



May 11, 2016
Cardno 031227CXAT.L13

Mr. Aaron Thom
ExxonMobil Environmental Services Company
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Cardno

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SUBJECT Operations and Maintenance Memo – 1st Quarter 2016
Former Exxon Fueling Facilities
Grant County International Airport
7810 Andrews Street Northeast
Moses Lake, Washington

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Mr. Thom:

At the request of ExxonMobil Environmental Services Company (EMES), on behalf of Exxon Mobil Corporation, Cardno has operated and maintained a NAPL recovery system at the Former Exxon Fueling Facilities, located at the Grant County International Airport, in Moses Lake, Washington.

SITE DESCRIPTION

Grant County International Airport (Airport) is located immediately north of the City of Moses Lake in Grant County, Washington (Plate 1). The site lies at an elevation of approximately 1,170 feet above msl. Former ExxonMobil-leased facilities include fueling hydrants located in the southern portion of the Airport, two aboveground storage tanks (Storage Tanks #38 and #24, with capacities of 54,390 barrels (bbl) and 27,426 bbl, respectively) located south of the Airport, and associated product piping runs; all of which have historically been used to dispense jet fuel. A generalized site plan for Pumphouse #1 is shown on Plate 2.

OPERATIONS AND MAINTENANCE SUMMARY

- Performed one site visit during the 1st quarter 2016 on March 1, 2016.
- Operating on monitoring wells MW15, MW21, MW22, MW25, and MW26.
- NAPL thickness was measured at thicknesses ranging from 0.85 to 1.91 feet.
- The measured DTW ranged from 87.21 to 91.37 feet bgs.
- Approximately 80.9 gallons of NAPL was recovered in 1st quarter 2016 from December 2, 2015 through March 1, 2016.
- A total of approximately 108.7 gallons of NAPL recovered through March 1, 2016.

LIMITATIONS

For any documents cited that were not generated by Cardno, the data taken from those documents is used "as is" and is assumed to be accurate. Cardno does not guarantee the accuracy of this data and makes no warranties for the referenced work performed nor the inferences or conclusions stated in these documents. This report and the works performed have been undertaken in good faith, with due diligence and with the expertise, experience capability and specialized knowledge necessary to perform the Work in a good and workmanlike manner and within all accepted standards pertaining to providers of environmental services, in Washington at the time of investigation. No soil engineering or geotechnical references are implied or should be inferred. The evaluation of the geologic

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conditions at the site for this investigation is made from a limited number of data points. Subsurface conditions may vary away from these data points.

Cardno appreciated the opportunity to provide assistance on this project. Please contact Michael Miller, Cardno Project Manager for this site, at 206 767 2360, with any questions.

Sincerely,



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ENCLOSURES

Plate 1 Site Location Map
Plate 2 Generalized Site Plan (Pumphouse #1)
Plate 3 Remediation System Trenching Map (Pumphouse #1)

Table 1 Operations and Maintenance Summary

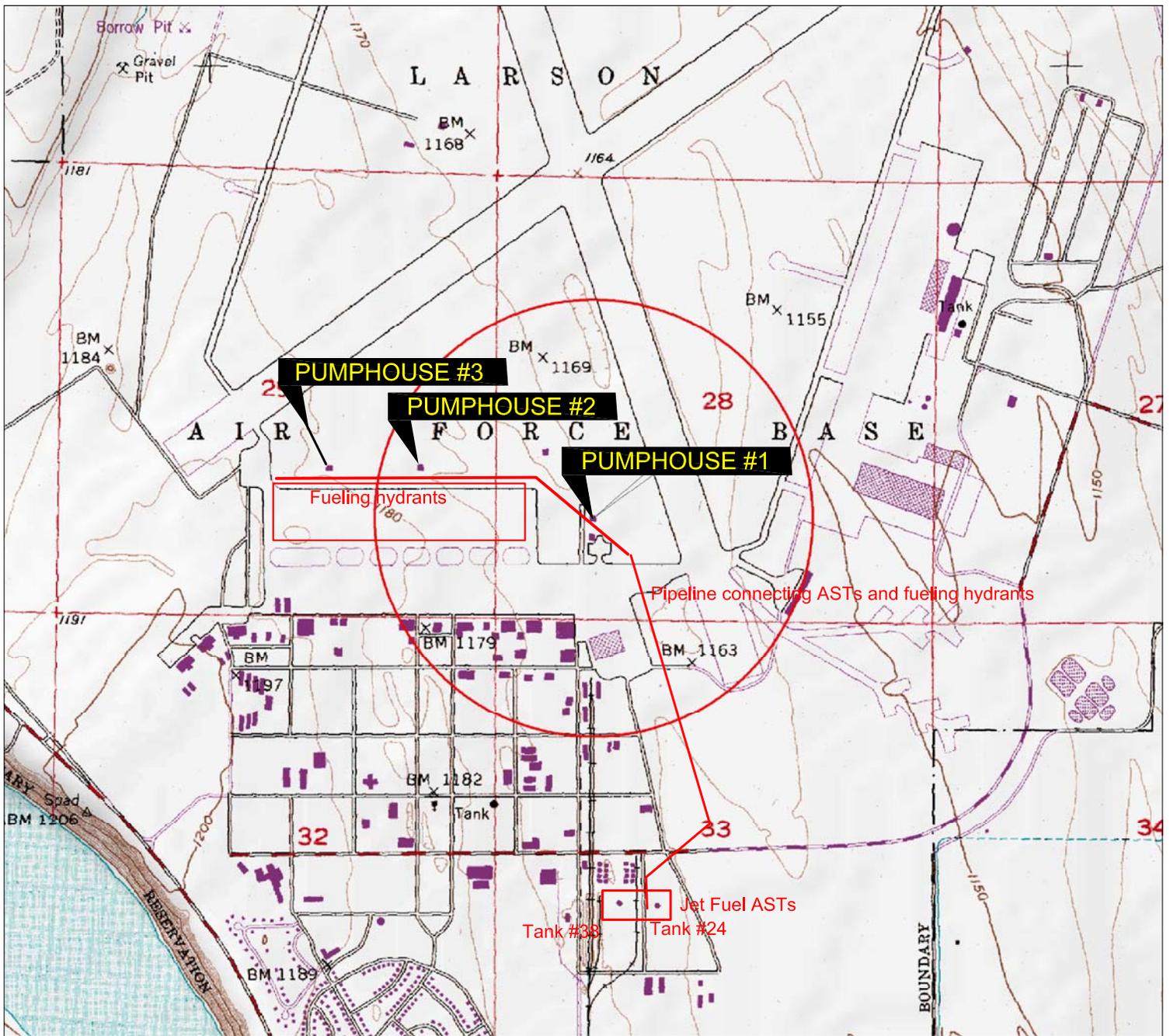
cc: w/ enclosures
 LUST coordinator, Washington State Department of Ecology
 Mr. Larry Godden, Air America Fuel and Service, Inc. (*electronic Copy*)
 Mr. Craig L. Baldwin, Grant County International Airport (*electronic copy*)

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ACRONYM LIST

µg/L	Micrograms per liter	NAPL	Non-aqueous phase liquid
µs	Microsiemens	NEPA	National Environmental Policy Act
1,2-DCA	1,2-dichloroethane	NGVD	National Geodetic Vertical Datum
acfm	Actual cubic feet per minute	NPDES	National Pollutant Discharge Elimination System
AS	Air sparge	O&M	Operations and Maintenance
bgs	Below ground surface	ORP	Oxidation-reduction potential
BTEX	Benzene, toluene, ethylbenzene, and total xylenes	OSHA	Occupational Safety and Health Administration
CEQA	California Environmental Quality Act	OVA	Organic vapor analyzer
cfm	Cubic feet per minute	P&ID	Process & Instrumentation Diagram
COC	Chain of Custody	PAH	Polycyclic aromatic hydrocarbon
CPT	Cone Penetration (Penetrometer) Test	PCB	Polychlorinated biphenyl
DIPE	Di-isopropyl ether	PCE	Tetrachloroethene or perchloroethylene
DO	Dissolved oxygen	PID	Photo-ionization detector
DOT	Department of Transportation	PLC	Programmable logic control
DPE	Dual-phase extraction	POTW	Publicly owned treatment works
DTW	Depth to water	ppmv	Parts per million by volume
EDB	1,2-dibromoethane	PQL	Practical quantitation limit
EDC	1,2-dichloroethane	psi	Pounds per square inch
EPA	Environmental Protection Agency	PVC	Polyvinyl chloride
ESL	Environmental screening level	QA/QC	Quality assurance/quality control
ETBE	Ethyl tertiary butyl ether	RBSL	Risk-based screening levels
FID	Flame-ionization detector	RCRA	Resource Conservation and Recovery Act
fpm	Feet per minute	RL	Reporting limit
GAC	Granular activated carbon	scfm	Standard cubic feet per minute
gpd	Gallons per day	SSTL	Site-specific target level
gpm	Gallons per minute	STLC	Soluble threshold limit concentration
GWPTS	Groundwater pump and treat system	SVE	Soil vapor extraction
HVOC	Halogenated volatile organic compound	SVOC	Semivolatile organic compound
J	Estimated value between MDL and PQL (RL)	TAME	Tertiary amyl methyl ether
LEL	Lower explosive limit	TBA	Tertiary butyl alcohol
LPC	Liquid-phase carbon	TCE	Trichloroethene
LRP	Liquid-ring pump	TOC	Top of well casing elevation; datum is msl
LUFT	Leaking underground fuel tank	TOG	Total oil and grease
LUST	Leaking underground storage tank	TPHd	Total hydrocarbons as diesel
MCL	Maximum contaminant level	TPHg	Total hydrocarbons as gasoline
MDL	Method detection limit	TPHmo	Total hydrocarbons as motor oil
mg/kg	Milligrams per kilogram	TPHs	Total hydrocarbons as stoddard solvent
mg/L	Milligrams per liter	TRPH	Total recoverable hydrocarbons
mg/m ³	Milligrams per cubic meter	UCL	Upper confidence level
MPE	Multi-phase extraction	USCS	Unified Soil Classification System
MRL	Method reporting limit	USGS	United States Geologic Survey
msl	Mean sea level	UST	Underground storage tank
MTBE	Methyl tertiary butyl ether	VCP	Voluntary Cleanup Program
MTCA	Model Toxics Control Act	VOC	Volatile organic compound
NAI	Natural attenuation indicators	VPC	Vapor-phase carbon



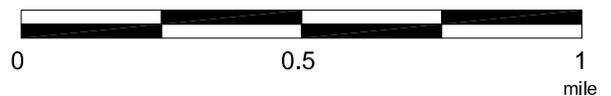
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EXPLANATION

○ 1/2-mile Radius Circle From Pumphouse #1

APPROXIMATE SCALE



SOURCE:
 Modified from a map
 provided by
 DeLorme 3-D TopoQuads



SITE LOCATION MAP

GRANT COUNTY AIRPORT
 FORMER FUELING FACILITIES
 7810 Andrews Street Northeast
 Moses Lake, Washington

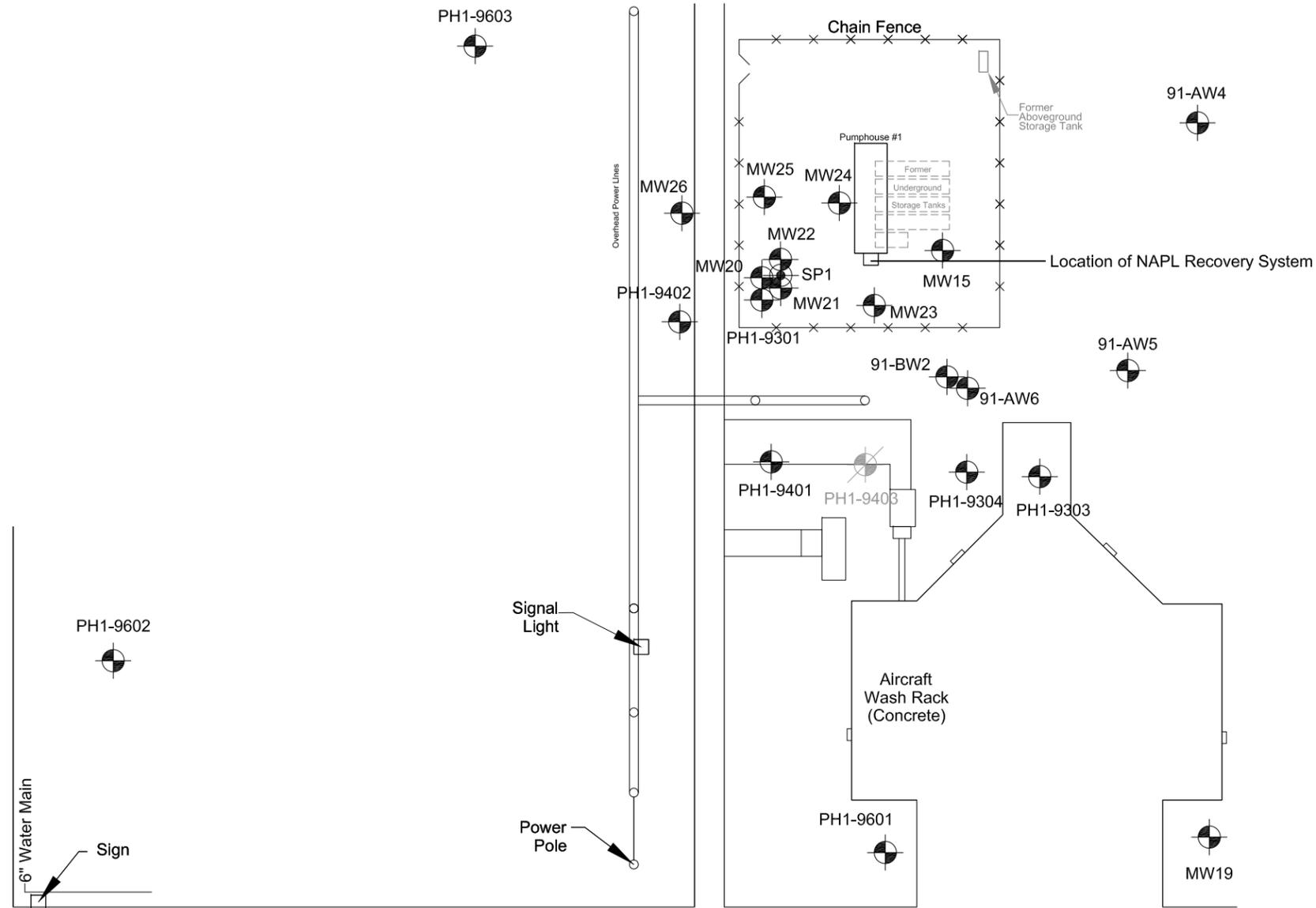
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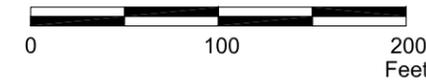
PLATE

1

NAG: 01/12/12



APPROXIMATE SCALE



SOURCE:
Modified from a map provided by
Secor International Inc.

FN 0312270002

**GENERALIZED SITE PLAN
(PUMPHOUSE #1)**
GRANT COUNTY AIRPORT
FORMER FUELING FACILITIES
7810 Andrews Street Northeast
Moses Lake, Washington

EXPLANATION

- PH1-9603 Groundwater Monitoring Well
- PH1-9403 Destroyed Groundwater Monitoring Well

PROJECT NO.

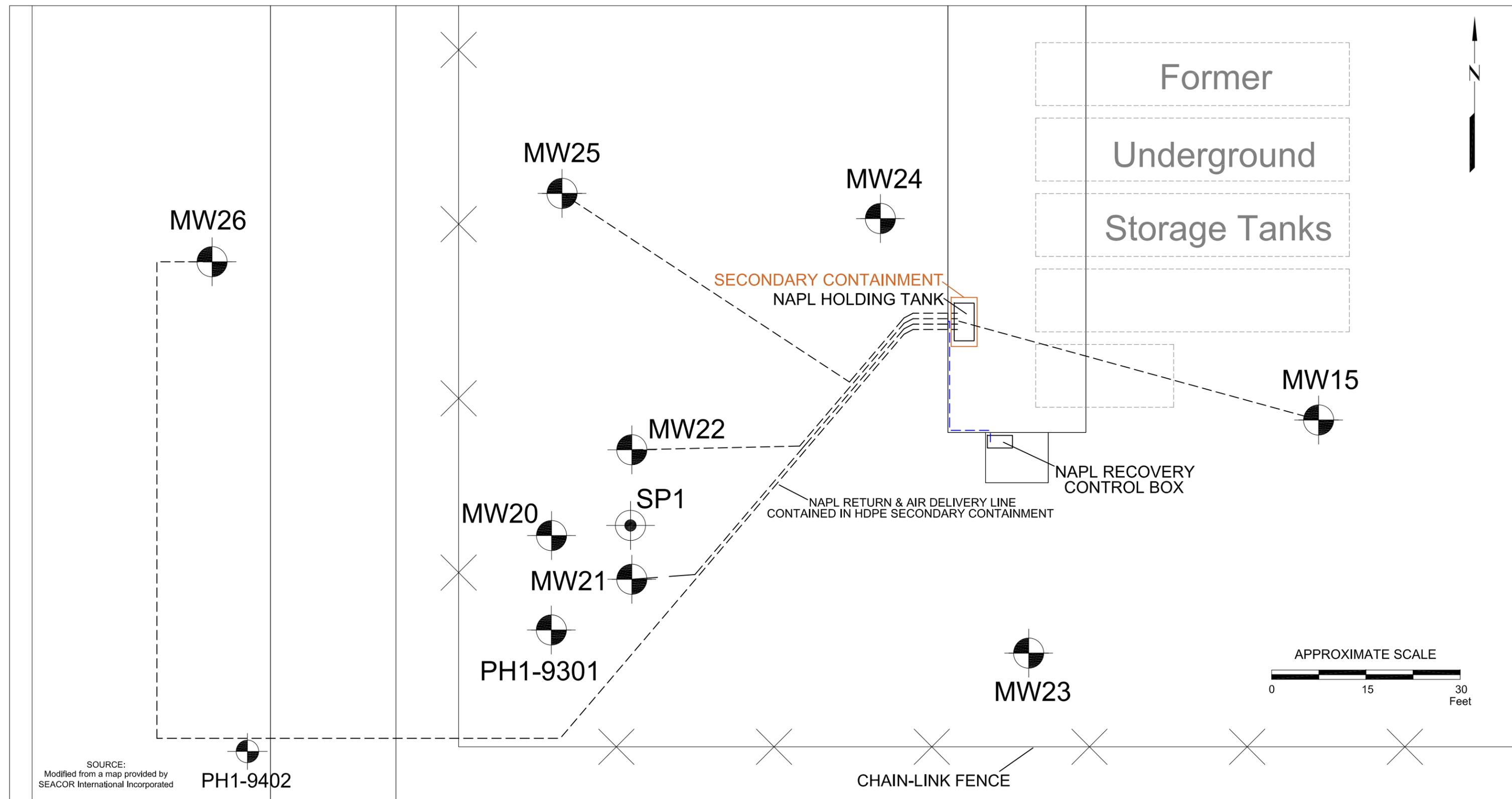
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PLATE

2

EJB: 07/01/13





SOURCE:
Modified from a map provided by
SEACOR International Incorporated

PH1-9402

FN 0312270002



**REMEDIATION SYSTEM
TRENCHING MAP (PUMPHOUSE #1)**
GRANT COUNTY AIRPORT
FORMER FUELING FACILITIES
7810 Andrews Street Northeast
Moses Lake, Washington

- EXPLANATION**
- PH1-9402
 - Groundwater Monitoring Well
 - Steam Injection Well
 - Remediation System Air Supply
 - Remediation System Air Supply and NAPL Return Piping

PROJECT NO.
031227

PLATE
3

RRT: 11/02/15

**TABLE 1
OPERATIONS AND MAINTENANCE SUMMARY**

Grant County Airport
Former Fueling Facilities
7810 Andrews Street Northeast
Moses Lake, Washington
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Date	NAPL Recovery		Well	DTNAPL (feet bgs)	DTW (feet bgs)	NAPL Thickness (feet)	Adjustement to System			Total Pumping Time (hours)	Comments
	Holding Tank (inches)	Total ^a (gallons)					Pump Depth (feet bgs)	Pumping Duration (min)	Days Between Pumping (day)		
12/02/15	3.5	27.8	MW15	87.90	88.73	0.83	88.32	3	1	1.13	Initial pump depth - 88.62 feet bgs. Initial pumping rate - 3 minutes every 2 days. Pump down on arrival. Adjusted pumping air flow. Pump operational upon departure.
			MW21	91.16	93.31	2.15	92.24	4	1	1.77	Initial pump depth - 92.02 feet bgs. Initial pumping rate - 4 minutes every 2 days. Pump operational upon arrival/departure. Removed snow from exhaust valve.
			MW22	91.28	93.35	2.07	92.32	10	1	4.48	Initial pump depth - 92.01 feet bgs. Initial pumping rate - 10 minutes every 2 days. Pump operational upon arrival/departure. Removed snow from exhaust valve. Unwound NAPL float pulley.
			MW25	91.24	92.92	1.68	92.08	5	1	2.22	Initial pump depth - 91.25 feet bgs. Initial pumping rate - 5 minutes every 2 days. Pump operational upon arrival/departure.
			MW26	90.79	92.02	1.23	91.41	6	1	2.47	Initial pump depth - 91.70 feet bgs. Initial pumping rate - 6 minutes every 2 days. Pump operational upon arrival/departure. Noticed crimping in the exhaust and supply line from the former position of the compression fitting.
03/01/16	13.5	108.7	MW15	87.19	87.22	0.03	87.21	0	0	5.65	Pump operational upon arrival. Pump was shut down on 03/01/16 due to minimal NAPL thickness.
			MW21	90.39	92.30	1.91	91.35	4	1	7.70	Pump operational upon arrival/departure. Removed snow from exhaust valve.
			MW22	90.57	92.17	1.60	91.37	10	1	19.32	Pump operational upon arrival/departure. Cleaned float pulley.
			MW25	90.62	91.47	0.85	91.05	3	1	9.65	Pump operational upon arrival/departure. Cleaned float pulley.
			MW26	90.21	91.20	0.99	90.71	4	1	11.40	Pump was down upon arrival. Adjusted pumping air flow. Pump operational upon departure.

Continued on Page 2

**TABLE 1
OPERATIONS AND MAINTENANCE SUMMARY**

Grant County Airport
Former Fueling Facilities
7810 Andrews Street Northeast
Moses Lake, Washington
Page 2 of 2

Date	NAPL Recovery		Well	DTNAPL (feet bgs)	DTW (feet bgs)	NAPL Thickness (feet)	Adjustement to System			Total Pumping Time (hours)	Comments
	Holding Tank (inches)	Total ^a (gallons)					Pump Depth (feet bgs)	Pumping Duration (min)	Days Between Pumping (day)		

EXPLANATION:

ZYTECH Pneumatic NAPL recovery system start on 10/09/15

DTNAPL = Depth to NAPL

DTW = Depth to water in feet below top of casing

NAPL = Non-aqueous phase liquid

feet bgs = feet below ground surface

NM = Not measured

a = Total volume calculated using know dimensions of holding tank and measured depth converted to gallons