APPENDICES

Figures *(9 pages)*

Invasive Plant Survey and Invasive Species Control and Management Plan *(34 pages)*

Consultation and Coordination *(10 pages)*

Supporting Information *(7 pages)*

(Note: The appendices contained herein are not ADA Section 508 compliant. If you need assistance with these documents, please contact the Anchorage Field Office at 907-267-1246.)

FIGURES

File: J:\Jobsdata\73401.00 MLP Plant 2 Expansion\00 CADD\02 Figures\73401.00 – Figure 2.dwg

CRW ENGINEERING GROUP, LLC

PROJECT: 73401.00
STATUS: FINAL

MUNICIPAL LIGHT & POWER
SITE GRADING IMPROVEMENTS

VICINITY MAP

DATE: DEC 2012
SCALE: GRAPHIC
FIGURE: 2

70 0 35 70 140
GRAPHIC SCALE

ML&P

CRW ENGINEERING GROUP, LLC

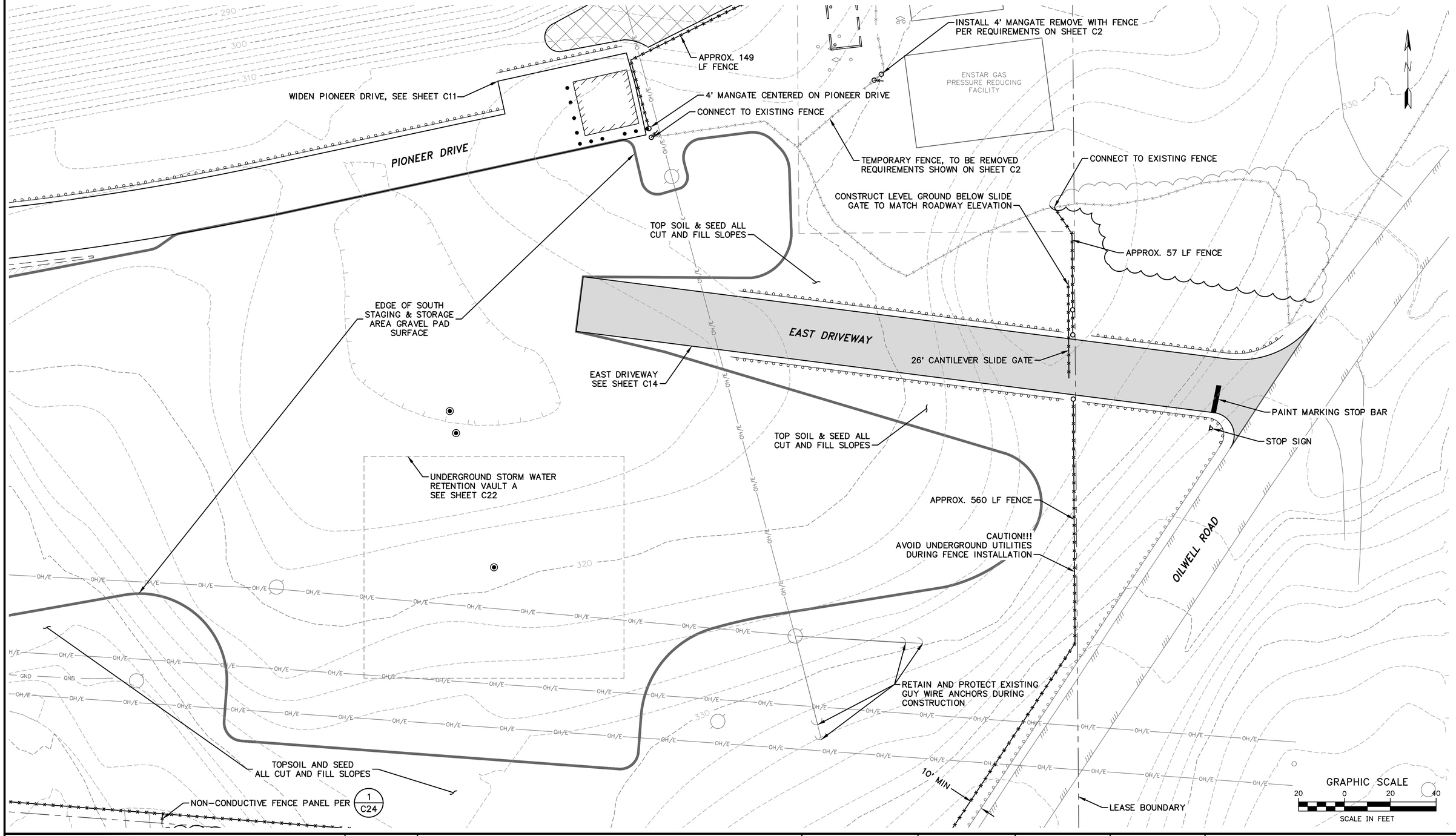
PROJECT: 73401.00
STATUS: DRAFT

MUNICIPAL LIGHT & POWER

FIGURE 2 LOCATION MAP

DATE: APR 2013
SCALE: GRAPHIC
FIGURE: 1

File: J:\Jobsdata\73401.00 MLP Plant 2 Expansion\00 CADD\02 Figures\73401.00 Military Land Exhibit 2.dwg



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VERIFY SCALE THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING. 0" ——— 1" IF BAR IS NOT ONE INCH, ADJUST DRAWING SCALE ACCORDINGLY. FULL SIZE SCALE HORZ SCALE: VERT SCALE:

DATA	DRAWN BY	CHECKED BY	DATA	DRAWN BY	CHECKED BY
BASE			TELEPHONE		
TOPOGRAPHY			ELECTRIC		
PROFILE			CABLE TV		
SANITARY SEWER			TRAFFIC SIGNAL		
STORM SEWER			DESIGN		
WATER			QUANTITIES		
GAS			MUN. FINAL CHECK		

PLAN CHECK

REV	DATE	DESCRIPTION	BY

REVISIONS

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   COMPANY: _____
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   DATA TRANSFER CHECKED BY: _____
   COMPANY: _____
   BY: _____ TITLE: _____
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CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273

CONSULTANT

STATE OF ALASKA — 49TH — MICAH K. SCHOMING — CE - 10568 — 2/20/13 — REGISTERED PROFESSIONAL ENGINEER

SEAL

ML&P

MUNICIPAL LIGHT & POWER

SOUTH STAGING & STORAGE AREA AND GAS PIPING UPGRADES

SCHD: A

Alternative 2 **SITE PLAN - EAST**

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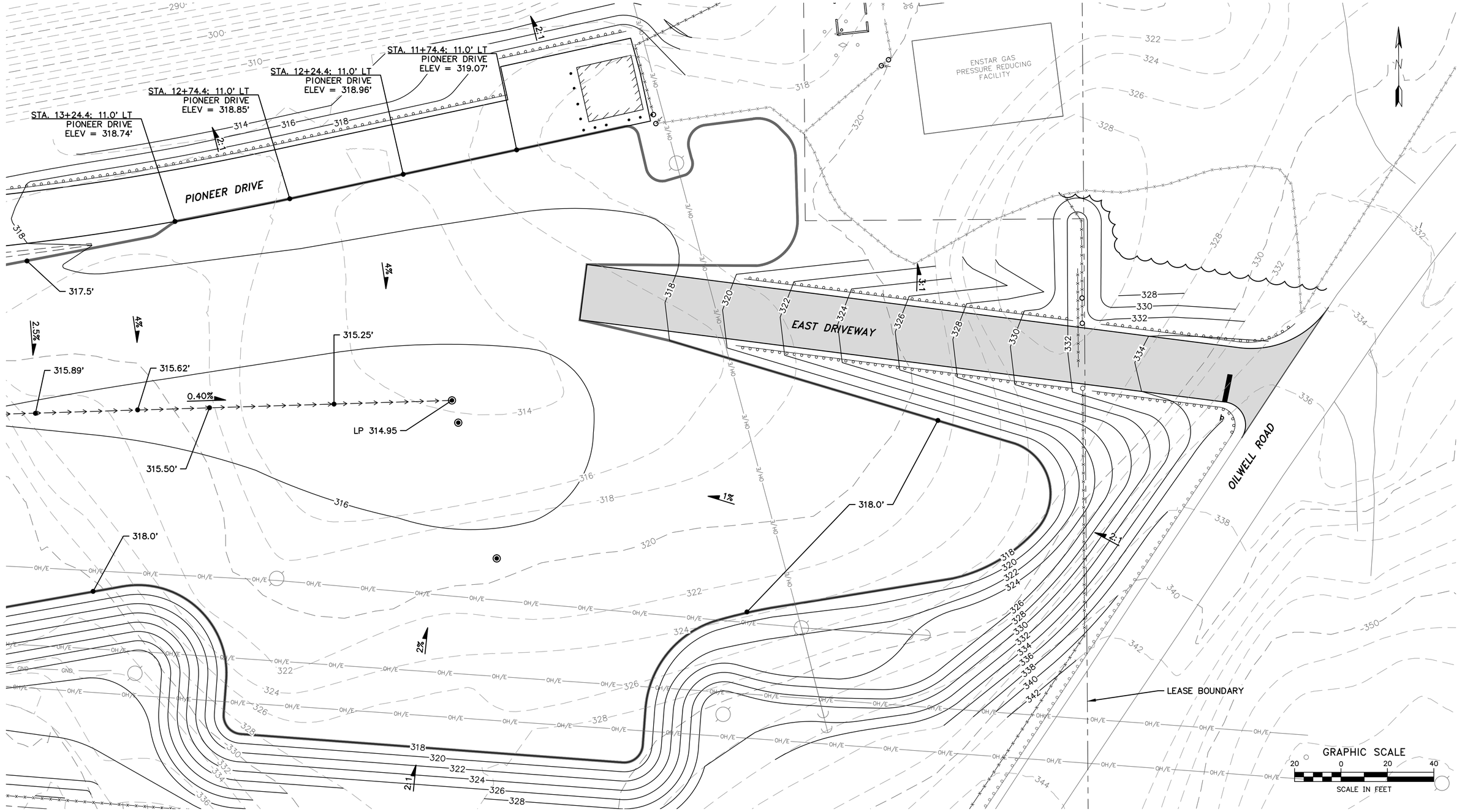
VERT SCALE: N/A			
PROJ. ID.:			



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FULL SIZE SCALE
HORZ SCALE:
VERT SCALE:

DATA	DRAWN BY	CHECKED BY	DATA	DRAWN BY	CHECKED BY
BASE			TELEPHONE		
TOPOGRAPHY			ELECTRIC		
PROFILE			CABLE TV		
SANITARY SEWER			TRAFFIC SIGNAL		
STORM SEWER			DESIGN		
WATER			QUANTITIES		
GAS			MUN. FINAL CHECK		

PLAN CHECK

REV	DATE	DESCRIPTION	BY

REVISIONS

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CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
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STATE OF ALASKA
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MICAH K. SCHOMING
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2/20/13
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SCHD: A

SOUTH STAGING & STORAGE AREA AND GAS PIPING UPGRADES

Alternative 2

GRADING & DRAINAGE PLAN - EAST

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VERT SCALE: N/A			
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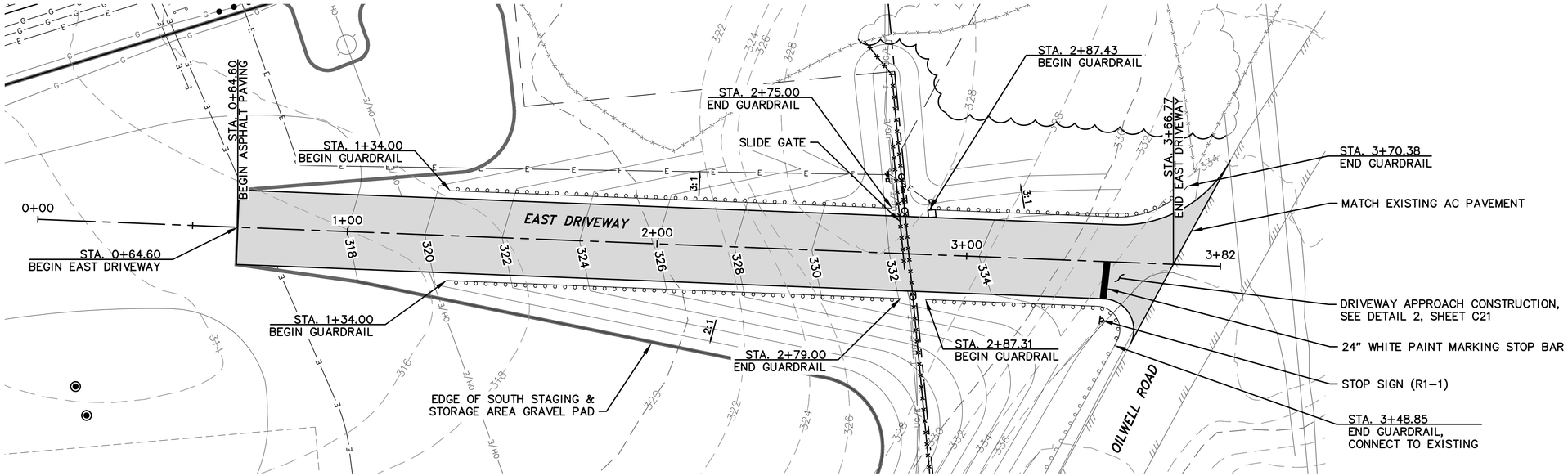

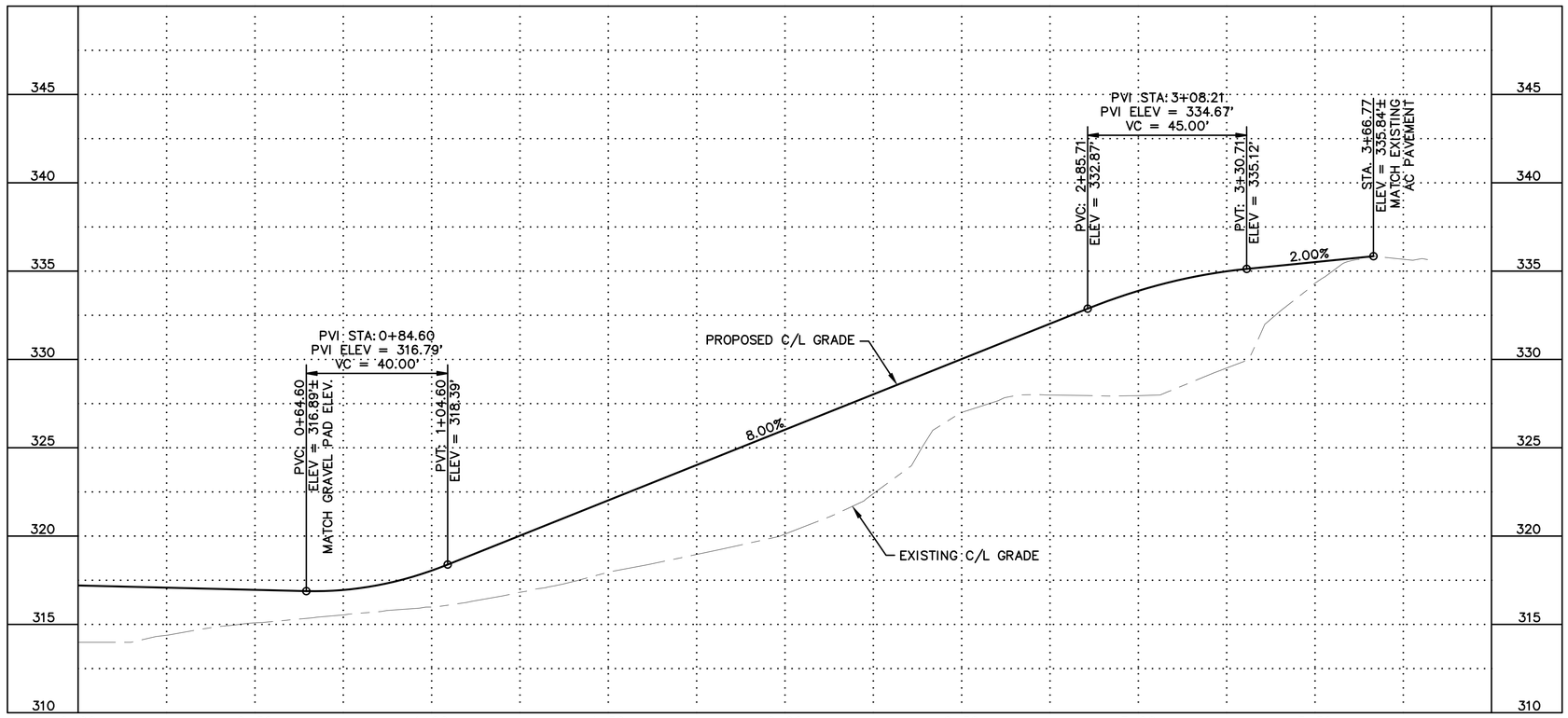

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PROFILE			CABLE TV		
SANITARY SEWER			TRAFFIC SIGNAL		
STORM SEWER			DESIGN		
WATER			QUANTITIES		
GAS			MUN. FINAL CHECK		
PLAN CHECK					

REV	DATE	DESCRIPTION	BY
REVISIONS			

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CRW ENGINEERING GROUP, LLC
3940 ARCTIC BLVD. SUITE 300
ANCHORAGE, ALASKA 99503
PHONE: (907) 562-3252
FAX: (907) 561-2273
CONSULTANT

STATE OF ALASKA 49TH MICAH K. SCHOMING CE - 10568 2/20/13 REGISTERED PROFESSIONAL ENGINEER
SEAL

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MUNICIPAL LIGHT & POWER

SCHD: A

SOUTH STAGING & STORAGE AREA AND GAS PIPING UPGRADES

Alternative 2 **EAST DRIVEWAY PLAN & PROFILE**

HORZ SCALE: 1"=20' VERT SCALE: 1"=4'	DATE: 2/23/13	GRID: 1142	SHEET C14 of C26
PROJ. ID.:			

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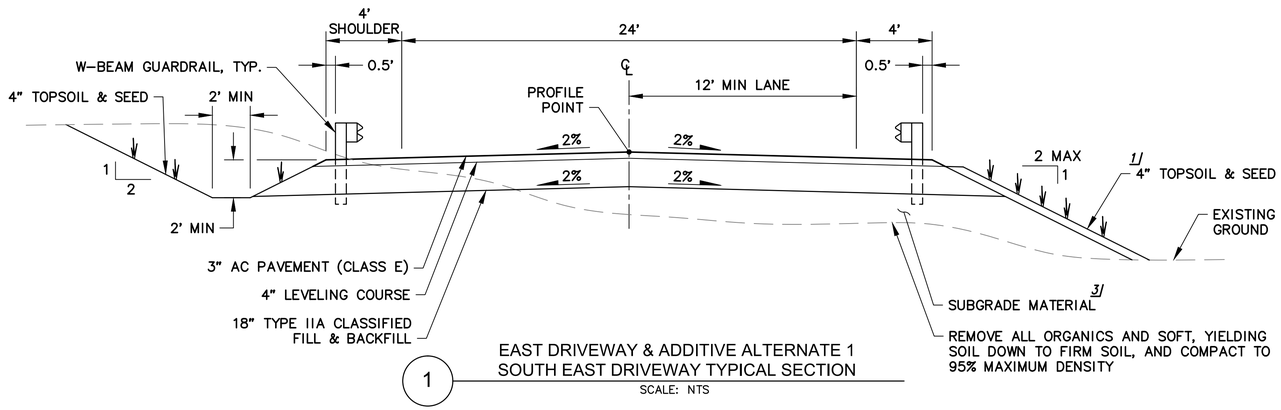
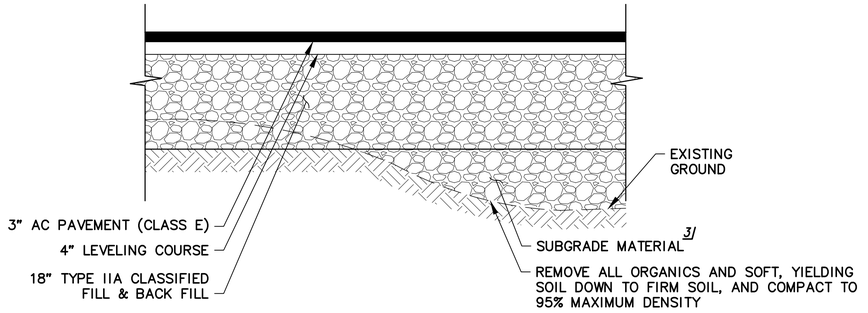


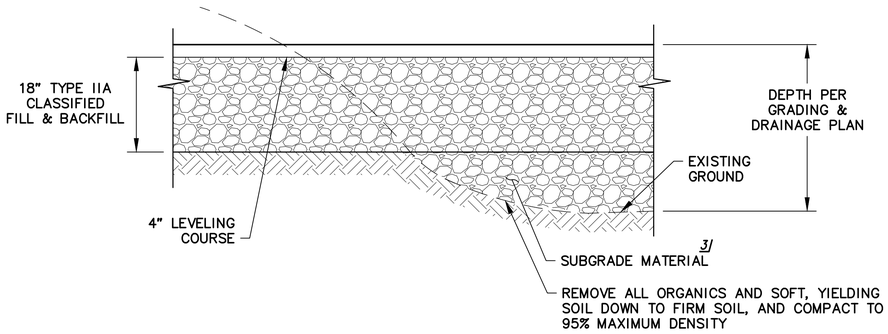
1 EAST DRIVEWAY & ADDITIVE ALTERNATE 1 SOUTH EAST DRIVEWAY TYPICAL SECTION
SCALE: NTS



2 EAST DRIVEWAY TYPICAL SECTION OR ADDITIVE ALTERNATE 1 SOUTHEAST DRIVEWAY TYPICAL SECTION
SCALE: NTS

GENERAL DRIVEWAY NOTES:

1. PLACE 4" OF TOPSOIL AND SEEDING ON ALL CUT AND FILL SLOPES, AS SHOWN.
2. DRIVEWAY CROSS SLOPE SHALL BE 2% UNLESS OTHERWISE NOTED.
3. SUBGRADE MATERIAL SHALL BE NATIVE MATERIAL MEETING TYPE III GRADATION AS APPROVED BY THE ENGINEER. USE TYPE IIA WHEN APPROVED TYPE III IS NOT AVAILABLE.



3 SOUTH STAGING AND STORAGE AREA TYPICAL SECTION
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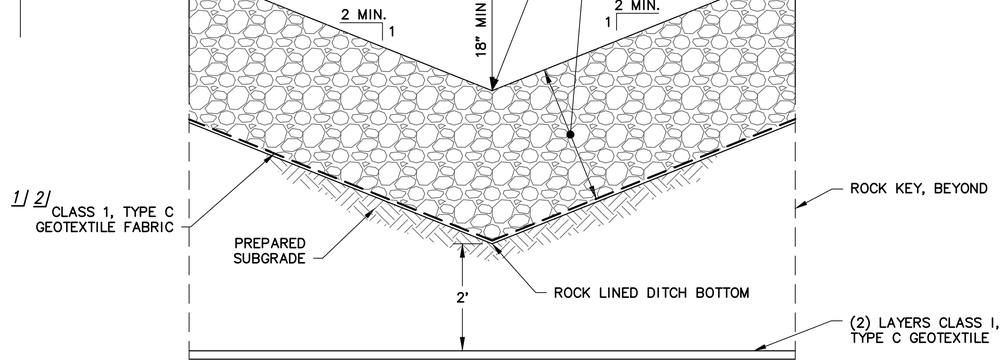
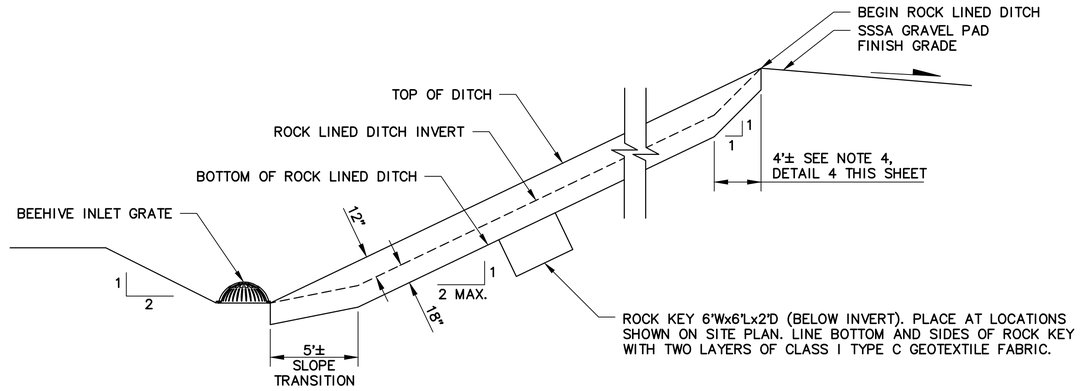


4 ROCK LINED DITCH SECTION
SCALE: NTS

ROCK LINED DITCH NOTES:

1. KEY IN GEOTEXTILE 12" VERTICALLY AT BEGINNING AND END LOCATIONS.
2. NOT INSTALLED AT ROCK KEY LOCATIONS.
3. ROCK KEY MATERIAL SHALL USE CLASS 1 RIPRAP.
4. INSTALL RIPRAP WITH CEMENT OR CONCRETE GROUT FILLING ALL VOID SPACES FOR FULL DEPTH OF ROCK. CONCRETE SHALL HAVE MIN. COMPRESSIVE STRENGTH OF 3500 PSI, 5% AIR ENTRAINMENT AND 2.0 LB/CY OF FIBER MESH.



5 ROCK LINED DITCH PROFILE
SCALE: NTS

VERIFY SCALE THIS BAR REPRESENTS ONE INCH ON ORIGINAL DRAWING. 0" — 1" IF BAR IS NOT ONE INCH, ADJUST DRAWING SCALE ACCORDINGLY. FULL SIZE SCALE HORZ SCALE: VERT SCALE:

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TOPOGRAPHY			ELECTRIC		
PROFILE			CABLE TV		
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STORM SEWER			DESIGN		
WATER			QUANTITIES		
GAS			MUN. FINAL CHECK		

PLAN CHECK

REV	DATE	DESCRIPTION	BY

REVISIONS

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MICAH K. SCHOMING
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2/20/13
SEAL

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SCHD: A

SOUTH STAGING & STORAGE AREA AND GAS PIPING UPGRADES

TYPICAL SECTIONS

HORZ SCALE: N/A | VERT SCALE: N/A | DATE: 2/23/13 | GRID: 1142 | PROJ. ID.:

SHEET C21 of C26

PLOT DATE: 2/23/2013 8:12 PM

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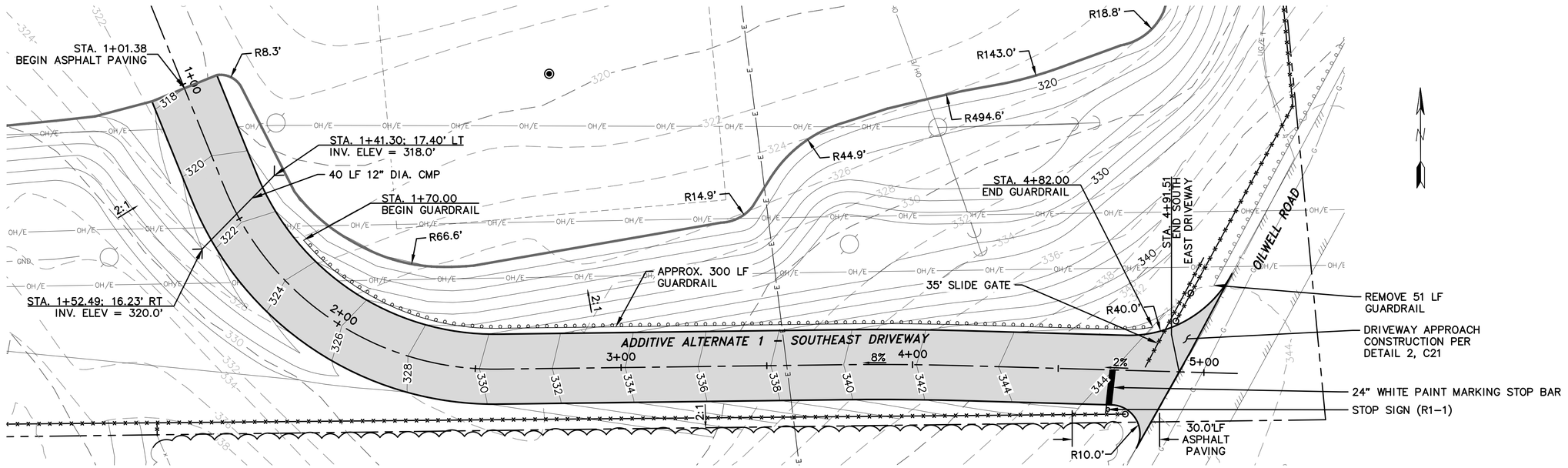

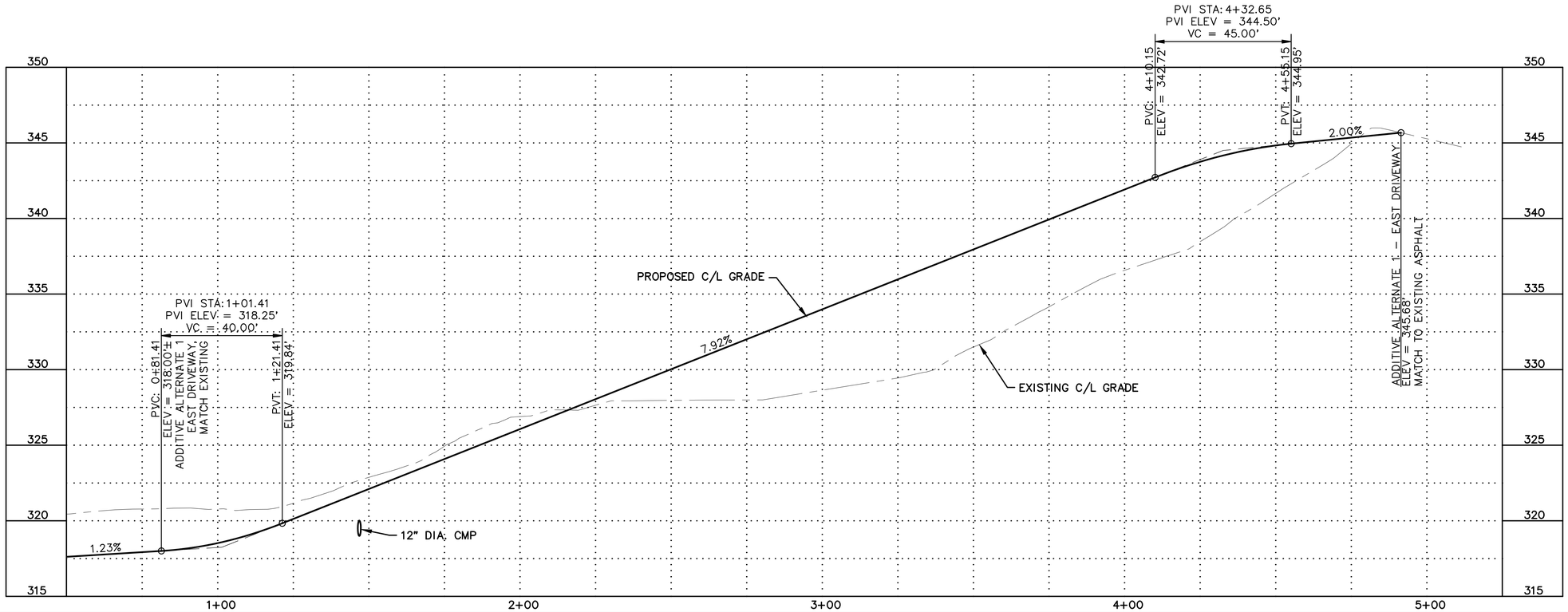

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FULL SIZE SCALE
HORZ SCALE:
VERT SCALE:

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PROFILE			CABLE TV		
SANITARY SEWER			TRAFFIC SIGNAL		
STORM SEWER			DESIGN		
WATER			QUANTITIES		
GAS			MUN. FINAL CHECK		

PLAN CHECK

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CONSULTANT

STATE OF ALASKA 49TH
MICAH K. SCHOMING
CE - 10568
2/20/13
REGISTERED PROFESSIONAL ENGINEER
SEAL

ML&P

MUNICIPAL LIGHT & POWER

SOUTH STAGING & STORAGE AREA AND GAS PIPING UPGRADES

SCHD: C

Alternative 3

DRIVEWAY PLAN & PROFILE

HORZ SCALE: 1"=20'
VERT SCALE: 1"=4'
DATE: 2/23/13
GRID: 1142
PROJ. ID.:
SHEET C25 of C26

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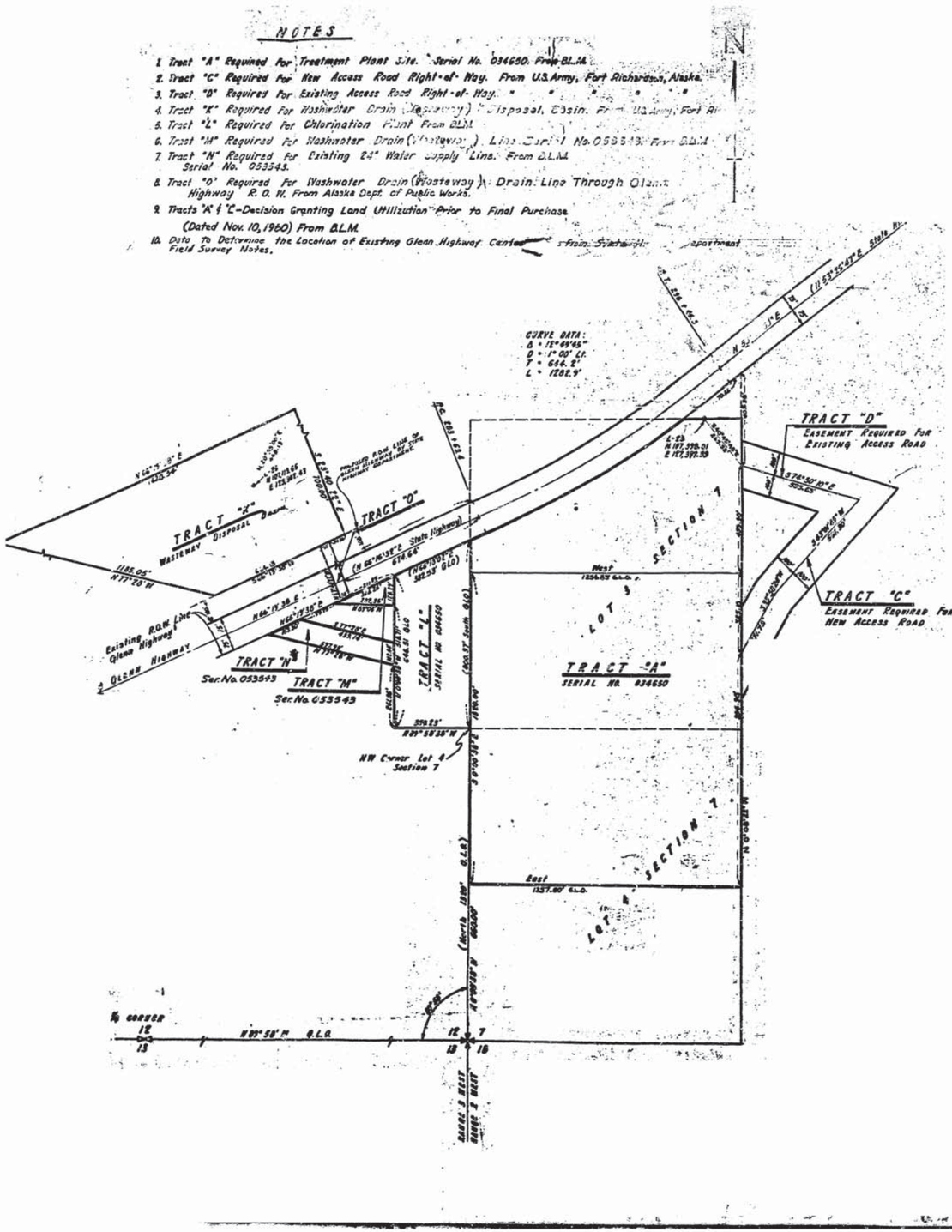
NOTES

1. Tract "A" Required For Treatment Plant Site. Serial No. 034650. From BLM.
2. Tract "C" Required For New Access Road Right-of-Way. From U.S.Army, Fort Richardson, Alaska.
3. Tract "D" Required For Existing Access Road Right-of-Way. " " " " " "
4. Tract "K" Required For Washwater Drain (Wasteway) Disposal Basin. From U.S.Army, Fort Ri
5. Tract "L" Required For Chlorination Plant From BLM.
6. Tract "M" Required For Washwater Drain (Wasteway) Line Serial No. 033543. From BLM.
7. Tract "N" Required For Existing 24" Water Supply Line. From BLM. Serial No. 033543.
8. Tract "O" Required For Washwater Drain (Wasteway) & Drain Line Through Glenn Highway R.O.W. From Alaska Dept. of Public Works.
9. Tracts "A" & "L"-Decision Granting Land Utilization Prior to Final Purchase (Dated Nov. 10, 1960) From B.L.M.
10. Data To Determine the Location of Existing Glenn Highway Center From State Dept. Field Survey Notes.



LEGAL DESCRIPTION FOR EASEMENT REQUIRED FOR EXISTING ACCESS ROAD

TRACT "D"

A Portion Of The SE ¼ Of Section 12, T13N, R3W, S.M., Alaska, South Of The Right-of-Way Of The Glenn Highway, More Particularly Described As Follows:

Beginning at the Corner Common to Sections 7 and 18, T13 N, R2 W, S.M. and Sections 12 and 13, T13N, R3W, S.M.; Thence N 0° 00' 38" W along the East Section Line a Distance of 1320 Feet More or Less to a Point on the North Boundary of Section 12, T13 N, R3 W, S.M. Identical with the Northwest Corner of Lot 4, Section 7, T13N, R2W, S.M.; Thence N 89° 58' 38" W, a Distance of 350.25 Feet; Thence N 0° 00' 38" W, a Distance of 261.36 Feet to the Point of Beginning of the Required Easement, Thence N 77° 25' E a Distance of 592.98 Feet to a Point on the Existing Right-of-Way Line of the Glenn Highway; Thence Along the Existing South Right-of-Way Line of the Highway, a Distance of 167.30 Feet; Thence S 77° 25' W a Distance of 492.14 Feet; Thence S 0° 00' 38" E a Distance of 102.44 Feet to the Point of Beginning.

The Above Described Tract of Land Contains 1.19 Acres More or Less.

LEGAL DESCRIPTION FOR EASEMENT REQUIRED FOR EXISTING 24" WATER SUPPLY LINE

TRACT "N"

That Portion of the SE ¼ of Section 12, T13 N, R3 W, S.M., Lying South of the Right-of-Way of the Glenn Highway More Particularly Described As Follows:

Beginning at the Corner Common to Sections 7 and 18, T13 N, R2 W, S.M. and Sections 12 and 13, T13N, R3W, S.M.; Thence N 0° 00' 38" W along the East Section Line a Distance of 1320 Feet More or Less to a Point on the North Boundary of Section 12, T13 N, R3 W, S.M. Identical with the Northwest Corner of Lot 4, Section 7, T13N, R2W, S.M.; Thence N 89° 58' 38" W, a Distance of 350.25 Feet; Thence N 0° 00' 38" W, a Distance of 261.36 Feet to the Point of Beginning of the Required Easement, Thence N 77° 25' E a Distance of 592.98 Feet to a Point on the Existing Right-of-Way Line of the Glenn Highway; Thence Along the Existing South Right-of-Way Line of the Highway, a Distance of 167.30 Feet; Thence S 77° 25' W a Distance of 492.14 Feet; Thence S 0° 00' 38" E a Distance of 102.44 Feet to the Point of Beginning.

The Above Described Tract of Land Contains 1.19 Acres More or Less.

ENGINEER'S STATEMENT

CHARLES W. TRYCK states he is by occupation a CIVIL ENGINEER employed by the CITY OF ANCHORAGE and made a survey of the WATER TREATMENT PLANT as described and shown on this map; that the survey of said lands was made by him (or under his supervision) on ground under authority, commencing on the 13th day of April 1955, and ending on the 9th day of November 19[illegible], and that such survey is accurately represented upon this map.

Charles W. Tryck
Engineer

APPLICANT'S CERTIFICATE

This is to certify that CHARLES W. TRYCK who subscribed his statement hereon is the person employed by the undersigned to prepare this map, which has been adopted by the applicant as the approximate final location of the works shown; and that this map is filed as a part of the application; and in order that the applicant may obtain benefits of 41 Stat. 1355, 43 USC 959 and I further certify that the rights-of-way herein described are desired for WATER TREATMENT PLANT purposes.

C-237

(SEAL)

CITY OF ANCHORAGE
By [illegible]
APPLICANT
CITY MANAGER
TITLE

ATTEST:

INVASIVE PLANT SPECIES

Invasive Plant Survey Report ML&P

Invasive Species Control and Management Plan ML&P Driveway Construction on Federal Land

INVASIVE PLANT SURVEY REPORT
MUNICIPAL LIGHT & POWER SITE, ANCHORAGE, ALASKA

Prepared for:

CRW Engineering Group LLC
3940 Arctic Blvd, Ste. 300
Anchorage, AK 99503

Prepared by:

HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, AK 99503

July 2013

CONTENTS

Page No.

TABLES

FIGURES

APPENDICES

1.0 Introduction

Municipal Light and Power (ML&P) proposes to construct a new driveway across federal lands from an existing access road that extends southwest from Oilwell Road. The proposed new driveway, shown on Figure 1, would begin at the access road and extend west to the ML&P parcel.

The final driveway on federal land would be approximately 85 feet long and 40 feet wide. (It would continue on Municipality of Anchorage land for an additional 287 feet.) Building the driveway would require clearing and grading 0.20 acre of federal land. The driveway would have a 24-foot-wide asphalt surface, 4-foot-wide gravel shoulders on each side, and approximately 3:1 side slope on the north side and 2:1 side slope on the south side. The final project footprint includes:

- 0.05 acre of asphalt surface
- 0.012 acre of gravel shoulders
- 0.14 acre of slope area revegetated using a native seed mix.

Executive Order 13112 (1999) requires all federal agencies to prevent the introduction of invasive species; provide for their control; and minimize their impacts to the local economy, ecology, and human health. In review of the request for access across land that it administers, Bureau of Land Management (BLM) staff requested that an invasive plant survey be completed for the project site to determine the presence or absence of invasive species. This request complies with a Best Management Practice listed in Appendix C of *BLM – Alaska Invasive Species Management* (BLM 2010). In addition, BLM requested that ML&P develop an invasive species management plan.

This report describes the invasive plant survey methods and results.

2.0 Background

In its *BLM – Alaska Invasive Species Management* document, BLM defines "invasive weed" as "a non-native plant species, whose introduction does or is likely to cause economic or environmental harm or harm to human health. These species may or may not have been designated as a "noxious weed" by the state or county." (BLM 2010) This survey targets any non-native plant species, regardless of their level of invasiveness. Species considered non-native for the purpose of this survey are those listed on the Alaska Exotic Plants Information Clearinghouse (AKEPIC) website at the time of the survey (AKEPIC 2013).

BLM has identified the following as high-priority terrestrial invasive species in AK (BLM 2013):

- Canada thistle — *Cirsium arvense* (L.) Scop. — Invasiveness ranking of 76
- orange hawkweed — *Hieracium aurantiacum* L. — Invasiveness ranking of 79
- European bird cherry — *Prunus padus* L. — Invasiveness ranking of 74
- bird vetch — *Vicia cracca* L. — Invasiveness ranking of 73
- white sweetclover — *Melilotus alba* Medikus — Invasiveness ranking of 81

3.0 Survey Area

The study area for the invasive plant survey is shown on Figure 1. It comprises the area proposed to be disturbed for construction of the driveway, plus the adjacent west margin of the existing

roadway, adjacent areas to the north and west, and a site on BLM land on the east side of the existing access road. In all, this field survey covered approximately 0.8 acre on federal land and 0.3 acre on the ML&P parcel.

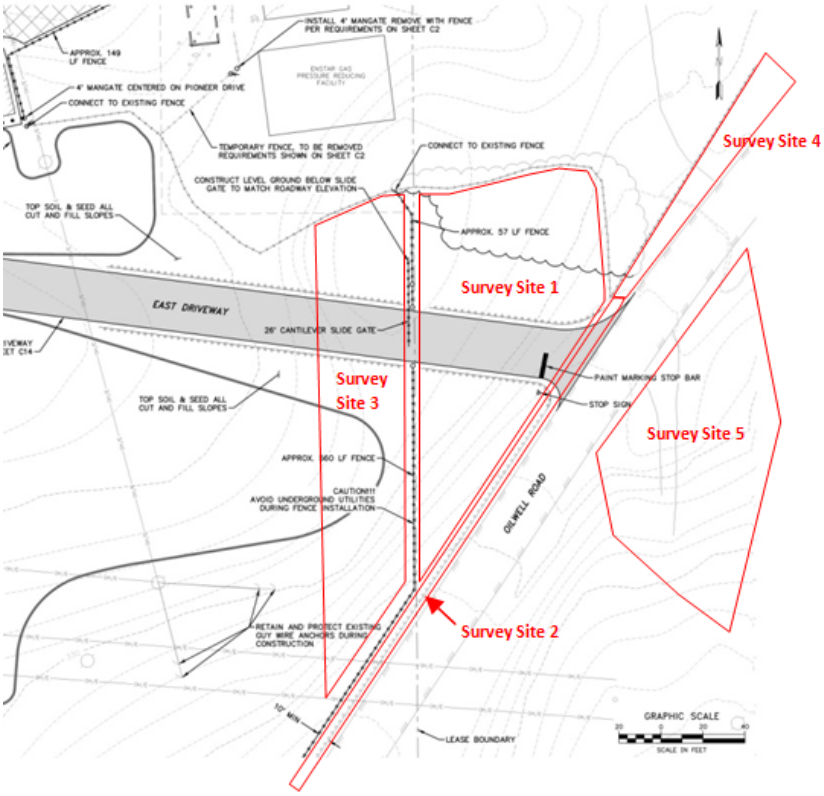


Figure 1. Non-Native Plant Survey Sites Based on ML&P Site Drawing.

4.0 Existing Information

AKEPIC houses records of non-native plants documented throughout Alaska (AKEPIC 2013). A query of this database on July 1, 2013, identified the species in Table 1 as having been documented within a mile of the study area.

Table 1. Non-Native Plant Species Documented within One Mile of the Study Area

Scientific Name	Common Name	Family	Invasiveness	Number of Infestations
Bromus inermis Leyss.	smooth brome	Poaceae	62	13
Cirsium arvense (L.) Scop.	Canada thistle	Asteraceae	76	6
Crepis tectorum L.	narrowleaf hawksbeard	Asteraceae	56	14
Elymus repens (L.) Gould	quackgrass	Poaceae	59	1
Galeopsis tetrahit L.	brittlestem hempnettle	Lamiaceae	50	1
Hieracium umbellatum L.	narrowleaf hawkweed	Asteraceae	51	4
Hordeum jubatum L.	foxtail barley	Poaceae	63	3

Scientific Name	Common Name	Family	Invasiveness	Number of Infestations
Leucanthemum maximum (Ramond) DC.	shasta daisy	Asteraceae	-	1
Leucanthemum vulgare Lam.	ox-eye daisy	Asteraceae	61	9
Linaria vulgaris P. Mill.	yellow toadflax	Scrophulariaceae	69	21
Lupinus polyphyllus Lindl.	bigleaf lupine	Fabaceae	71	2
Melilotus alba Medikus	white sweetclover	Fabaceae	81	11
Melilotus officinalis (L.) Lam.	yellow sweetclover	Fabaceae	69	1
Persicaria lapathifolia (L.) Gray	curlytop knotweed	Polygonaceae	47	1
Phalaris arundinacea L.	reed canarygrass	Poaceae	83	3
Prunus padus L.	European bird cherry	Rosaceae	74	1
Senecio vulgaris L.	common groundsel	Asteraceae	36	1
Sonchus arvensis L.	perennial sowthistle	Asteraceae	73	1
Silene chalcedonica (L.) E. H. L. Krause	Maltesecross	Caryophyllaceae	42	1
Tanacetum vulgare L.	common tansy	Asteraceae	60	10
Taraxacum officinale ssp. *officinale* F.H. Wigg.	common dandelion	Asteraceae	58	14
Trifolium hybridum L.	alsike clover	Fabaceae	57	2
Trifolium repens L.	white clover	Fabaceae	59	2
Vicia cracca L. ssp. *Cracca*	bird vetch	Fabaceae	73	17

Table 1 shows non-native species' invasiveness ranks, which indicate the ability of a plant to establish itself in an undisturbed native community and outcompete native vegetation. The ranks are scaled from 0 to 100; plants that pose no threat to native ecosystems are at the low end and plants that pose a major threat to native ecosystems are at the high end (Carlson et al. 2008).

Although such species as foxtail barley (*Hordeum jubatum*) and bigleaf lupine (*Lupinus polyphyllus*) are included in the AKEPIC records, scientists are debating whether these species are actually native to Alaska.

5.0 Methods

Scientists examined the full project footprint plus some adjacent areas for the presence of invasive plant species. They divided the study area into five sections ('sites') based on the existing and proposed types and levels of disturbance. These sections are numbered on Figure 1. The scientists meandered through each site, identifying each plant species and listing those that are or might be non-native on the standard AKEPIC data collection form. For each non-native plant species, they completed the AKEPIC data form with information on the infestation size, canopy cover, and an approximate stem count. These data forms are shown in Appendix A.

An infested area was defined by the actual perimeter of each invasive plant infestation within each survey site. For example, in a one-acre survey site, a single toadflax plant would have a 0.001-acre infestation size, while a widespread population of common dandelion would have a one-acre infestation size. Canopy coverage was an ocular estimate of the percentage of ground covered by the foliage of the invasive plant for the infested area.

The investigators took digital photos (in Appendix B) at all sites to document disturbance, plant community type, and representative non-native plant infestations. They collected plants for identification in the office and disposed of those plants. No voucher specimens were saved for a permanent collection.

6.0 Results

Survey work was performed on July 2, 3, and 7, 2013. Table 2 presents brief descriptions of the survey sites, which are shown on Figure 1.

Table 2. Description of Survey Sites

Survey Site	Description	Existing Condition	Approximate Size (acres)	Non-Native Plants Present?
1	Proposed location of driveway surface on BLM land, areas of related cut and fill to the north and south, and area north of the proposed cut and fill to an existing fence on the north and northeast sides.	Mostly undisturbed land. Closed paper birch forest. The westernmost approximately 15 feet (based on survey staking) is slightly disturbed by recent clearing on ML&P land.	0.3	Yes, only along fencelines on north and northeast sides.
2	Road shoulder, 5 feet on each side of guard rail in area proposed for disturbance and south.	Recurrent disturbance of traffic, snow removal. Partially shaded.	0.05	Yes, throughout.
3	Cleared powerline corridor on ML&P parcel, immediately west of the parcel boundary.	Recently cleared and graded for installation of a powerline, mostly unvegetated.	0.3	Yes. Scattered dandelion seedlings.
4	Waste area between existing access road and fence, north of the proposed driveway.	Moist herbaceous, early seral vegetation.	0.1	Yes, heavily infested with several non-native species.
5	Area east of the existing access road, across from proposed driveway entrance.	Disturbed by historic clearing, burial of gas line, existing vehicle tracks and trails.	0.4	Yes, infested with several non-native species in open areas.

Table 3 lists the non-native plant species found in each of the survey sites.

Table 3. Non-Native Plant Species Found at Survey Sites

Scientific Name	Common Name	Invasiveness	Survey Site				
			1	2	3	4	5
Bromus inermis Leyss.	smooth brome	62				X	
Elymus repens (L.) Gould	quackgrass	59				X	
Hordeum jubatum L.	foxtail barley	63		X		X	
Leucanthemum vulgare Lam.	ox-eye daisy	61	X	X		X	X
Linaria vulgaris P. Mill.	yellow toadflax (butter and eggs)	69				X	
Matricaria discoidea DC	pineappleweed	32		X		X	X
Phleum pratense L.	timothy	54		X		X	X
Plantago major L.	common plantain	44		X		X	X
Poa pratensis L. ssp. *Pratensis*	Kentucky bluegrass	52				X	
Taraxacum officinale ssp. *officinale* F.H. Wigg.	common dandelion	58	X	X	X	X	X
Trifolium hybridum L.	alsike clover	57		X		X	
Trifolium pratense L.	red clover	53				X	X

Scientific Name	Common Name	Invasiveness	Survey Site				
			1	2	3	4	5
Trifolium repens L.	white clover	59		X		X	X
Vicia cracca L. ssp. *cracca*	bird vetch	73				X	X

Survey site 1 is undisturbed paper birch forest. Non-native plant species were found only along the borders of site 1. Dandelion and ox-eye daisy were found only along the fence line along the site's north and northeast boundaries. The non-native plants were mostly within two feet of the fence, but some dandelions were found as far as about seven feet from the fence. The property on the opposite side of the fence is gravel-surfaced and infested with many weeds.

Survey site 2 is the west margin of the existing access road, from the pavement edge to approximately five feet on the opposite side of the guardrail. It extends approximately 275 feet south from the north side of the proposed driveway. The area is mostly shaded. It supports many non-native species, but none were observed to be invading the adjacent lands.

Survey site 3 is on ML&P land, just west of the boundary with BLM land. It has recently been cleared and partially graded for installation of a powerline. Native plants are reestablishing from plants under shallow soil deposits. Dandelion seedlings were present throughout this area.

Survey site 4 lies on the west side of the existing access road, immediately north of the proposed driveway entrance. It extends from the edge of the pavement to a fence enclosing natural gas infrastructure. The site is heavily infested with many non-native plant species. This site was selected for survey because of the prominence of non-native plants that could serve as a source of weeds at the proposed driveway site. The area is probably subject to occasional physical disturbance (based on the lack of shrubs), has a mineral substrate, and is fully exposed to sunlight.

Survey site 5 was selected as representative of a nearby disturbed area not expected to be affected by the proposed driveway project. It is located on the east side of the existing access road, directly across from the proposed driveway entrance. It lies within an approximately 100-foot-wide cleared swath that runs north-south along the east side of the densely developed part of northeast Anchorage. It includes a short vehicle trail, some foot trails, and a buried natural gas line. It is a mosaic of alder thickets and open herbaceous areas supporting many non-native species. The open areas are moderately infested with several non-native species.

7.0 Discussion

Most of the proposed driveway site on BLM-managed land is presently undisturbed and does not support non-native plant species. Non-native plant infestations exist on all of the site's margins but none of the infestations has spread into the forested area. Survey of adjacent areas shows that non-native species are well established in the vicinity. These species include the highly invasive bird vetch and the moderately invasive yellow toadflax. The BLM has designated bird vetch as a high-priority terrestrial invasive species in AK (BLM 2013).

BLM has asked ML&P to prepare an invasive plant control and management plan. The results of this non-native plant survey will inform that plan.

References

Alaska Exotic Plant Information Clearinghouse (AKEPIC). 2013. Alaska Exotic Plant Information Clearinghouse database (http://aknhp.uaa.alaska.edu/maps/akepic/). Alaska Natural Heritage Program, University of Alaska, Anchorage. Accessed July 1, 2013.

Alaska Natural Heritage Program (AKNHP), University of Alaska Anchorage. 2012. *Identification of Non-Native Plants in Alaska*. University of Alaska Anchorage, Anchorage, Alaska. 241 pp.

Carlson, M.L., I.V. Lapina, M. Shephard, J. S. Conn, R. Densmore, P. Spencer, J. Heys, J. Riley and J. Nielsen. 2008. *Invasiveness Ranking System for Non-native Plants of Alaska*. USDA Forest Service, R10-TP-143. 218 pp.

Executive Order 13112. 1999. Federal Register: February 3, 1999 (Volume 64, Number 25).

U.S. Department of the Interior, Bureau of Land Management. 2010. *BLM – Alaska Invasive Species Management*. Alaska State Office, Anchorage, Alaska.

—. 2013. High Priority Terrestrial (Land) Invasive Species in Alaska. Accessed at: http://www.blm.gov/ak/st/en/prog/invasive_species/noxweeds/ak_priority_weeds.html on July 1, 2013.

Appendix A

AKEPIC Field Data Sheets

AKEPIC Field Data Sheet (2010)

**Survey Date: 07 / 02 /2013 (mm / dd / yyyy) **Observers: Leggett, A; Goldberg, D. (Last Name, First Name Initial. (e.g.: Smith, J.; Williams, R.)

**Required Field

Observers Affiliation *(circle one)*:
AACD_IPC AKNHP ARS BLM CES CWMA DOD DOWL (HDR) NPS PMC SCS TECI UAF USFS USFWS USGS Other

A. Site Information

** Site Code: MLPD13-0001
Visit Type *(circle one)*: (Reconnaissance) Monitoring Research Control
Is this a Revisit *(circle one)*: Yes (No)
** Study Type *(circle one)*: (Exhaustive species Inventory) Highest priority species Single species study
** Area Surveyed: 10.3 (acres)
(Note: 1/10 acre = 37 ft radius, 1/2 acre = 83 ft radius, 1 acre = 118 ft radius)
Site Vegetation Community Description (level IV Viereck et al. 1992): closed birch IBld
Disturbance Type (see instructions below): Other Mechanical Substrate Alteration

B. Location Information

** Latitude: 61.22908 (Decimal Degrees, NAD83)
** Longitude: 149.71117 (Decimal Degrees, NAD83)
Elevation: 323 (ft)
** Collection Method *(circle one)*: (GPS) Topographic Map Aerial Photo
** GPS precision: 25' (ft; 0-5, (0-30), 0-100, 0-1000, 1000+)
Topographic Map Source: _____ Scale: _____ Date: _____
Quad name: _____ Quad number: _____ (i.e. A-1, B-2, C-3, D-4)
Notes (location): South of gas valves on west side of access road between Oilwell Rd and AWWU Ship Creek water treatment plant. Area on BLM land proposed for driveway construction. Presently undisturbed except along margins: access road on east, fenceline on north, recent clearing on southwest. Survey does not included 10' along the paved road. SW 15' margin has had tree clearing in past 2 months, but little ground disturbance.

C. Survey Information

** Plant Species Code *(see below)*	**Infested Area (acres) *(see below)*	**Canopy Cover (% cover) *(see below)*	Disturbance Age (yrs.)	Stem Count *(see below)*	**Herbarium *(see below)*	Control Action *(see below)*	Aggressiveness *(see below)*
LEVU	0.0001	10		1-5			
TAOF	0.03	1		51-150			

D. Notes (species): Dandelion and daisy found only along fenceline

AKEPIC Field Data Sheet (2010)

**Survey Date: 07/02/2013 (mm / dd / yyyy) **Observers: Leggett, A.; Goldberg, D. (Last Name, First Name Initial. (e.g.: Smith, J.; Williams, R.)

**Required Field

Observers Affiliation *(circle one)*:
AACD_IPC AKNHP ARS BLM CES CWMA DOD DOWL (HDR) NPS PMC SCS TECI UAF USFS USFWS USGS Other

A. Site Information

** Site Code: MLPD13-0002
Visit Type *(circle one)*: (Reconnaissance) Monitoring Research Control
Is this a Revisit *(circle one)*: Yes (No)
** Study Type *(circle one)*: (Exhaustive species inventory) Highest priority species Single species study
** Area Surveyed: 0.05 (acres)
(Note: 1/10 acre = 37 ft radius, 1/2 acre = 83 ft radius, 1 acre = 118 ft radius)
Site Vegetation Community Description (level IV Viereck et al. 1992): 2B2b
Disturbance Type (see instructions below): Fill importation

B. Location Information

** Latitude: 61.22905 (Decimal Degrees, NAD83)
** Longitude: 149.71097 (Decimal Degrees, NAD83)
Elevation: 331 (ft)
** Collection Method *(circle one)*: (GPS) Topographic Map Aerial Photo
** GPS precision: 10' (ft; 0-5, (0-30), 0-100, 0-1000, 1000+)
Topographic Map Source: _____ Scale: _____ Date: _____
Quad name: _____ Quad number: _____ (i.e. A-1, B-2, C-3, D-4)

Notes (location): Road margin On west side of access road from Oilwell Rd to the AWWU Ship Creek water treatment plant. Starting at north end at tip of fence enclosing Enstar gas vault and running south along road approx. 275 ft, est. 10' wide, including area on forest side of guardrail.

C. Survey Information

** Plant Species Code *(see below)*	**Infested Area (acres) *(see below)*	**Canopy Cover (% cover) *(see below)*	Disturbance Age (yrs.)	Stem Count *(see below)*	**Herbarium *(see below)*	Control Action *(see below)*	Aggressiveness *(see below)*
TAOF	0.05	1		151-500			
MADI6	0.05	1		151-500			
ELMA2	0.05	1		51-150			
TRHY	0.05	1		6-25			
JUJU	0.001	10		26-50			
[illegible]3	0.05	1		26-50			
LEVU	0.05	1		6-25			
TRRE3	0.05	1		51-150			

D. Notes (species): _____

AKEPIC Field Data Sheet (2010)

**Survey Date: 07 / 02 / 2013 (mm / dd / yyyy) **Observers: Leggett, A.; Goldberg, D. (Last Name, First Name Initial. (e.g.: Smith, J.; Williams, R.))

**Required Field

Observers Affiliation *(circle one)*:
AACD_IPC AKNHP ARS BLM CES CWMA DOD DOWL (HDR) NPS PMC SCS TECI UAF USFS USFWS USGS Other

A. Site Information

** Site Code: MLPD13-0003
Visit Type *(circle one)*: (Reconnaissance) Monitoring Research Control
Is this a Revisit *(circle one)*: Yes (No)
** Study Type *(circle one)*: (Exhaustive species Inventory) Highest priority species Single species study
** Area Surveyed: 0.3 (acres)
(Note: 1/10 acre = 37 ft radius, 1/2 acre = 83 ft radius, 1 acre = 118 ft radius)
Site Vegetation Community Description (level IV Viereck et al. 1992): 3B2a
Disturbance Type (see instructions below): Other Mechanical Substrate Alteration or Removal.

B. Location Information

** Latitude: 61.22910 (Decimal Degrees, NAD83)
** Longitude: 149.71158 (Decimal Degrees, NAD83)
Elevation: 329 (ft)
** Collection Method *(circle one)*: (GPS) Topographic Map Aerial Photo
** GPS precision: 12 (ft; 0-5, 0(30)0-100, 0-1000, 1000+)
Topographic Map Source: _____ Scale: _____ Date: _____
Quad name: _____ Quad number: _____ (i.e. A-1, B-2, C-3, D-4)

Notes (location): recently cleared area under powerline, on west side of MLP/BLM boundary. 240' long from access road to existing fence; ~50' wide

C. Survey Information

** Plant Species Code *(see below)*	**Infested Area (acres) *(see below)*	**Canopy Cover (% cover) *(see below)*	Disturbance Age (yrs.)	Stem Count *(see below)*	**Herbarium *(see below)*	Control Action *(see below)*	Aggressiveness *(see below)*
TAOF	0.3	1	< 2 months	51-150			

D. Notes (species): Dandelions taking root, apparently from seed. A tiny grass becoming established but too small to identify

AKEPIC Field Data Sheet (2010)

**Survey Date: 07 / 02 / 2013 (mm / dd / yyyy) **Observers: Leggett, A; Goldberg, D. (Last Name, First Name Initial. (e.g.: Smith, J.; Williams, R.)

**Required Field

Observers Affiliation *(circle one)*:
AACD_IPC AKNHP ARS BLM CES CWMA DOD DOWL (HDR) NPS PMC SCS TECI UAF USFS USFWS USGS Other

A. Site Information

** Site Code: MLPD13-0004
Visit Type *(circle one)*: (Reconnaissance) Monitoring Research Control
Is this a Revisit *(circle one)*: Yes (No)
** Study Type *(circle one)*: (Exhaustive species Inventory) Highest priority species Single species study
** Area Surveyed: 0.1 (acres)
(Note: 1/10 acre = 37 ft radius, 1/2 acre = 83 ft radius, 1 acre = 118 ft radius)
Site Vegetation Community Description (level IV Viereck et al. 1992): 3A2b
Disturbance Type (see instructions below): Other Mechanical Substrate Alteration or Removal

B. Location Information

** Latitude: 61.22919 (Decimal Degrees, NAD83)
** Longitude: 149.71075 (Decimal Degrees, NAD83)
Elevation: 335 (ft)
** Collection Method *(circle one)*: (GPS) Topographic Map Aerial Photo
** GPS precision: _____ (ft; 0-5 (0-30) 0-100, 0-1000, 1000+)
Topographic Map Source: _____ Scale: _____ Date: _____
Quad name: _____ Quad number: _____ (i.e. A-1, B-2, C-3, D-4)

Notes (location): Between paved road and fence at Enstar gas valves on access road from Oilwell Rd to the Anchorage Water and Wastewater Utility treatment plant near Ship Creek. Site is 150' long, starting at southern tip of fence and stretching to south end of gate. Measure ~10-25' wide.

C. Survey Information

** Plant Species Code *(see below)*	**Infested Area (acres) *(see below)*	**Canopy Cover (% cover) *(see below)*	Disturbance Age (yrs.)	Stem Count *(see below)*	**Herbarium *(see below)*	Control Action *(see below)*	Aggressiveness *(see below)*
TAOF	0.1	20		500+			
HOMA3	0.1	20		151-500			
EQAR	0.1	5		51-150			
POPR	0.1	5		51-150			
LEVU	0.1	10		151-500			
LIVU2	0.001	5		26-50			
PLMA2	0.1	1		151-500			
VICRC	0.006	20		6-25			
BRINI	0.1	10		151-500			
MATR6	0.1	1		26-50			
TRRE3	0.1	10		151-500			
TRHY	0.02	5		6-25			
TRPR2	0.1	5		6-25			
HIOJU	0.005	5		6-25			

D. Notes (species): Weeds on other side of fence include Leucanthem vulgare, Vicia cracca, Taraxacum officinale, Trifolium repens, Phleum pratense, Linaria vulgaris and Bromus inermis

AKEPIC Field Data Sheet (2010)

**Survey Date: 07 / 07 / 2013 (mm / dd / yyyy) **Observers: Leggett, A. (Last Name, First Name Initial. (e.g.: Smith, J.; Williams, R.)

**Required Field

Observers Affiliation *(circle one)*:
AACD_IPC AKNHP ARS BLM CES CWMA DOD DOWL (HDR) NPS PMC SCS TECI UAF USFS USFWS USGS Other

A. Site Information

** Site Code: MLPD13-0005
Visit Type *(circle one)*: (Reconnaissance) Monitoring Research Control
Is this a Revisit *(circle one)*: Yes (No)
** Study Type *(circle one)*: (Exhaustive species Inventory) Highest priority species Single species study
** Area Surveyed: 0.4 (acres)
(Note: 1/10 acre = 37 ft radius, 1/2 acre = 83 ft radius, 1 acre = 118 ft radius)
Site Vegetation Community Description (level IV Viereck et al. 1992): 3A2b, interspersed with 2B1b
Disturbance Type (see instructions below): Other Mechanical Substrate Alteration

B. Location Information

** Latitude: 61.22909 (Decimal Degrees, NAD83)
** Longitude: 149.71049 (Decimal Degrees, NAD83)
Elevation: 335 (ft)
** Collection Method *(circle one)*: (GPS) Topographic Map Aerial Photo
** GPS precision: _____ (ft; 0-5, (0-30), 0-100, 0-1000, 1000+)
Topographic Map Source: _____ Scale: _____ Date: _____
Quad name: _____ Quad number: _____ (i.e. A-1, B-2, C-3, D-4)

Notes (location): On east side of access road leading from Oil Well Rd to AWWU Ship Creek water treatment plant. Across road from gas valves. Site is buried gas line and remaining trails in wide cleared swath visible on aerial photos. Does not include 20' closest to road. Measures approx. 125' along access road, 100' paralleling gas line, and 200' roughly paralleling fence line back to road

C. Survey Information

** Plant Species Code *(see below)*	**Infested Area (acres) *(see below)*	**Canopy Cover (% cover) *(see below)*	Disturbance Age (yrs.)	Stem Count *(see below)*	**Herbarium *(see below)*	Control Action *(see below)*	Aggressiveness *(see below)*
LE VU	0.4	5		500+			
TA OF	0.4	20		500+			
TR PR2	0.4	1		26-50			
PH PR3	0.4	10		500+			
PL MA2	0.4	1		26-50			
MA DI6	0.4	1		6-25			
TR RE3	0.4	5		500+			
VI CRC	0.4	1		26-50			

D. Notes (species): There are large inclusions of closed alder within this area that are not so weedy.

Appendix B

Survey Site Photographs

Photo 1. Site 1, undisturbed native vegetation site

Photo 2. Site 1, west margin adjacent to clearing on ML&P parcel. No invasive plants.

Photo 3. Site 1, dandelions along north fence line.

Photo 4. Site 2, north end. Invasive plants here include dandelion, daisy, clovers, and squirrel tail grass.

Photo 5. Site 2.

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Photo 6. Site 2.

Photo 7. Site 3, recently cleared. Native vegetation recovering. Scattered dandelion seedlings.

Photo 8. Site 3, recently cleared. Native vegetation recovering. Scattered dandelion seedlings.

Photo 9. Site 4, infestation by many species.

Photo 10. Site 4

Photo 11. Site 4.

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Photo 12. Weeds on parcel west of site 4.

Photo 13. Site 5, infestation of several species.

Photo 14. Site 5, infestation of several species.

Photo 15. Site 5.

Photo 16. Site 5.

Invasive Species Control and Management Plan
ML&P Driveway Construction on Federal Land

1 Purpose

Municipal Light and Power (ML&P) proposes to construct a new driveway across federal land managed by the Bureau of Land Management (BLM). The driveway will provide access to an ML&P parcel. This activity requires clearing and grading 0.20 acre of federal lands. When finished, approximately 0.05 acre of the cleared area will be paved, 0.012 acre will be gravel driveway shoulder, and 0.14 acre will be slopes revegetated with certified weed-free seed of native herbaceous plant species.

BLM suggested that ML&P take a proactive approach to prevent the introduction and spread of invasive species on public land. ML&P must prepare an invasive species management plan that includes: 1) a baseline survey documenting the current status of non-native plants in and adjacent to the proposed project area; 2) implementing best management practices; and 3) ongoing monitoring and mitigation to prevent the establishment and spread of invasive species on the public land. ML&P's consultants have performed a baseline invasive plant survey (HDR 2013). This plan proposes specific strategies to minimize the establishment and spread of invasive plants on BLM land as a result of the driveway construction and use.

2 Description of the Project Site

Existing Conditions

Viewed from a broad perspective, the proposed driveway site is located on the eastern margin of the urban development of the Anchorage Bowl, on its boundary with the less developed lands of Joint Base Elmendorf-Richardson (JBER) (Figure 1). The Anchorage Bowl is abundantly infested with non-native plant species: a simple query of the Alaska Exotic Plant Information Clearinghouse database (AKEPIC 2013) shows approximately 8,700 records of non-native plant infestations in the Anchorage Bowl and 3,900 infestations farther to the northeast within the Municipality of Anchorage. The area east of the proposed driveway site is JBER land actively used by the military for training.

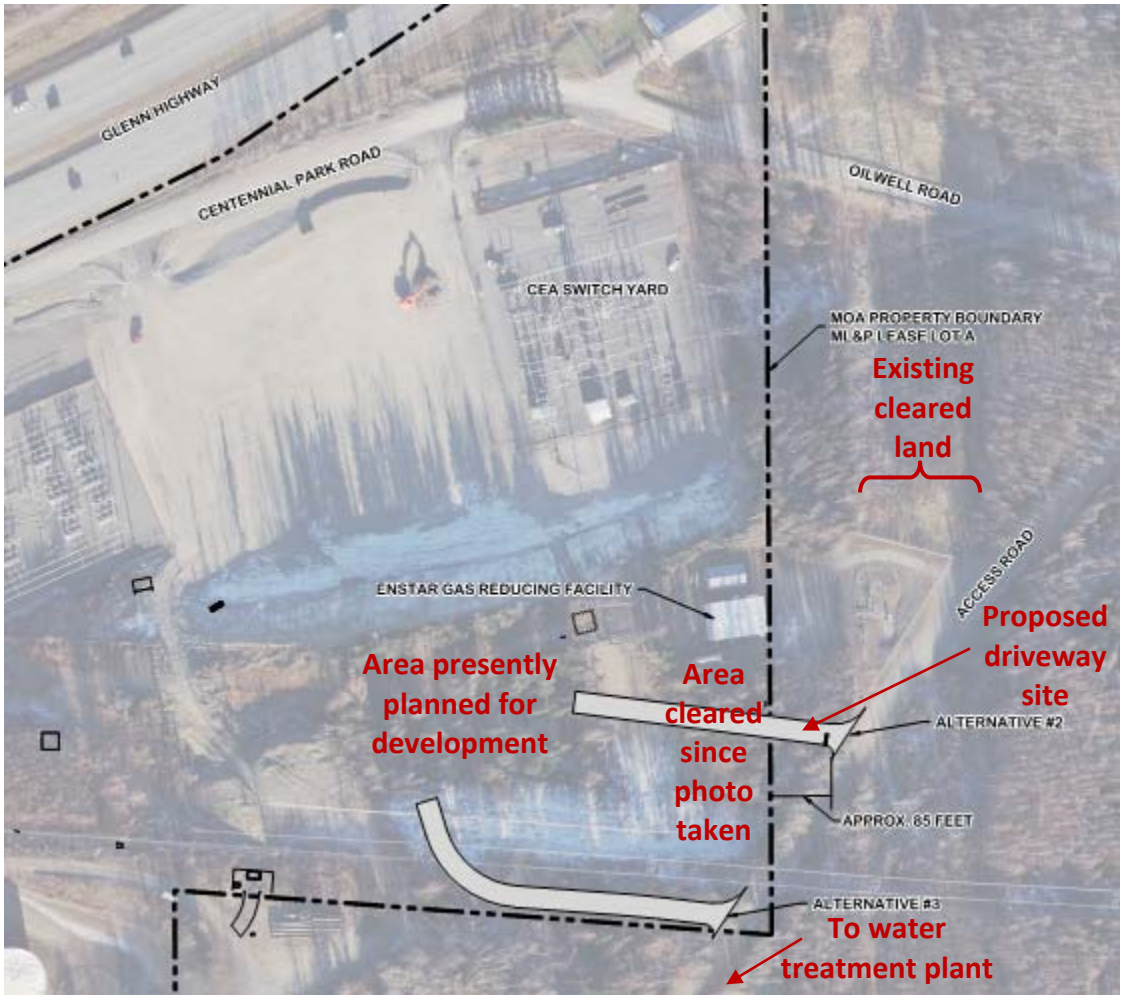
There are no areas of special resource values near the proposed driveway site, such as threatened or endangered species habitat, Research Natural Areas, or Wild and Scenic River corridors. There are no agricultural lands in the vicinity. The nearest natural body of water is Ship Creek, which is approximately 0.9 mile distant. The proposed driveway site does not cross any natural drainageway, nor does surface water flow across the site except potentially down the paved access road from which the driveway will extend. The site does lie near potential vectors of weed dispersal: powerlines, cleared corridors, and the Glenn Highway.

Figure 1. Proposed driveway site in the context of northeast Anchorage Bowl

Viewed from a somewhat closer perspective, the driveway will extend west from an unnamed access road to connect that road and a municipal parcel (Figure 2). That parcel is used by several utilities that provide electricity and water to the people of the Anchorage Bowl. The municipal parcel is almost fully developed, with additional construction underway that will result in most of the parcel surface comprising buildings, gravel pad, asphalt pavement, cleared land under powerlines, and newly revegetated cut and fill slopes. North of the parcel lie Oilwell Road and the Glenn Highway and to its south lie a water treatment plant and ML&P's power plant. The driveway will provide access to development that is filling in between other existing developments; it will not extend into land that will remain in its natural state.

Immediately east of the proposed driveway site are the existing access road, an approximately 100-foot-wide cleared corridor, and JBER land that is used for active training.

Figure 2. Proposed driveway site in context of existing and planned land disturbance (based on a figure from the ML&P project Environmental Assessment)



When viewed in the narrower context of the part of the proposed driveway on BLM land, the site for which ML&P is requesting use is undisturbed forest. A baseline survey conducted in early July 2013 found that the proposed driveway cut-and-fill footprint on BLM land is essentially weed-free (HDR 2013). In that footprint, non-native plants exist just in the existing road shoulder. The margins of the forested area are lightly infested with non-native plants of several species and those infestations are not aggressive; that is, non-native plant infestations do not extend more than a few feet into the undisturbed vegetation.

Weed infestations exist adjacent to the proposed driveway site. The existing access road is lightly infested by several non-native plant species and these were not observed to be extending into adjacent undisturbed land. The west margin of the access road abutting the proposed driveway site on the north is heavily infested with several non-native species, including one of BLM's high-priority invasive species: bird vetch (*Vicia cracca*). That infestation, documented as site 4 in the invasive plant survey report (HDR 2013), is caused or exacerbated by the exposure of mineral substrate, lack of shade, and likely recurring surface disturbance. On the east side of the access road, cleared areas support infestations of several invasive species (site 5 in HDR 2013).

After Driveway Construction

The proposed driveway plans call for most of the remaining forested area between the access road and the municipal parcel to be cleared and graded for the driveway; most of that area will be either paved with asphalt or finished with topsoil and seeded to produce complete herbaceous plant cover. Four-foot-wide shoulders along the paved driveway will be left unvegetated, as gravel surfaces. The driveway will lead onto municipal land that will be cleared and extensively graded to support ML&P functions. The slopes formed by grading around the functional areas will be finished with topsoil and seeded to produce full herbaceous plant cover.

3 Invasive Plant Control and Management Plan

ML&P will employ several strategies on federal land to minimize the establishment of invasive species. These measures are reasonable given that the proposed driveway will not extend development into undisturbed lands, the surrounding land supports little undisturbed native vegetation, the project will disturb a relatively small area on federal land, and ML&P is not a land management agency with staff trained in weed management. The measures to protect against spread of invasive plants are presented below as activities to undertake before, during, and after construction.

Before Construction

An infestation of bird vetch (*Vicia cracca*) – a BLM high-priority species -- exists immediately north of the proposed driveway entrance within site 4 shown in the non-native species survey report (HDR 2013) and attached to this plan. Two methods are acceptable for minimizing the chance of bird vetch spread onto the new driveway area. ML&P may choose either of the following two methods:

1. Remove the bird vetch plants by hand from the west road margin immediately north of the proposed driveway entrance (site 4 in HDR 2013; see Attachment A) to prevent its transport onto the work site. Completely remove each plant being careful to not release any seed, bag the plants, and seal the bags. Dispose of unbroken bags at the municipal landfill or by incineration. OR

2. Fence the site 4 area for the duration of construction to prevent entrance of construction vehicles onto the site and subsequent transport of weed plant parts into the construction area. The area to be fenced stretches east from the south fence corner to within two feet of the asphalt road surface, from there north-northeast paralleling the asphalt surface, then west to the south post of the gate into the fenced area. The fenced-off area will thus include the land west of the access road, stretching from the south tip of the fence to the south side of the gate into the natural gas facility, minus a two-foot-wide shoulder along the access road.

During Construction

Prior to transport either to the ML&P project site (preferred) or to the driveway site on federal land (if the equipment is already on-site), inspect all earthmoving and excavation equipment and clean it of any extraneous soil and debris. Use a high-pressure or power washer to clean all equipment of mud, dirt, and plant parts. Wash equipment again before moving it off the ML&P site.

Reduce soil disturbance and retain native vegetation in and around site to the maximum extent possible.

As soon as is possible after final grading, apply topsoil and seed. The objective is to promote the establishment of desired vegetation to maximize the competitive advantage of those plants over invasive species.

Use weed-free seed for site revegetation. The seed shall be free of noxious weeds as required by Alaska law and shall be 99% weed-free. The seed provider must be able to demonstrate that the seed has been tested to meet these standards. Such seed is available for sale in Anchorage.

Plant only species indigenous to Alaska. This applies also to any trees or shrubs that may be planted on the driveway site. An exception may be made for use of up to 10 percent annual rye grass in the seed mix.

Any straw or mulches to be applied as part of seeding or stabilization must be certified to be weed-seed-free.

After Construction

During the two summers following completion of the driveway, qualified ML&P staff or their designees will survey the driveway site on federal land for infestations of any of the five BLM high-priority species:

- Canada thistle (*Cirsium arvense* (L.) Scop.)
- orange hawkweed (*Hieracium aurantiacum* L.)
- European bird cherry (*Prunus padus* L.)
- bird vetch (*Vicia cracca* L.)
- white sweetclover (*Melilotus alba* Medikus)

July through the beginning of August is the best time for invasive plants survey in Anchorage. If BLM-designated high-priority invasive species are detected on the driveway site on federal land, ML&P or its designee will contact BLM to discuss and develop a management strategy to eradicate infestations and prevent spread of those species to other federal lands. The investigator will also note infestations of other invasive species.

During the two summers following completion of the driveway, qualified ML&P staff or their designees will survey the driveway site on federal land for complete cover of disturbed surfaces by vegetation or plant litter (dead plant material) except for the gravel driveway shoulders. Monitor for possible soil erosion, or places where seeded vegetation failed to establish. Apply additional seed or take other measures to limit exposure of bare soil.

ML&P or its designee will assess the importance of other infestations based on the species' invasiveness and other characteristics of those species' infestations in the vicinity.

ML&P or its designee will share the 2013 invasive plant survey data with BLM and provide it to the Alaska Natural Heritage Program for entering to the AKEPIC database.

4 References

Alaska Exotic Plant Information Clearinghouse (AKEPIC). 2013. Alaska Exotic Plant Information Clearinghouse database (http://aknhp.uaa.alaska.edu/maps/akepic/). Alaska Natural Heritage Program, University of Alaska, Anchorage. Accessed July 1, 2013.

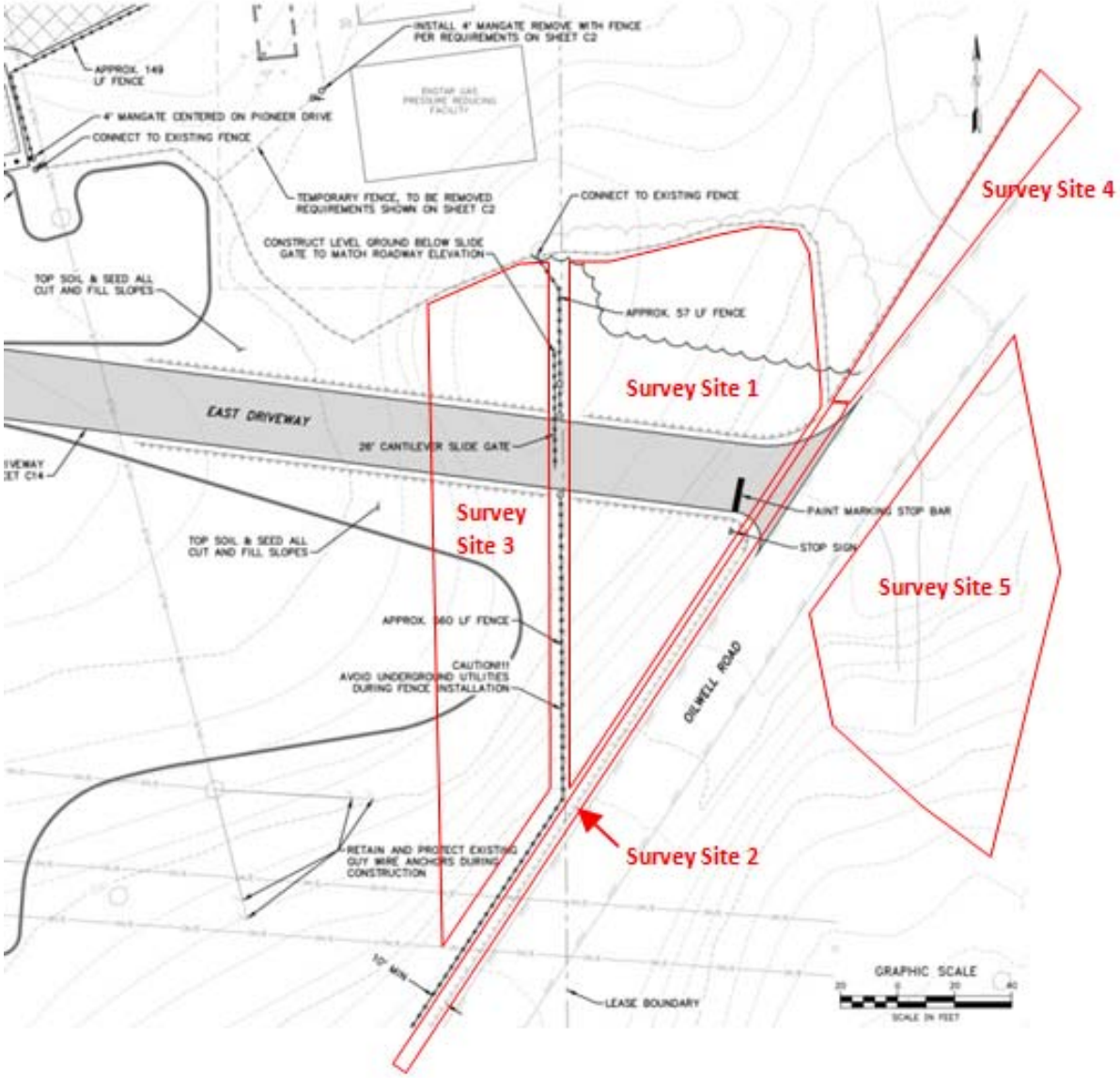
HDR Alaska, Inc. 2013. Invasive Plant Survey Report, Municipal Light & Power Site, Anchorage, Alaska. Prepared for CRW Engineering Group, LLC.

U.S. Department of the Interior, Bureau of Land Management. 2010. BLM – Alaska Invasive Species Management. Alaska State Office, Anchorage, Alaska.

_____. 2013. High Priority Terrestrial (Land) Invasive Species in Alaska. Accessed at: http://www.blm.gov/ak/st/en/prog/invasive_species/noxweeds/ak_priority_weeds.html on July 1, 2013.

Attachment A: Invasive Plant Survey Sites

Source: HDR Alaska, Inc. 2013. *Invasive Plant Survey Report, Municipal Light & Power Site, Anchorage, Alaska.* Prepared for CRW Engineering Group, LLC.



CONSULTATION & COORDINATION

Municipality of Anchorage (MOA) Watershed Management Sign Off

MOA Planning and Zoning Commission Resolution

WMS Archive File Name: 11AWWV Glenn

WMS WATERCOURSE MAPPING SUMMARY

Per the requirements for watercourse verification outlined in Project Management and Engineering Operating Policy and Procedure #8 and Planning Department Operating Policy and Procedure #1 (*effective June 18, 2007*), MOA Watershed Management Services has inspected the following location for the presence or absence of stream channels or other watercourses, as defined in Anchorage Municipal Code (21.35).

- Project Case Number or Subdivision Name: _____
- Project Location, Tax ID, or Legal Description: Tax ID 07406102
  T13N R2W Sec7 Lot8
- Project Area (if different from the entire parcel or subdivision): _____
  8670 Glenn Hwy

In accordance with the requirements and methods identified, WMS verifies that this parcel, project area, or application:

X **DOES NOT** contain stream channels and/or drainageways, as identified in WMS field or archival mapping information.*

_____ **DOES** contain stream channels and/or drainageways ***AND*** these are located and identified on submittal documents in general congruence with WMS field and archival mapping information.
*New or additional mapping **IS NOT REQUIRED**.**

_____ Contains stream channels and/or drainageways ***BUT*** one or more streams or other watercourses:
- are ***NOT*** shown on submittal documents, or
- are ***NOT*** depicted adequately on submittal documents for verification, or
- are ***NOT*** located or identified on submittal documents in general congruence with WMS field and archival mapping information.

*New or additional mapping **IS REQUIRED** and must be re-submitted for further review and verification.**

_____ Presence of stream channels and/or drainageways is unknown ***AND*** field verification is not possible at this time. WMS will verify as soon as conditions and prioritized resources allow.

* ***Streams omitted in error by WMS or others remain subject to MOA Code and must be shown in new mapping upon identification of the error.***

ADDITIONAL INFORMATION:

☐Y ☒N	WMS written drainage recommendations are available.	☐Preliminary	☐Final
☐Y ☒N	WMS written field inspection report or map is available.	☐Preliminary	☐Final
☐Y ☒N	Field flagging and/or map-grade GPS data is available.		

Inspection Certified By: Kyle Cunningham

Date: 10/24/11

MUNICIPALITY OF ANCHORAGE

M E M O R A N D U M

DATE: March 2, 2012

TO: Jim Posey/Municipal Light and Power

FROM: Al Barrett, Division Manager, Current Planning Section

SUBJECT: **Notice of Zoning Action to be Recorded**

As a condition of your Zoning Conditional Use approval for Case 2012-004 it is the petitioner's responsibility to file the attached Notice of Zoning Action, prepared by the Planning Department, with the State District Recorder's Office and to **provide this office with proof of filing.**

Proof of filing may be in the form of a copy of your paid receipt, note information on the space provided below and fax to 343-7927 or return to the Municipality of Anchorage, P. O. Box 196650, Anchorage, Alaska, 99519-6650, or by calling this office at 343-7943 with the serial number and filing date.

The State of Alaska Recorder's Office is at 550 West 7th Avenue Suite 1200, located at the corner of 7th & "F" Street. Their open office hours are 8:00 a.m. to 3:30 p.m., Monday thru Friday. The phone number is 269-8899.

Please note that failure to file the Notice of Zoning Action and to provide proof of same to the Planning Department means the Zoning Conditional Use is not valid.

RECORDER'S OFFICE INFORMATION * COPY TO MUNICIPALITY OF ANCHORAGE *****

Serial Number 2012-012296-0 **Date** March 13, 2012

Receipt number if you have one._____

ALASKA

2012-012296-0

Recording Dist: 301 - Anchorage
3/9/2012 11:43 AM Pages: 1 of 5

NOTE
Send original recorded document to:
Municipality of Anchorage
Current Planning Section
Planning Division
PO Box 196650
Anchorage, AK 99519-6650

THIS COVER SHEET HAS BEEN ADDED TO THIS DOCUMENT TO PROVIDE SPACE FOR ANCHORAGE RECORDING DISTRICT DATA. THIS COVER SHEET APPEARS AS THE FIRST PAGE OF THE DOCUMENT IN THE OFFICIAL PUBLIC RECORD.

DO NOT DETACH

NOTICE OF ZONING ACTION

This notice announces that an zoning conditional use has been duly approved by the Planning and Zoning Commission of the Municipal Planning Department providing for the development of the herein described property in accordance with the provisions of the Anchorage Municipal Code of Ordinances and the terms and conditions of the zoning conditional use approval as set forth in the Municipal zoning file 2012-004 Under the provisions of the specified ordinance the subsequent development of the subject property shall be in accordance with the terms of the approved zoning conditional use or any subsequent amendments hereto.

LEGAL:	T13N, R2W, Section 7, Lot 8, S.M., Anchorage Recording District, Anchorage, Alaska. Approximately located at 8670 Glenn Highway.
PETITIONER:	Municipal Light and Power
REQUEST:	Zoning Conditional Use for a power station
ATTACHMENT:	**Copy** of the Municipality of Anchorage, Planning and Zoning Commission Resolution No. 2012-002.

A Barrett

for Director
Municipality of Anchorage
Community Development Department

STATE OF ALASKA)
)
THIRD JUDICIAL DISTRICT)

THIS IS TO CERTIFY that on the 2nd day of March, 2012 before me, the undersigned, a Notary Public in and for Alaska, personally appeared Al Barrett, to me known to be the duly appointed representative of the Director of the Community Development Department and acknowledged to me that he had in his official capacity aforesaid executed the forgoing instrument as an act and deed of the Municipality of Anchorage for the uses and purposes therein stated.

WITNESS my hand and notarial seal on the 2nd day of March, 2012 in this certificate first above written.

IRMA M. COX NOTARY PUBLIC STATE OF ALASKA My Commission Expires With Office

Irma M. Cox

Notary Public in and for Alaska
My Commission expires: 9/24/14

MUNICIPALITY OF ANCHORAGE
PLANNING AND ZONING COMMISSION RESOLUTION NO. 2012-002

A RESOLUTION APPROVING A FINAL CONDITIONAL USE TO ALLOW A UTILITY FACILITY (AN ELECTRICAL POWER GENERATION PLANT) IN THE PLI ZONE (PUBLIC LANDS AND INSTITUTIONS), LOT 8, SECTION 7, T13N, R2W, APPROXIMATELY LOCATED AT 8670 GLENN HIGHWAY.

(Case 2012-004, Property ID 074-061-02)

WHEREAS, a request has been received from Municipal Light & Power (MLP) for a conditional use to allow expansion of an electrical power generation plant, reviewed under the general conditional use standards of AMC 21.50.020, in the PLI district, located at 8670 Glenn Highway, and

WHEREAS, the expansion is needed to modernize equipment and to handle future demand, the existing power plant has been in operation since 1975, and the site is currently used by MLP and Anchorage Water and Wastewater Utility (AWWU), and

WHEREAS, the existing power plant has a conditional use, but an expansion of this size requires a new conditional use, and

WHEREAS, the Planning and Zoning Commission held a public hearing on this item January 9, 2012 and approved the application by a vote of 6 – aye, 0 – nay.

NOW, THEREFORE, BE IT RESOLVED, by the Municipal Planning and Zoning Commission that:

A. The Commission makes the following findings of fact:

1. The proposal is consistent with the comprehensive plan and addresses policies 1, 7, 27, 39, 40, 43, 44, 49, 50, and 80.

2. The proposed use meets or exceeds the development standards required under the PLI zoning district, AMC 21.40.020; Highway screening, AMC 21.45.130; and conditional uses, AMC 21.50.020.

3. The proposed use is compatible with existing and planned uses in the surrounding neighborhood, and with the intent of the district. Power plants are allowed by conditional use in the PLI, and the area is already in use by an existing power plant and a water reclamation facility. Park and residential areas are buffered by extensive areas of existing, mature vegetation which are outside of the area to be developed.

B. The Commission approves a final conditional use permit to allow the new electrical power plant construction, reviewed under the general conditional use standards of AMC 21.50.020 in the PLI zone, to be located at 8670 Glenn Highway, essentially as discussed in the application, narrative, site plans, and testimony, subject to:

1. All construction shall substantially conform to the following plans on file with the Planning Department:

   a. MLP plant 2 generation replacement project, figures 2.1, 2.2, 3, 4, 5, 6, 7.1 through 7.5, conditional use, dated: 11/8/2011; Scale: 1" = 60'; Sheet 1 of 2; Drawn by: CRW Engineers.

   b. The proposed development schedule is:

   March - April 2012 – clearing and grubbing (avoids USFW bird nesting window).

   May/June – November 2012 additional site prep and grading, including removal of the 45 foot hill.

   Final grading and construction 2013 – 2015.

2. Landscaping plans, including highway screening, shall be submitted to the Urban Design Commission for review and approval prior to building permit application.

3. A lighting plan shall be submitted to the Planning Department for review and approval prior to certificate of occupancy. The plan shall include fixture locations, photometric plan, and lighting fixture schedule. Exterior lighting shall be designed to meet standards for lighting zone 3 as shown in the IES model lighting ordinance. External lighting fixtures shall meet BUG ratings for lighting zone 2 and lighting levels at the property line shall not exceed 0.3 vertical foot candles. (Specifics are in section 3 of the staff report, comments submitted by Long Range Planning)

4. Review with Department of Health and Human Services the need for a dust control/air quality plan.

PASSED AND APPROVED by the Municipal Planning and Zoning Commission on the 9th day of January 2012.

ADOPTED by the Anchorage Municipal Planning and Zoning Commission this 6th day of February, 2012. This written decision/resolution of the Planning and Zoning Commission is final and any party may appeal it within twenty (20) days to the Board of Adjustment pursuant to Anchorage Municipal Code 21.30.030.

Jerry T. Weaver, Jr.
Secretary

Connie Yoshimura,
Chair

(Case Number 2012-004)
ab

CRW ENGINEERING GROUP, LLC
3940 Arctic Blvd. Ste. 300 Anchorage AK 99503
p (907)562-3252 | f (907)561-2273
www.crweng.com

June 4, 2012

Jerry Weaver, Director
Municipality of Anchorage
Community Development Department
P.O. Box 196650
Anchorage, Alaska 99519-6650

RE: Municipal Light & Power (ML&P) Conditional Use Approval - 2012-002

Dear Mr. Weaver:

The upgrade and expansion of the existing ML&P Power Plant 2, located at 8670 Glenn Highway, was approved as a Conditional Use on January 9, 2012 (Resolution 2012-002/Property ID 074-061-02) subject to the following conditions summarized below:

- *All construction should substantially conform to the plans on file;*
- *Landscaping plans, including highway screening, shall be submitted to the Urban Design Commission prior to the building permit application;*
- *A lighting plan shall be submitted to the Planning Department for review and approval prior to certificate of occupancy;*
- *Review need for dust control/air quality control plan.*

In accordance with the approved Conditional Use, clearing and grubbing occurred in April 2012 and site preparation is currently underway. Work is in compliance with an approved Stormwater Pollution Prevention Plan (SWPPP) which includes dust control measures. The highway landscaping plan is scheduled for review at the Urban Design Commission on June 13, 2102. The lighting plan will be submitted prior to the certificate of occupancy.

During the continued refinement the site design, ML&P identified the need for a laydown/staging yard to south of the new power plant expansion (see attached figure). This plan was reviewed with Al Barrett, MOA Planning Supervisor, and he indicated that the use is consistent with, and substantially conforms to, the approved Conditional Use for the following reasons:

- *The use an accessory use to the overall ML&P facility.*
- *It is consistent with ML&P's primary goal which is to ensure an adequate, safe, and reliable electricity supply at the lowest cost possible in keeping with sound utility practice.*
- *Access to the laydown/storage yard will be secured and will not increase traffic volumes or number of employees. Having on-site storage will result in more efficient operations.*
- *The overall project is still consistent with the comprehensive plan and addresses policies 1, 7, 27, 39, 40, 43, 44, 49, 50, and 80. By infilling the site land use is efficiently used and designed for long-term use.*
- *The overall project use meets or exceeds the PLI zoning district standards (AMC 21.40.020)and conditional uses standards (AMC 21.50.020) The addition of the laydown/storage yard does not impact the Highway Screening standard (AMC 21.45.130).*
- *The proposed use is compatible with existing and planned uses in the surrounding neighborhood and the intent of the district. The area is still within the ML&P property boundaries and bordered to the south by the AWWU Ship Creek Treatment Facility. Residential uses to the north are still buffered by extensive areas of existing, mature vegetation.*

CRW ENGINEERING GROUP, LLC
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p (907)562-3252 | f (907)561-2273
www.crweng.com

Mr. Barrett requested that ML&P submit a letter and site plan to document the minor modification to the approved Conditional Use for administrative concurrence from the Planning Department. I understand that Mr. Barrett is no longer at the MOA and would like ensure that this matter can still be handled administratively. A Fill, Grading, and Excavation permit will be obtained from the MOA Building Safety Department prior to beginning construction. Construction of the laydown/storage yard is expected to occur this summer.

Thank you for your assistance and I look forward to hearing from you.

Wende Wilber, AICP PTP

Approved
6-6-13

SUPPORTING INFORMATION

Army License- Access Road Use 1971 to 1976

MOA Wetlands Map

FEMA Floodplain Map

DEPARTMENT OF THE ARMY

LICENSE

No. DACA85-3-72-25

THE SECRETARY OF THE ARMY hereby grants to the City of Anchorage, Alaska, a municipal corporation

a license, for a period of five (5) years *commencing on* 12 October 1971 and ending 11 October 1976 *but revocable at the will of the Secretary of the Army, to* use land for an access road in connection with water filtration plant operations

as shown in red on Exhibit "A" *, attached hereto and made a part hereof, and described as follows:* A 200-foot right-of-way lying 100 feet either side of the following described centerline:

From the U.S.E.D. Monument L-23 (N. 107,398.01, E. 127,397.39), thence S. 47°26'46" E., a distance of 324.23 feet to the point of beginning (N. 107,178.74, E. 127,636.23) which is a point on the east boundary of Tract A located 1761.74 feet and N. 0°01'38" W. from the SE corner of Tract A; thence S. 74°30'10" E., a distance of 487.70 feet to a corner (N. 107,048.44, E. 128,106.20); thence S. 43°01'45" W., a distance of 561.30 feet to a corner (N. 106,638.13, E. 127,723.19); thence S. 33°38'20" W., a distance of 156.38 feet to a point on the east boundary of Tract A (N. 106,507.93, E. 127,636.56) located 1090.93 feet and N. 0°01'38" W. from the SE corner of Tract A. Containing 5.53 acres more or less

THIS LICENSE is granted subject to the following conditions:

~~*1. That the licensee shall pay to the United States compensation in the amount of:*~~

~~*Payments shall be forwarded directly to*~~

2. That the exercise of the privileges hereby granted shall be without cost or expense to the United States, under the general supervision and subject to the approval of the officer having immediate jurisdiction over the property, hereinafter referred to as "said officer," and subject also to such regulations as may be prescribed by him from time to time.

3. That any property of the United States damaged or destroyed by the licensee incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the licensee to the satisfaction of the said officer, or in lieu of such repair or replacement the licensee shall, if so required by the said officer, pay to the United States money in an amount sufficient to compensate for the loss sustained by the United States by reason of damage to or destruction of Government property.

4. That the United States shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the exercise of the privileges herein granted, or for damages to the property of the licensee, or for injuries to the person of the licensee, or for damages to the property or injuries to the person of the licensee's officers, agents, servants, or employees or others who may be on said premises at their invitation or the invitation of any one of them, arising from governmental activities on the said premises, and the licensee shall hold the United States harmless from any and all such claims.

5. That, on or before the date of expiration of this license or its relinquishment by the licensee, the licensee shall vacate the said Government premises, remove all property of the licensee therefrom, and restore the premises to a condition satisfactory to the said officer, damages by and [illegible] control of the licensee and due to fair wear and tear excepted. If, however, this license is revoked, the licensee shall vacate the premises, remove said property therefrom, and restore the premises as aforesaid within such time as the Secretary of the Army may designate. In either event, if the licensee shall fail or neglect to remove said property and so restore the premises, then, at the option of the Secretary of the Army, said property shall either become the property of the United States without compensation therefor, or the Secretary of the Army may cause the property to be removed and the premises to be so restored at the expense of the licensee, and no claim for damages against the United States or its officers or agents shall be created by or made on account of such removal and restoration work.

6. That the licensee shall pay the cost, as determined by the said officer, of producing and/or supplying any utilities and other services furnished by the Government or through Government-owned facilities for the use of the licensee, including the licensee's proportionate share of the cost of operation and maintenance of the Government-owned facilities by which such utilities or services are produced or supplied. The Government shall be under no obligation to furnish utilities or services. Payment shall be made in the manner prescribed by the said officer upon bills rendered monthly.

7. That the United States shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the construction, maintenance, and use of the facilities constructed by the licensee on the said premises.

8. That this license may be terminated by the licensee at any time by giving to the Secretary of the Army, through the said officer, at least ten (10) days' notice in writing; provided that, in case of such termination, no refund by the United States of any rental theretofore paid shall be made.

9. That it is to be understood that this license is effective only insofar as the rights of the United States in the property involved are concerned, and that the licensee shall obtain such permission as may be necessary on account of any other existing rights.

10. Access over the Oilwell Road will be granted only on a joint use basis with the Army.

11. Any damage done by the City to the road will be repaired at its expense.

12. Conditions No. 10 and 11 were added prior to the execution of this instrument and Condition No. 1 was deleted.

~~10. That Condition(s) No.(s) _____ was (were) deleted prior to the execution of this License.~~

This License is not subject to Title 10, United States Code, Section 2662.

IN WITNESS WHEREOF, I have hereunto set my hand by authority of the Secretary of the Army

this 13th *day of* October *19* 71.

FOR THE DISTRICT ENGINEER:

MORGAN WHEELER
Chief, Real Estate Division
Alaska District, Corps of Engineers
Authorized Representative

The above instrument, together with all the conditions thereof, is hereby accepted this 7th *day of* October *19* 71

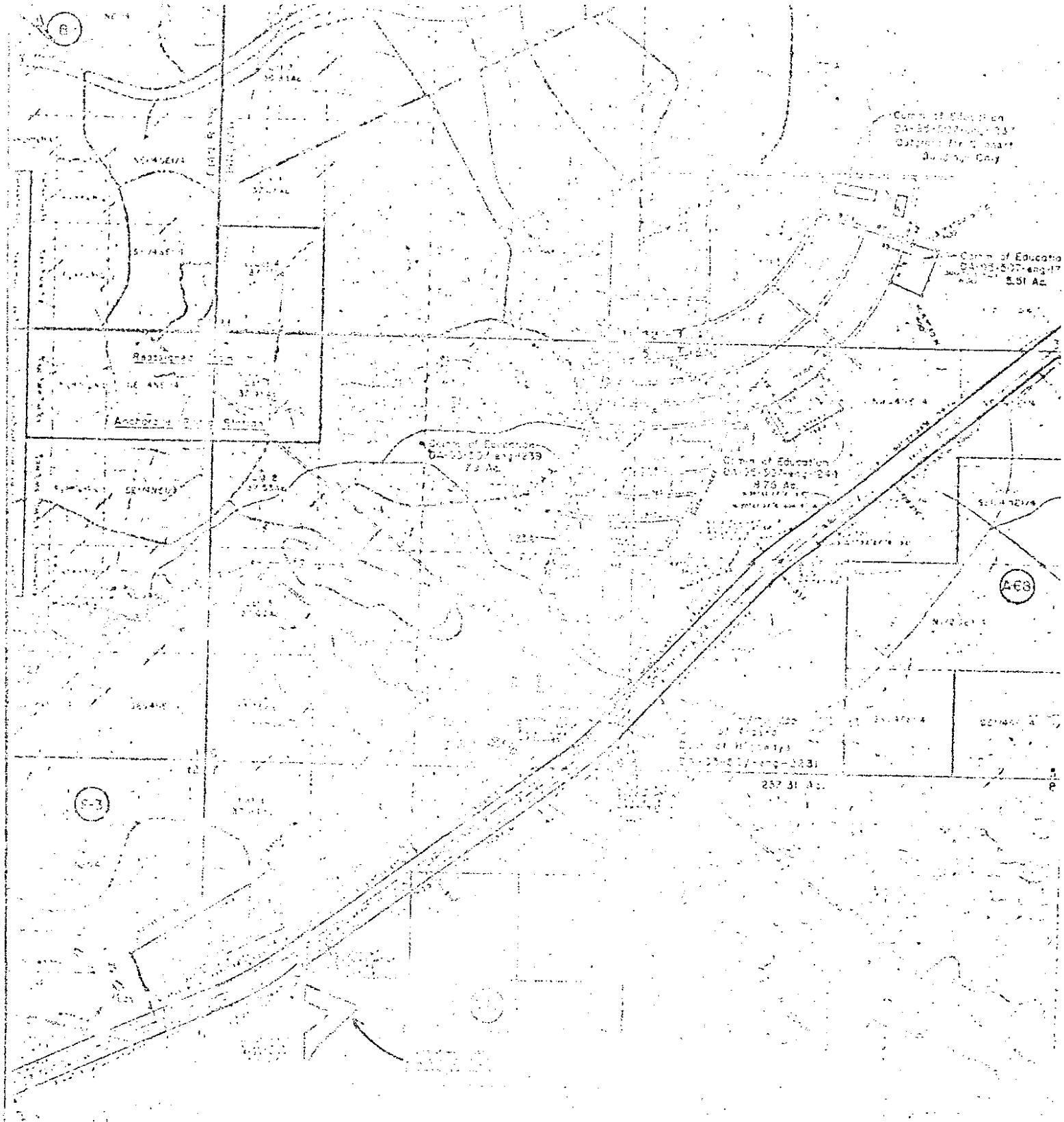
CITY OF ANCHORAGE:

ATTEST: _____
City Clerk

APPROVED AS TO FORM: _____
City Attorney

BY: _____

TITLE: _____



NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' Mean Sea Level (MSL) Tidal Datum. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 6. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the Mean Sea Level tidal datum. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map digital files provided by Municipality of Anchorage DPW and AK DNR. Information compiled at scales of 1:1200 to 1:24000 during 2000-06. Streams and lake shorelines associated with FHAs digitized from Army Corp. of Engineers flood hazard workmaps from MOA DPW.

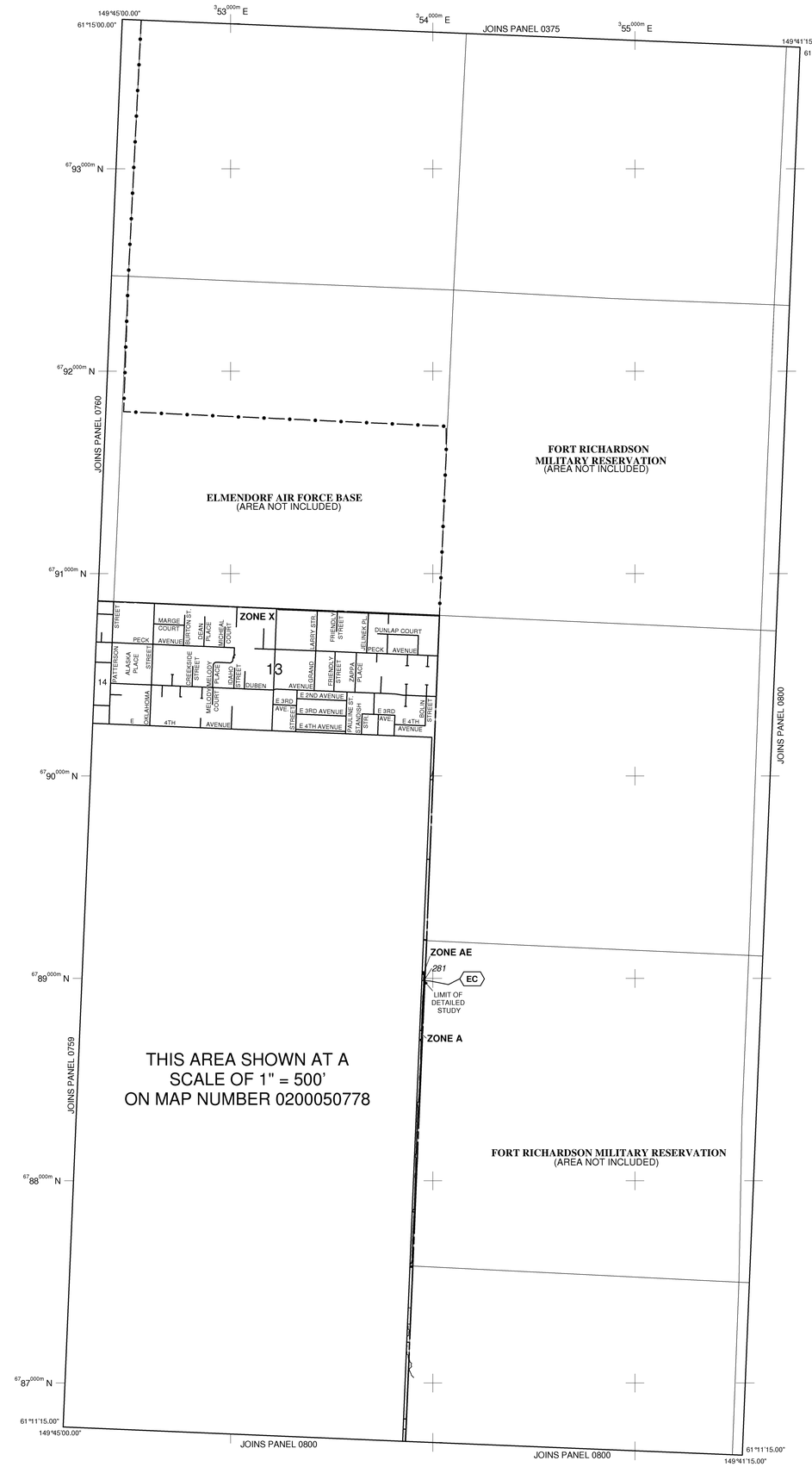
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map showing the layout of map panels for this jurisdiction.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the Mean Sea Level (MSL) Tidal Datum

A — A	Cross section line
23 — 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN	1000-meter Universal Transverse Mercator grid ticks, zone 6
6000000 M	5000-foot grid ticks: New York State Plane coordinate system, east zone (FIPSZONE 3101), Transverse Mercator
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

MAP REPOSITORY
4700 South Bragaw Street, Anchorage, Alaska 99507 (Maps available for reference only, not for distribution.)

INITIAL NFIP MAP DATE
September 5, 1979
FLOOD HAZARD BOUNDARY MAP REVISIONS

FLOOD INSURANCE RATE MAP EFFECTIVE
September 5, 1979
FLOOD INSURANCE RATE MAP REVISIONS
September 18, 1978 –to update map format.
March 5, 1990 – to change Base Flood Elevations and Special Flood Hazard Areas, reflect updated topographic information and to incorporate previously issued Letters of Map Revision.
July 2, 2002 –to add Special Flood Hazard Areas and Base Flood Elevations.
September 25, 2009 –to update corporate limits, change zone designations and to incorporate previously issued Letters of Map Revision.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0780D

FIRM
FLOOD INSURANCE RATE MAP

MUNICIPALITY OF
ANCHORAGE, ALASKA
ANCHORAGE DIVISION COUNTY

PANEL 780 OF 1975
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

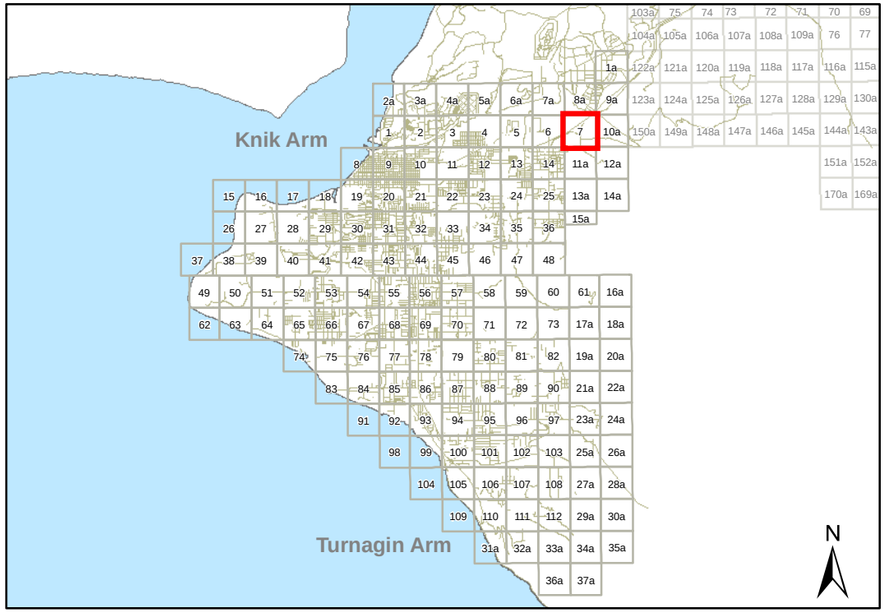
COMMUNITY	NUMBER	PANEL	SUFFIX
ANCHORAGE, MUNICIPALITY OF	020005	0780	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
0200050780D

MAP REVISED
SEPTEMBER 25, 2009

Federal Emergency Management Agency



Legend

- Wetlands Designation (B / 62 — 96 AWMP ID)
- A Wetlands
- B Wetlands
- C Wetlands
- D - Not Designated
- P - Potential Wetland
- Lakes
- Streams
- Stormdrain Pipes
- Open Channels
- Natural Channels
- Piped Streams
- MOA Grid
- Lot (24) / Block
- Subdivision
- Clean Out
- Weir
- OGS
- Catch Basin MH
- Catch Basin
- Manhole

500 250 0 500
Feet

Notes

1. Information contained on these mapsheets is representative and maps may be incomplete or contain local error. Confirm data for project specific applicatons.
2. Map Plates numbered to match 1996 Wetlands Management Plan.
   Map Plates suffixed by 'a' not mapped in 1996 Wetlands Management Plan.

Last Updated 02/20/08

Watershed Managment Services

MOA Wetlands Atlas

Vol. 1: Anchorage

Anchorage Wetlands Map #7

T13N R02W S07

Compiled by GeoNorth, LLC