/1B	0.5
	PSS4B	1.6
	PUBHx	-
	R2UBH	-
	R3UBH	-
	U[c]	-
Subtotal – New Road Bed Over Existing Roads/Trails		*9.0*
New Road Bed/Parking Area (Cut/Fill)	PEM1C	0.0
	PFO1/4A	0.9
	PF01/SS1A	0.3
	PFO1/SS1B	-
	PFO1B	0.5
	PFO4/1B	0.7
	PFO4/SS1B	0.2
	PFO4/SS4B	1.1
	PFO4B	1.1
	PSS1/4B	0.1
	PSS1/EM1C	-
	PSS1/EM1F	0.1
	PSS1A	-
	PSS1B	0.4
	PSS1C	0.3
	PSS4/1B	2.3
	PSS4/FO4B	0.1
	PSS4B	5.4
	PUBH	-
	PUBHx	-
	R2UBH	-
	R3UBS	-
	U[c]	0.1
New Road Bed/Parking Area (Vegetation Clearing)	PEM1C	0.0
	PFO1/4A	0.4
	PFO1/SS1A	0.1
	PFO1/SS1B	-
	PFO1B	0.3

	NWI (Cowardin) Classification	Maximum Wetland Impacts (acres)[a]
	PFO4/1B	0.5
	PFO4/SS1B	0.2
	PFO4/SS4B	1.1
	PFO4B	0.7
	PSS1/4B	0.2
	PSS1/EM1C	-
	PSS1/EM1F	0.0
	PSS1A	-
	PSS1B	0.2
	PSS1C	0.2
	PSS4/1B	1.3
	PSS4/FO4B	0.1
	PSS4B	2.7
	PUBHx	-
	R2UBH	-
	R3UBH	-
	U[c]	0.0
Subtotal New Road Bed		*21.6*
Material Sites (Cut/Fill – No Vegetation Clearing)	PEM1C	0.3
	PEM1H	-
	PFO1A	0.1
	PFO1C	-
	PFO4B	-
	PFO4/SS1B	1.1
	PSS1/4B	1.8
	PSS1/EM1C	0.0
	PSS4/FO4B	-
	PSS1A	0.3
	PSS1B	1.1
	PSS1C	0.2
	PSS4/1B	1.0
	PSS4B	1.8
	PUBH	0.1
	PUBHb	0.0
	PUBHx	5.4
	PUSCb	-
	PUSCx	0.1
	R3UBH	-
	R3UBHb	-
	Subtotal Material Sites	*13.3*
	TOTAL	**48.5**

Notes: a. Rounding errors may result in subtotal/total discrepancies.

	NWI (Cowardin) Classification	Maximum Wetland Impacts (acres)[a]
b. A value of 0.0 in the table infers impacts less than .01 acres are expected.		
c. Expected to include wetland inclusions.		

The second classification system used by wetland scientists to better understand potential impacts to wetlands and waters on a function by function basis is referred to as the Hydrogeomorphic (HGM) Classification method. This method classifies wetlands according to their primary water (hydrologic) source. Table 22.3 below reflects the anticipated impacts to each HGM class by the project as currently proposed.

TABLE 22.3 Maximum Impacts to Wetlands and Waters By HGM Type

	HGM Classification	Maximum Impact (Acres)
Existing Road – Drainage Improvements (Cut/Fill)	DEPRESSIONAL	1.9
	FLAT	0.4
	RIVERINE	0.6
	RIVERINE CHANNEL	0.1
	SLOPE	0.0
Subtotal Impacts from Cut/Fills		*3.0*
Existing Road – Drainage Improvements (Vegetation Clearing – 30' Buffer)	FLAT	1.4
	RIVERINE	0.1
Subtotal Impacts from Vegetation Clearing		*1.5*
Subtotal Existing Road Drainage Improvements		**4.5**
Existing Road – Construct New Road Bed Over Existing Road/Trails (Cut/Fill)	DEPRESSIONAL	0.1
	FLAT	4.4
	SLOPE	0.3
Subtotal Impacts from Cut/Fills		*4.8*
Existing Road – Construct New Road Bed Over Existing Road/Trails (Vegetation Clearing – 30' Buffer)	FLAT	3.9
	SLOPE	0.3
Subtotal Impacts from Vegetation Clearing		*4.2*
Subtotal Existing Road – Construct New Road Over Existing Road/Trails		**9.0**
New Road Bed & Parking Area Construction (Cut/Fill)	DEPRESSIONAL	0.1
	FLAT	5.0
	RIVERINE	2.3
	SLOPE	6.0
Subtotal Impacts from Cut/Fills		*13.5*
New Road Bed Construction (Vegetation Clearing – 30' Buffer)	DEPRESSIONAL	0.0
	FLAT	3.7
	RIVERINE	1.3

	HGM Classification	Maximum Impact (Acres)
	SLOPE	3.1
Subtotal Impacts from Vegetation Clearing		*8.2*
Subtotal New Road Bed Construction		**21.7**
Material Sites/Access Roads (Cuts, Fills, Cut/Fills – No Vegetation Clearing Impacts)	DEPRESSIONAL	6.1
	FLAT	6.6
	RIVERINE	0.6
Subtotal Material Sites/Access Roads		**13.3**
PROJECT TOTAL		**48.5**

Notes: a. Rounding errors may result in subtotal/total discrepancies.
b. A value of 0.0 in the table infers impacts less than .01 acres are expected.

Wetland impacts by the predominant land cover types are shown in Table 22.4 while more detailed vegetation types are shown in Table 22.5.

TABLE 22.4 Predominant Land Cover Type Impacts (EROS)

Landcover Type	Land Cover Classification	Total (acres)	Waters of the U.S./Wetlands (acres)
Forest Types	Deciduous Forest	350.8	5.9
	Evergreen Forest	294.5	23.8
	Mixed Forest	116.1	3.4
Miscellaneous Types	Barren Land (Rock/Sand/Clay)	1.7	0.2
	Developed, Low Intensity	1.6	0.0
	Open Water	6.2	1.3
Shrub Types	Dwarf Shrub	5.7	0.0
	Shrub/Scrub	322.6	9.9
Wetland Types	Woody Wetlands	32.0	4.0
	Grand Total	**1,131.1**	**48.5**

TABLE 22.5 Predominant Vegetation Type Impacts

	Vegetation Type Classification	Total Impacts (acres)	Wetland Impacts (acres)
Existing Road – Drainage Improvements (Cut/Fill)	Bare Ground	4.8	-
	Bluejoint Tall Grass	0.8	-
	Closed Alder Shrub	0.2	0.2
	Closed Alder Willow Shrub	0.5	0.0
	Closed Black Spruce Forest	-	-
	Closed Deciduous Forest	5.5	-
	Closed Mixed Forest	0.1	-
	Closed White Spruce Forest	-	-
	Closed Willow Shrub	0.4	0.2
	Low Shrub Bog	-	-
	Mesic Herbaceous (Inv)	0.1	-
	Open Alder Shrub	-	-
	Open Alder Willow Shrub	0.9	0.1
	Open Black Spruce Forest	0.4	0.4
	Open Deciduous Forest	0.2	-
	Open Deciduous Forest -Shrub	-	-
	Open Mixed Forest	0.7	-
	Open Mixed Forest - Shrub	-	-
	Open Water	2.0	2.0
	Open Willow Shrub	2.0	0.2
	Open White Spruce Forest	-	-
	Partially Vegetated	-	-
	Spruce Woodland	-	-
	Woodland Deciduous Forest	-	-
	Woodland Mixed Forest	-	-
Subtotal		***18.4***	***3.0***
Existing Road – Drainage Improvements (Vegetation Clearing)	Bare Ground	0.0	-
	Bluejoint Tall Grass	0.2	-
	Closed Alder Shrub	-	-
	Closed Alder Willow Shrub	0.0	-
	Closed Black Spruce Forest	-	-
	Closed Deciduous Forest	3.4	-
	Closed Mixed Forest	0.1	-
	Closed White Spruce Forest	-	-
	Closed Willow Shrub	0.2	0.1
	Low Shrub Bog	-	-

	Vegetation Type Classification	Total Impacts (acres)	Wetland Impacts (acres)
	Mesic Herbaceous (Inv)	-	-
	Open Alder Shrub	-	-
	Open Alder Willow Shrub	0.1	-
	Open Black Spruce Forest	1.2	1.2
	Open Deciduous Forest	0.2	-
	Open Deciduous Forest -Shrub	-	-
	Open Mixed Forest	1.1	-
	Open Mixed Forest - Shrub	0.1	-
	Open Water	-	-
	Open Willow Shrub	0.3	0.0
	Open White Spruce Forest	-	-
	Partially Vegetated	-	-
	Spruce Woodland	0.2	0.2
	Woodland Deciduous Forest	-	-
	Woodland Mixed Forest	0.1	-
Subtotal		***7.2***	***1.5***
Existing Road – New Road Over Existing Roads/Trails (Cut/Fill)	Bare Ground	30.6	-
	Bluejoint Tall Grass	0.1	-
	Closed Alder Shrub	2.8	0.1
	Closed Alder Willow Shrub	1.2	-
	Closed Black Spruce Forest	2.7	2.2
	Closed Deciduous Forest	47.8	-
	Closed Mixed Forest	30.9	-
	Closed White Spruce Forest	0.2	-
	Closed Willow Shrub	-	-
	Low Shrub Bog	-	-
	Mesic Herbaceous (Inv)	1.2	-
	Open Alder Shrub	0.7	-
	Open Alder Willow Shrub	1.1	-
	Open Black Spruce Forest	13.1	1.3
	Open Deciduous Forest	14.7	0.3
	Open Deciduous Forest -Shrub	-	-
	Open Mixed Forest	36.5	-
	Open Mixed Forest - Shrub	0.1	-
	Open Water	-	-
	Open Willow Shrub	0.3	-
	Open White Spruce Forest	0.3	-
	Partially Vegetated	0.3	-

	Vegetation Type Classification	Total Impacts (acres)	Wetland Impacts (acres)
	Spruce Woodland	0.3	0.1
	Woodland Deciduous Forest	0.2	0.1
	Woodland Mixed Forest	3.5	0.7
Subtotal		***188.4***	***4.8***
Existing Road – New Road Over Existing Roads/Trails (Vegetation Clearing)	Bare Ground	1.7	-
	Bluejoint Tall Grass	0.1	-
	Closed Alder Shrub	1.0	-
	Closed Alder Willow Shrub	0.6	-
	Closed Black Spruce Forest	2.1	1.6
	Closed Deciduous Forest	27.8	-
	Closed Mixed Forest	20.4	-
	Closed White Spruce Forest	0.2	-
	Closed Willow Shrub	-	-
	Low Shrub Bog	-	-
	Mesic Herbaceous (Inv)	0.1	-
	Open Alder Shrub	0.0	-
	Open Alder Willow Shrub	0.2	-
	Open Black Spruce Forest	10.0	1.3
	Open Deciduous Forest	10.1	0.2
	Open Deciduous Forest -Shrub	-	-
	Open Mixed Forest	21.7	-
	Open Mixed Forest - Shrub	-	-
	Open Water	-	-
	Open Willow Shrub	0.1	0.0
	Open White Spruce Forest	0.6	-
	Partially Vegetated	0.2	-
	Spruce Woodland	0.3	-
	Woodland Deciduous Forest	0.4	0.4
	Woodland Mixed Forest	4.0	0.7
Subtotal		***101.4***	***4.2***
New Road Bed (Cut/Fill)	Bare Ground	0.0	0.0
	Bluejoint Tall Grass	-	-
	Closed Alder Shrub	-	-
	Closed Alder Willow Shrub	0.4	0.4
	Closed Black Spruce Forest	11.4	5.3
	Closed Deciduous Forest	85.7	-
	Closed Mixed Forest	57.9	-
	Closed White Spruce Forest	4.3	-

	Vegetation Type Classification	Total Impacts (acres)	Wetland Impacts (acres)
	Closed Willow Shrub	-	-
	Low Shrub Bog	0.3	0.3
	Mesic Herbaceous (Inv)	-	-
	Open Alder Shrub	-	-
	Open Alder Willow Shrub	-	-
	Open Black Spruce Forest	14.3	3.9
	Open Deciduous Forest	8.1	0.8
	Open Deciduous Forest -Shrub	1.5	-
	Open Mixed Forest	54.2	2.8
	Open Mixed Forest - Shrub	1.1	-
	Open Water	-	-
	Open Willow Shrub	-	-
	Open White Spruce Forest	11.7	-
	Partially Vegetated	-	-
	Spruce Woodland	1.8	0.1
	Woodland Deciduous Forest	3.4	-
	Woodland Mixed Forest	3.3	-
Subtotal		***259.4***	***13.5***
New Road Bed/Parking Area (Vegetation Clearing)	Bare Ground	-	-
	Bluejoint Tall Grass	0.0	0.0
	Closed Alder Shrub	-	-
	Closed Alder Willow Shrub	0.2	0.2
	Closed Black Spruce Forest	6.1	2.8
	Closed Deciduous Forest	48.5	-
	Closed Mixed Forest	29.3	-
	Closed White Spruce Forest	2.3	-
	Closed Willow Shrub	-	-
	Low Shrub Bog	0.2	0.2
	Low Shrub Tundra	0.0	-
	Mesic Herbaceous (Inv)	-	-
	Open Alder Shrub	-	-
	Open Alder Willow Shrub	-	-
	Open Black Spruce Forest	9.2	2.7
	Open Deciduous Forest	4.6	0.5
	Open Deciduous Forest -Shrub	1.2	-
	Open Mixed Forest	28.5	1.6
	Open Mixed Forest - Shrub	0.7	0.0
	Open Water	-	-

	Vegetation Type Classification	Total Impacts (acres)	Wetland Impacts (acres)
	Open Willow Shrub	-	-
	Open White Spruce Forest	6.3	-
	Partially Vegetated	0.0	-
	Spruce Woodland	1.3	0.2
	Woodland Deciduous Forest	1.9	-
	Woodland Mixed Forest	1.3	0.0
Subtotal		***141.5***	***8.2***
Material Sites (Cut/Fill – No Vegetation Clearing Impacts)	Bare Ground	2.8	-
	Bluejoint Tall Grass	-	-
	Closed Alder Shrub	26.7	0.2
	Closed Alder Willow Shrub	0.8	0.0
	Closed Black Spruce Forest	0.5	-
	Closed Deciduous Forest	116.4	0.1
	Closed Mixed Forest	64.5	-
	Closed White Spruce Forest	4.7	-
	Closed Willow Shrub	0.6	-
	Dwarf Birch Low Shrub	1.6	-
	Low Shrub Bog	0.2	0.2
	Low Shrub Tundra	-	-
	Mesic Herb Invasives	1.1	-
	Open Alder Shrub	1.6	-
	Open Alder Willow Shrub	2.5	0.2
	Open Black Spruce Forest	25.4	3.9
	Open Deciduous Forest	49.3	-
	Open Deciduous Forest - Shrub	4.0	-
	Open Mixed Forest	73.9	-
	Open Mixed Forest - Shrub	0.3	-
	Open Water	5.6	5.6
	Open Willow Shrub	0.2	0.2
	Partially Vegetated	1.0	-
	Spruce Woodland	10.2	1.8
	Wet Herbaceous	0.3	0.3
	Woodland Deciduous Forest	13.4	0.7
	Woodland Mixed Forest	7.0	-
	Subtotal	***414.6***	***13.2***
	TOTAL	**1,131.1**	**48.5**

Notes: a. Rounding errors may result in subtotal/total discrepancies.
b. A value of 0.0 in the table infers impacts less than .01 acres are expected.