November 5, 2015

Andy Smith
Department of Ecology
Southwest Regional Office
Toxics Cleanup Program
PO Box 47775
Olympia, Washington 98504-7775

Re: September 2015 Groundwater Monitoring Results
NuStar Vancouver Annex Terminal
Vancouver, Washington
1569-05

Dear Mr. Smith:

Apex Companies LLC. (Apex) has prepared this September 2015 Groundwater Monitoring Results letter for the NuStar Terminals Operations Partnership, L.P. (NuStar) Annex Terminal located at 5420 NW Fruit Valley Road, Vancouver, Washington (the Site; Figure 1). On July 29, 2014, the Washington State Department of Ecology (Ecology) submitted the Project Coordinator's Decision (the Decision) to NuStar, documenting steps for additional investigation and monitoring to support the Feasibility Study (FS) of the Site. One of the provisions of the Decision was that Site groundwater monitoring wells would be sampled for four quarters, with results being submitted to Ecology in quarterly letter reports. This fourth quarterly letter summarizes the results of the September 2015 groundwater monitoring event, and completes the additional sampling provisions

GROUNDWATER MONITORING

On September 15, 2015, Apex conducted groundwater monitoring of Site monitoring wells MW-1 through MW-6, including gauging depth to groundwater, and groundwater sampling and analysis; locations of the wells are shown on Figure 2. Measurements of the depth to groundwater were collected from the wells prior to groundwater sampling and were measured to the nearest 0.01 foot using an electronic probe. Prior to groundwater sampling, wells were purged with a peristaltic pump while water quality parameters (pH, temperature, and specific conductance) were recorded. Purging was considered complete when the field parameters stabilized. Following purging, groundwater samples were collected using a peristaltic pump and dedicated tubing. Field notes are included in Attachment A.

The groundwater samples were analyzed for gasoline-range total petroleum hydrocarbons (TPHg) and diesel-range total petroleum hydrocarbons (TPHd) with silica gel cleanup; benzene, toluene, ethylbenzene, and total xylenes (BTEX); and methyl tert-butyl ether (MTBE) by Pace Analytical of Davis, California. Laboratory reports and a quality assurance/quality control (QA/QC) review are included in Attachment B.

Groundwater Elevations

Depth to groundwater ranged from between 19.05 and 32.61 feet, corresponding to groundwater elevations ranging from 7.56 to 7.61 feet above mean sea level (MSL). Groundwater elevations were within historical levels that have ranged from between 7.47 feet and 11.94 feet above MSL (Table 1). Monitoring wells MW-5 and MW-6 have not been surveyed, so well elevation, and therefore groundwater elevation information, for these wells is not available. The groundwater gradient measured during the September 2015 monitoring event was consistent with historical

results and indicates a flat to slight gradient to the south or southeast (AMEC, 2002; SECOR, 2003; and Ash Creek, 2009, 2010). Groundwater isocontours are shown on Figure 3.

Analytical Results

Analytical results from the September 2015 groundwater monitoring event are summarized in Table 2 and on Figures 4 and 5.

TPHd were at or below detection limits in the groundwater samples from wells MW-1 and MW-4 and oil-range total petroleum hydrocarbons (TPHo) were at or below reporting limits in the groundwater samples from wells MW-1 through MW-6. The laboratory identified a few discreet peaks in the diesel hydrocarbon range in samples from wells MW-2, MW-5 and MW-6; however, the laboratory confirmed that the peaks were not typical of a diesel hydrocarbon fingerprint. The laboratory chemist noted that the peaks were indicative of non-petroleum organic material, which is typically (but not always) filtered out during silica gel cleanup. While silica gel cleanup was performed on the TPHd analysis, it was not effective in removing all organic material from the sample. TPHg was not detected in the groundwater samples from wells MW-1 through MW-4. TPHg in wells MW-5 and MW-6 were detected at concentrations of 17.3 milligrams per liter (mg/L) and 15.1 mg/L, respectively, which exceed the MTCA Method A cleanup level for TPHg of 0.800 mg/L.

BTEX results were below MTCA Method A cleanup levels, and typically below reporting limits, in the groundwater samples collected from wells MW-1 through MW-4. Benzene was detected at a concentration of 0.328 mg/L in the groundwater sample from MW-6, which exceeds the MTCA Method A cleanup level of 0.005 mg/L. Total xylenes in wells MW-5 and MW-6 were detected at a concentration of 1.92 mg/L, exceeding the MTCA Method A cleanup level of 1 mg/L; ethylbenzene, in well MW-6, exceeded the cleanup level of 0.7 mg/L, with a concentration of 1.3 mg/L.

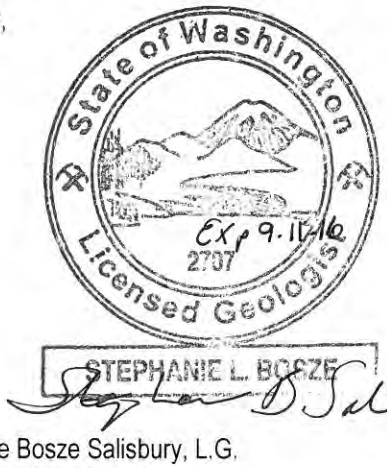
MTBE was not detected in groundwater samples from wells MW-1 through MW-6 at concentrations above the Model Toxics Control Act (MTCA) Method A cleanup level of 0.02 mg/L.

FUTURE WORK

The September 2015 monitoring event concludes the four consecutive groundwater monitoring events required by the Decision. The monitoring well data from the four groundwater monitoring events and grab groundwater data from the additional site investigations, including the forthcoming investigation in the vicinity of wells MW-5 and MW-6, will be used to support the preparation of a Revised FS. The upcoming groundwater investigation is scheduled for late October 2015 – it is our understanding that the results of the investigation may indicate a need for additional monitoring wells and/or additional groundwater monitoring. NuStar/Apex will work with Ecology to establish a schedule for future project work including submittal of a Revised FS to Ecology.

If you have any questions regarding the contents of this letter, please do not hesitate to call either of the undersigned at (503) 924-4704.

Sincerely,



Stephanie Bosze Salisbury, L.G.
Associate Geologist

Amanda Spencer
Principal Hydrogeologist

cc: Mr. Aaron Flett, NuStar Terminals Operations Partnership, L.P. (electronic deliverable)
Ms. Renee Robinson, NuStar Energy, L.P. (electronic deliverable)
Mr. Stephan Rosen, NuStar Energy, L.P. (electronic deliverable)

ATTACHMENTS

Table 1 – Groundwater Elevation Data
Table 2 – Analytical Results from Groundwater Monitoring Wells

Figure 1 – Site Location Map
Figure 2 – Site Plan
Figure 3 – Groundwater Elevations – September 2015
Figure 4 – September 2015, TPH Concentrations in Groundwater
Figure 5 – September 2015 BTEX and MTBE Concentrations in Groundwater

Attachment A – Field Notes
Attachment B – Laboratory Analytical Results and Quality Assurance/Quality Control Review

REFERENCES

AMEC, 2002a. *Phase II Environmental Site Assessment*, Cenex Harvest State Cooperatives. May 2002.

Apex Companies, LLC. (Apex), 2015. March 2015 Groundwater Monitoring Results and Groundwater Investigation Work Plan. Vancouver Annex Terminal, Vancouver, Washington, May 28, 2015.

Ash Creek Associates (Ash Creek), 2009. *Remedial Investigation Work Plan*. October 2009.

Ash Creek, 2010. *Remedial Investigation/Risk Assessment Report*. December 29, 2010.

SECOR, 2003. *Results of Phase II Environmental Site Assessment*. June 6, 2003.

Table 1
Groundwater Elevation Data
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Date of Measurement	Top of Casing Elevation (feet above MSL)[1]	Depth to Water (feet BTOC)	Groundwater Elevation (feet)
MW-1	05/14/02	NS	16.00	NS
	05/25/07	26.66	14.92	11.74
	08/24/07	26.66	18.67	7.99
	11/26/07	26.66	17.91	8.75
	02/27/08	26.66	16.92	9.74
	03/30/10	26.66	17.09	9.57
	09/01/10	26.66	19.19	7.47
	12/16/14	26.66	16.19	10.47
	03/25/15	26.66	15.25	11.41
	06/24/15	26.66	18.43	8.23
	09/15/15	26.66	19.05	7.61
MW-2	05/14/02	NS	27.46	NS
	05/25/07	38.21	26.46	11.75
	08/24/07	38.21	30.17	8.04
	11/26/07	38.21	29.42	8.79
	02/27/08	38.21	28.50	9.71
	03/30/10	38.21	28.66	9.55
	09/01/10	38.21	30.74	7.47
	12/16/14	38.21	27.77	10.44
	03/25/15	38.21	26.79	11.42
	06/24/15	38.21	30.05	8.16
	09/15/15	38.21	30.65	7.56
MW-3	05/14/02	NS	28.15	NS
	05/25/07	39.11	27.17	11.94
	08/24/07	39.11	31.04	8.07
	11/06/07	39.11	30.36	8.75
	02/27/08	39.11	28.71	10.40
	03/30/10	39.11	29.55	9.56
	09/01/10	39.11	31.65	7.46
	12/16/14	39.11	28.54	10.57
	03/25/15	39.11	27.72	11.39
	06/24/15	39.11	30.85	8.26
	09/15/15	39.11	31.52	7.59
MW-4	05/14/02	NS	29.40	NS
	05/25/07	40.17	28.35	11.82
	08/24/07	40.17	32.12	8.05
	11/06/07	40.17	31.40	8.77
	02/27/08	40.17	30.40	9.77
	03/30/10	40.17	30.77	9.40
	09/01/10	40.17	32.62	7.55
	12/16/14	40.17	29.63	10.54
	03/25/15	40.17	28.76	11.41
	06/24/15	40.17	31.92	8.25
	09/15/15	40.17	32.61	7.56
MW-5	12/16/14	NS	16.60	NS
	03/25/15	NS	15.37	NS
	06/24/15	NS	18.89	NS
	09/15/15	NS	19.35	NS
MW-6	12/16/14	NS	16.93	NS
	03/25/15	NS	15.73	NS
	06/24/15	NS	19.34	NS
	09/15/15	NS	19.70	NS

Notes:

1. Survey elevations determined by Statewide Land Surveying, October, 2007.
2. feet above MSL = feet above mean sea level.
3. feet BTOC = feet below top of casing.
4. NS = Not surveyed.

Table 2
Analytical Results from Groundwater Monitoring Wells
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Sample Date	Screened Interval (feet bgs)	Concentrations in mg/L (ppm)																					
			TPHg	TPHd	TPHho	Benzene	Toluene	Ethylbenzene	Xylenes	1,2-Dibromoethane	1,2-Dichloroethane	Ethanol	Tert-Butyl alcohol	Ethyl tert-Butyl Ether (ETBE)	Diisopropyl Ether (DIPE)	Methyl tert-butyl ether (MTBE)	Tert-Amyl Methyl Ether (TAME)	Naphthalene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Isopropyl-benzene	n-Propylbenzene	n-Butyl-benzene	sec-Butyl-benzene	Chloroform	Methanol
MW-1	05/14/02	14.5-24.5	<0.080	0.455 [5]	<0.500	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	--	--	--	--	<0.002	--	<0.002	<0.001	<0.0005	<0.002	<0.0005	--	--	--	--
	05/19/03		--	--	--	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001					<0.001		<0.002	<0.001	<0.001	<0.002	<0.001	<0.05	<0.001	<0.001	--
	05/25/07		<0.080	<0.238	<0.476	<0.0002	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	<0.150	<0.025	<0.001	<0.001	<0.002	<0.001	<0.002	<0.001	<0.0005	<0.002	<0.0005	--	--	--	--
	08/24/07		<0.1	<0.238	<0.476	<0.001	<0.002	<0.002	<0.006	<0.0005	<0.0005	<0.100	<0.020	<0.0005	<0.0005	<0.0005	<0.0005	<5.0	<0.001	<0.001	<0.002	<0.001	--	--	--	--
	11/26/07		<0.080	<0.236	<0.472	<0.001	<0.002	<0.002	<0.006	<0.0005	<0.0005	<0.100	<0.020	<0.0005	<0.0005	<0.0005	<0.0005	<5.0	<0.001	<0.001	<0.002	<0.001	--	--	--	--
	02/27/08		<0.080	<0.294	<0.588	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	<0.100	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	--	--	--
	03/31/10		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--
	09/01/10		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--
	12/16/14		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0005	--	--	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	--	--	--	--	--	--	--	--	<0.050
	03/25/15		<0.250	<0.046	<0.093	<0.0005	<0.0005	<0.0005	<0.001	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
	06/24/15		<0.250	<0.100	<0.250	<0.0005	<0.0005	<0.0005	<0.001	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
	09/15/15		<0.250	<0.130	<0.340	<0.0005	<0.0005	0.0015	0.0022	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
MW-2	05/14/02	20-35	41.4	<0.250	<0.500	4.35	2.68	1.84	8.72	<0.025	<0.025	--	--	--	--	0.7	--	0.106	0.665	0.194	<100	0.071	--	--	--	--
	05/19/03		--	--	--	0.534	0.00975	0.194	0.876	<0.05	<0.05	--	--	--	--	0.0776	--	0.015	0.16	0.0624	0.0099	0.0158	0.0033	<0.05	<0.05	--
	05/25/07		0.439	<0.238	<0.476	0.071	0.00114	0.0361	0.0453	<0.0005	<0.0005	<0.150	<0.025	<0.001	<0.001	0.0182	<0.001	<0.002	0.04	0.0335	0.003	0.00249	--	--	--	--
	08/24/07		0.102	<0.238	<0.476	<0.001	<0.002	<0.002	<0.006	<0.0005	<0.0005	<0.100	<0.020	<0.0005	<0.0005	0.059	<0.0005	<0.05	<0.001	<0.001	0.0032	<0.001	--	--	--	--
	11/26/07		<0.080	<0.236	<0.472	<0.001	<0.002	<0.002	<0.006	<0.0005	<0.0005	<0.100	<0.020	<0.0005	<0.0005	0.083	<0.0005	<0.05	<0.001	<0.001	<0.002	<0.001	--	--	--	--
	02/27/08		0.0817	<0.294	<0.588	0.005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	<0.100	<0.0010	<0.0005	<0.0005	0.015	<0.0005	<0.0005	<0.0005	<0.0005	0.00034 J	<0.0005	--	--	--	--
	03/31/10		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	0.045	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00051	<0.0005	--
	09/01/10		<0.250	<0.250	<0.500	0.0016	<0.0005	<0.0005	<0.0015	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	0.081	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00051	<0.0005	--
	12/16/14		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0005	--	--	<0.005	<0.005	<0.0005	<0.0005	0.008	<0.0005	--	--	--	--	--	--	--	--	<0.050
	03/25/15		<0.250	<0.046	<0.091	<0.0005	<0.0005	<0.0005	<0.001	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
	06/24/15		<0.250	<0.100	<0.250	<0.0005	<0.0005	<0.0005	<0.001	--	--	--	--	--	--	0.0428	--	--	--	--	--	--	--	--	--	--
	09/15/15		<0.250	0.17 D (see note)	0.37	<0.0005	<0.0005	<0.0005	<0.001	--	--	--	--	--	--	0.0061	--	--	--	--	--	--	--	--	--	--
MW-3	05/14/02	24.5-34.5	4.5	<0.250	<0.500	0.0419	0.0096	0.293	0.521	<0.001	<0.001	--	--	--	--	<4.00	--	0.0489	0.296	0.106	0.0213	0.0591	--	--	--	--
	05/19/03		--	--	--	0.0908	0.0097	0.338	0.5382	<0.05	<0.05	--	--	--	--	0.0037	--	0.0308	0.315	0.0895	0.0194	0.0623	--	--	--	--
	05/25/07		0.361	<0.238	<0.476	<0.0005	<0.0005	0.0132	0.0145	<0.0005	<0.0005	<0.150	<0.025	<0.001	<0.001	<0.002	<0.001	<0.002	0.0107	0.00348	0.00532	0.0093	0.0068	<0.05	<0.05	--
	08/24/07		<0.1	<0.238	<0.476	<0.001	<0.002	<0.002	<0.006	<0.0005	<0.0005	<0.100	<0.020	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.001	<0.001	<0.002	<0.001	--	--	--	--
	11/26/07		<0.080	<0.236	<0.472	0.0011	<0.002	0.0066	<0.006	<0.0005	<0.0005	<0.100	<0.020	<0.0005	<0.0005	0.0069	<0.0005	<0.05	<0.001	<0.001	0.0031	0.0012	--	--	--	--
	02/27/08		2.14	0.387 [6]	<0.500	<0.0005	<0.0005	0.17	0.17	<0.0005	<0.0005	<0.100	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	0.0064	0.21	0.051	0.022	0.056	--	--	--	--
	03/31/10		2.10	<0.250	<0.500	<0.0005	<0.0005	0.018	0.021	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	0.0018	0.24	<0.0005	0.019	0.050	0.0052	0.012	<0.0005	--
	09/01/10		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--
	12/16/14		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0005	--	--	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	--	--	--	--	--	--	--	--	<0.050
	03/25/15		<0.418	<0.046	<0.092	<0.0005	<0.0005	<0.0005	<0.001	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
	06/24/15		<0.250	0.120	<0.026	<0.0005	<0.0005	<0.0005	<0.001	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
	09/15/15		<0.250	0.140	<0.250	<0.0008	<0.0008	<0.0008	<0.001	--	--	--	--	--	--	<0.00084	--	--	--	--	--	--	--	--	--	--
MW-3 DUP	02/27/08	24.5-34.5	1.85	0.342	<0.485	0.0011	<0.0005	0.19	0.2	<0.0005	<0.0005	<0.100	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	0.0076	0.23	0.058	0.026	0.066	--	--	--	--
	03/31/10		1.90	<0.250	<0.500	<0.0015	<0.0015	0.018	0.020	<0.0015	<0.0015	<0.015	<0.007	<0.0015	<0.0015	<0.0015	<0.0015	0.0019	0.27	<0.0015	0.018	0.048	0.0050	0.012	<0.0015	--
	09/01/10		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--
MW-4	05/14/02	20-35	<0.080	0.358 [5]	<0.500	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	--	--	--	--	<0.002	--	<0.002	<0.001	<0.0005	<0.002	<0.0005	--	--	--	--
	05/19/03		--	--	--	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	--	--	--	--	<0.001	--	<0.002	<0.001	<0.001	<0.002	<0.001	--	--	--	--
	05/25/07		<0.080	<0.238	<0.476	<0.0002	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	<0.150	<0.025	<0.001	<0.001	<0.002	<0.001	<0.002	<0.001	<0.0005	<0.002	<0.0005	<0.05	<0.001	<0.001	--
	08/24/07		<0.1	<0.238	<0.476	<0.001	<0.002	<0.002	<0.006	<0.0005	<0.0005	<0.100	<0.020	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.001	<0.001	<0.002	<0.001	--	--	--	--
	11/26/07		<0.080	<0.236	<0.472	<0.001	<0.002	<0.002	<0.006	<0.0005	<0.0005	<0.100	<0.020	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.001	<0.001	<0.002	<0.001	--	--	--	--
	02/27/08		<0.080	<0.248	<0.495	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	<0.100	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	--	--	--
	03/31/10		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--
	09/01/10		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015	<0.0005	<0.0005	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--
	12/16/14		<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0005	--	--	<0.005	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	--	--	--	--	--	--	--	--	<0.050
	03/25/15		<0.250	0.074	<0.091	<0.0005	<0.0005	<0.0005	<0.001	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
	06/24/15		<0.250	<0.099	<0.250	<0.0005	<0.0005	<0.0005	<0.001	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
	09/15/15		<0.250	<0.130	<0.340	<0.0005	<0.0005	<0.0005	<0.001	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
MW-5	12/16/14	10-25	15	0.350	<0.500	0.00070	0.00066	0.12	1.2	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
	03/25/15		18.1	<0.045	<0.091	<0.00050	0.00061	0.218	1.45	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
	06/24/15		15	0.33 D (see note)	<0.250	<0.0012	<0.0012	0.228	1.51	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
	09/15/15		17.3	0.82 D (see note)	<0.34	<0.00050	0.00060	0.289	1.92	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--	--
Washington DOE MTCA Method A cleanup level [9]			0.800 [8]	0.5	0.5	0.005	1	0.7	1	NA	0.005	NA	NA	NA	NA	0.02	NA	0.16	NA	NA	NA	NA	NA	NA	NA	NA

Please refer to notes at end of table.

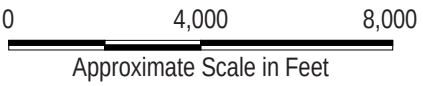
Table 2
Analytical Results from Groundwater Monitoring Wells
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Sample Date	Screened Interval (feet bgs)	Concentrations in mg/L (ppm)																					
			TPHg	TPHd	TPHho	Benzene	Toluene	Ethylbenzene	Xylenes	1,2-Dibromoethane	1,2-Dichloroethane	Ethanol	Tert-Butyl alcohol	Ethyl tert-Butyl Ether (ETBE)	Diisopropyl Ether (DIPE)	Methyl tert-butyl ether (MTBE)	Tert-Amyl Methyl Ether (TAME)	Naphthalene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Isopropyl-benzene	n-Propylbenzene	n-Butyl-benzene	sec-Butyl-benzene	Chloroform	Methanol
MW-5 DUP	12/16/14	10-25	15	<0.250	<0.500	0.00088	0.00081	0.18	1.3	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--
	03/25/15		17.2	<0.046	<0.092	0.0005	0.00065	0.236	1.22	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--
	06/24/15		16.8	0.560 D (see note)	<0.250	<0.0012	<0.0012	0.232	1.49	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--
MW-6	12/16/14	10-25	15	<0.250	<0.500	0.47	0.065	1.3	2.6	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--
	03/25/15		13.7	0.047	<0.092	0.516	0.0756	1.40	2.26	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--
	06/24/15		17.7	1.2 D (see note)	<0.250	0.423	0.0582	1.58	1.92	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--
	09/15/15		15.1	0.54 D (see note)	<0.34	0.306	0.0672	1.23	1.92	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--
	9/15/2015 DUP		14	0.44 D (see note)	<0.35	0.328	0.0684	1.32	2.07	--	--	--	--	--	--	<0.0005	--	--	--	--	--	--	--	--	--
Washington DOE MTCA Method A cleanup level[9.]			0.800 [8.]	0.5	0.5	0.005	1	0.7	1	NA	0.005	NA	NA	NA	NA	0.02	NA	0.16	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

1. TPHg = Total petroleum hydrocarbons in gasoline carbon range by NW-TPHgx method.
2. TPHd = Total petroleum hydrocarbons in diesel carbon range by NW-TPHdx method with silica gel cleanup.
3. TPHho = Total petroleum hydrocarbons ion heavy oil carbon range NW-TPHdx method with silica gel cleanup.
4. **Boldface** values represent concentration that exceeds MTCA Method A cleanup level.
5. Analysis completed without silica gel cleanup. Lab detected hydrocarbons with non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.
6. Hydrocarbon pattern most closely resembles a blend of heavy gas-/light diesel-range components.
7. mg/L (ppm) = Milligrams per liter (parts per million).
8. TPHg cleanup level dependent on presence of benzene in groundwater. Cleanup level = 0.800 mg/L if benzene is present and 1.00 mg/L if benzene is not present.
9. Washington DOE MTCA Method A cleanup level = Washington Department of Ecology Model Toxics Control Act Method A cleanup level.
10. < = Not detected at or above the specified laboratory method reporting limit (MRL).
11. bgs = below ground surface
12. The relative percent difference between TPHD concentrations in samples MW-5 and MW-5 DUP exceed the control limit of +/- 30%
13. D = Laboratory report noted discreet peaks that are not indicative of diesel. The laboratory chemist confirmed the peaks were from non-petroleum organic material.

Note: Base map prepared from USGS 7.5-minute quadrangle of Vancouver, WA, dated 2014 as provided by USGS.gov.



Site Location Map

September 2015 Groundwater Results Report
NuStar Terminals Operations Partnership, L.P. - Annex Terminal
Vancouver, Washington

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1569-05	Figure
October 2015		1

Legend:

- **SB-8R** Soil Boring Location (September 2014)
- **MW-1** Groundwater Monitoring Well Location
- DP-1 Grab Groundwater Sample Location
- GP-1 Deeper Direct-Push Geoprobe Location
- GP-1 Historical Direct-Push Boring Location (Approximate)
- PMW-1 Historical Temporary Well Location (Approximate)
- HA-1 Historical Hand Auger Location (Approximate)
- Excavation

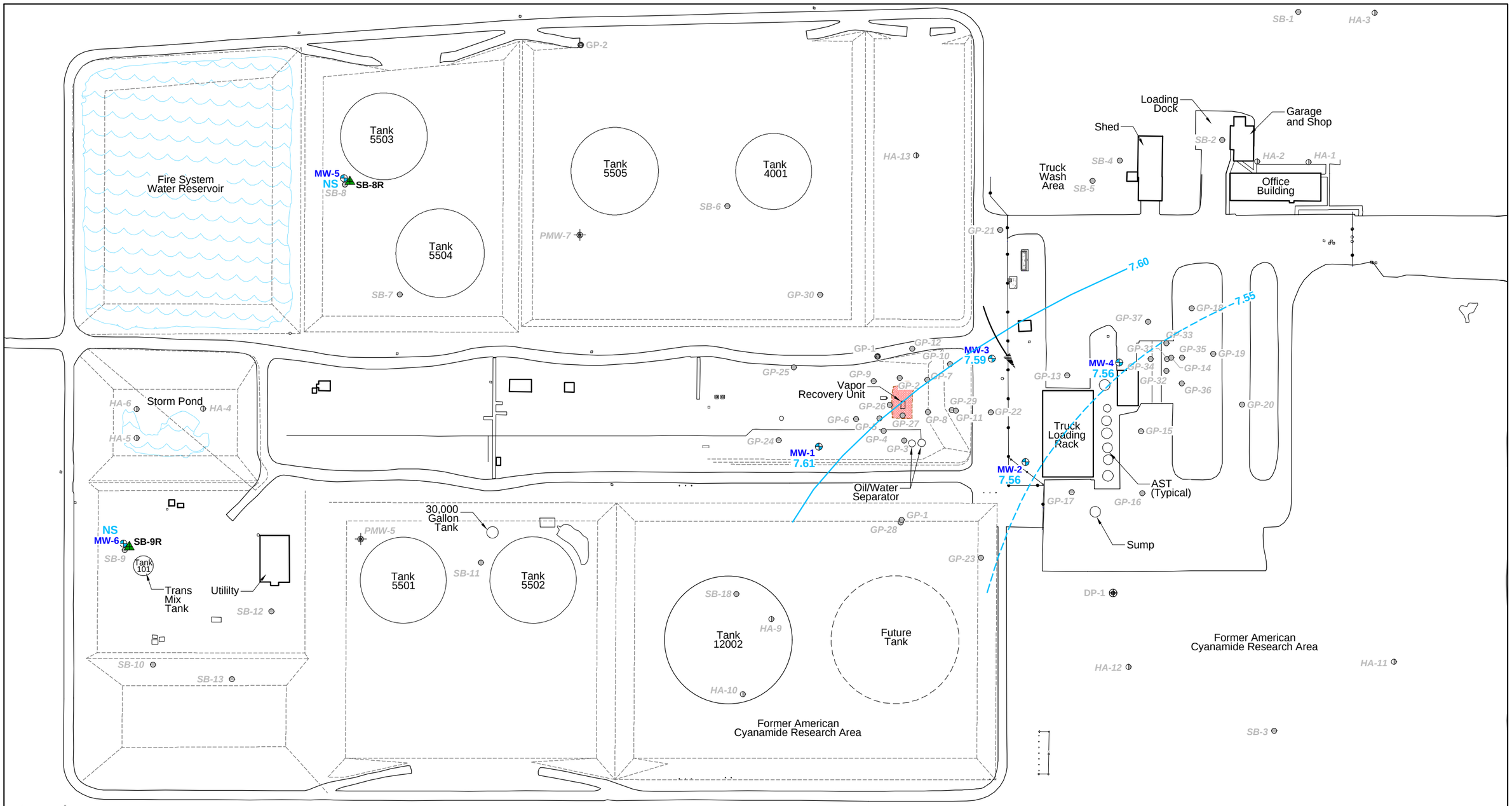
NOTE: Base map completed from a number of sources including but not limited to; Figure VAN1-21-002 provided by NuStar (1/8/2007) and a Monitoring Well Survey by Statewide Land Surveying, Inc.(10/30/2007). Locations of roads and containments are approximate. Aerial photograph from Google Earth Pro (7/14/2014).

Site Plan

September 2015 Groundwater Results Report
NuStar Terminals Operations Partnership, L.P. - Annex Terminal
Vancouver, Washington

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1569-05	Figure
October 2015		2



Legend:

- MW-1 / 7.61 — Groundwater Monitoring Well Location and Groundwater Elevation in Feet Above Mean Sea Limit (MSL)
- 7.55 — Groundwater Elevation Contour (Dashed Where Inferred)
- NS — Not Surveyed
- Inferred Groundwater Flow Direction
- SB-8R — Direct-Push Geoprobe Location
- GP-1 — Soil Boring Location (September 2014)
- DP-1 — Grab Groundwater Sample Location
- GP-1 — Historical Direct-Push Boring Location (Approximate)
- PMW-5 — Historical Temporary Well Location (Approximate)
- HA-1 — Historical Hand Auger Location (Approximate).
- Excavation

N

0 100 200

Scale in Feet

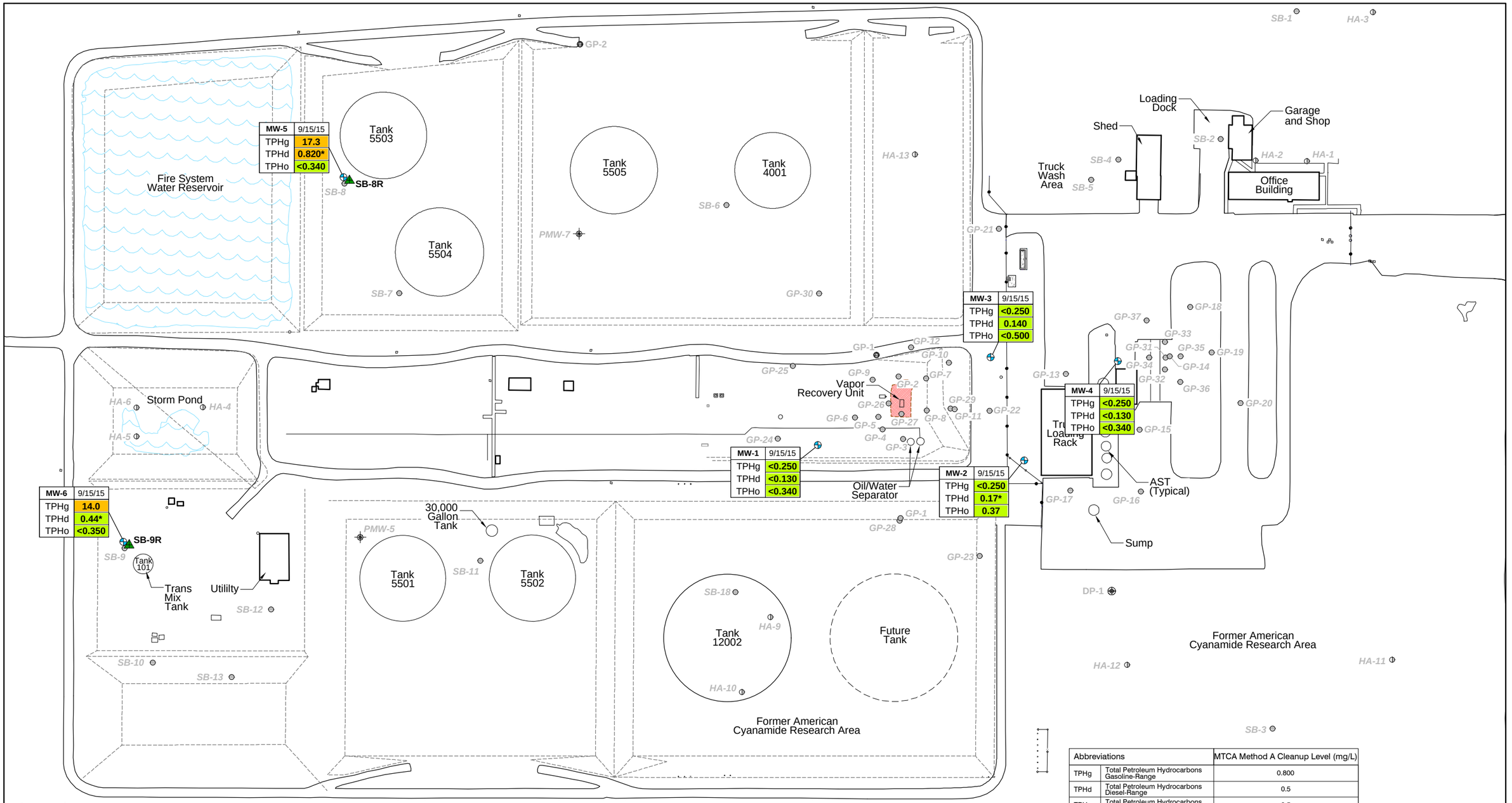
NOTE: Base map completed from a number of sources including but not limited to; Figure VAN1-21-002 provided by NuStar (1/8/2007) and a Monitoring Well Survey by Statewide Land Surveying, Inc (10/30/2007). Locations of roads and containments are approximate.

Groundwater Elevations - September 2015

September 2015 Groundwater Results Report
NuStar Terminals Operations Partnership, L.P. - Annex Terminal
Vancouver, Washington

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1569-05	Figure
October 2015		3



Abbreviations		MTCA Method A Cleanup Level (mg/L)
TPHg	Total Petroleum Hydrocarbons Gasoline-Range	0.800
TPHd	Total Petroleum Hydrocarbons Diesel-Range	0.5
TPHo	Total Petroleum Hydrocarbons Heavy Oil-Range	0.5

Legend:

- **SB-8R** Soil Boring Location (September 2014)
- **MW-1** Groundwater Monitoring Well Location
- DP-1 Grab Groundwater Sample Location
- GP-1 Deeper Direct-Push Geoprobe Location
- GP-1 Historical Direct-Push Boring Location (Approximate)
- PMW-5 Historical Temporary Well Location (Approximate)
- HA-1 Historical Hand Auger Location (Approximate)

Excavation

MW-1	9/15/15
TPHg	<0.250
TPHd	<0.130
TPHo	<0.340

Sample Identification
Date Sampled
Concentration in mg/L
Analyte Sampled

* Laboratory report noted discreet peaks that are not indicative of diesel. Laboratory chemist confirmed that the peaks were from non-petroleum organic material.

Concentration is Below MTCA Method A Cleanup Level

Concentration is Above MTCA Method A Cleanup Level

N

0 100 200

Scale in Feet

NOTE: Base map completed from a number of sources including but not limited to; Figure VAN1-21-002 provided by NuStar (1/8/2007) and a Monitoring Well Survey by Statewide Land Surveying, Inc (10/30/2007). Locations of roads and containments are approximate.

TPH Concentrations in Groundwater - September 2015

September 2015 Groundwater Results Report
NuStar Terminals Operations Partnership, L.P. - Annex Terminal
Vancouver, Washington

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1569-05
October 2015	

Figure 4

Abbreviations	MTCA Method A Cleanup Level (mg/L)
BEN Benzene	0.005
TOL Toluene	1
ETH Ethylbenzene	0.7
XYL Xylenes	1
MTBE Methyl Tert-Butyl Ether	0.02

Legend:

- **SB-8R** Soil Boring Location (September 2014)
- **MW-1** Groundwater Monitoring Well Location
- DP-1 Grab Groundwater Sample Location
- GP-1 Deeper Direct-Push Geoprobe Location
- *GP-1* Historical Direct-Push Boring Location (Approximate)
- *PMW-5* Historical Temporary Well Location (Approximate)
- *HA-1* Historical Hand Auger Location (Approximate)

Excavation

MW-1	9/15/15
BEN	<0.0005
TOL	<0.0005
ETH	0.0015
XYL	0.0022
MTBE	<0.0005

Sample Identification
Date Sampled
Concentration in mg/L
Analyte Sampled

Concentration is Below MTCA Method A Cleanup Level

Concentration is Above TCA Method A Cleanup Level

N

0 100 200

Scale in Feet

NOTE: Base map completed from a number of sources including but not limited to; Figure VAN1-21-002 provided by NuStar (1/8/2007) and a Monitoring Well Survey by Statewide Land Surveying, Inc (10/30/2007). Locations of roads and containments are approximate.

BTEX and MTBE Concentrations in Groundwater - September 2015

September 2015 Groundwater Results Report
NuStar Terminals Operations Partnership, L.P. - Annex Terminal
Vancouver, Washington

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number	1569-05	Figure
October 2015		5

Attachment A

Field Notes

APEX
3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER —
FIELD REPORT NUMBER —
PAGE 1 OF 1
DATE 9/15-11/5-

PROJECT V. Annex Gauge
LOCATION Vancouver WA
CLIENT Nustar
PURPOSE OF OBSERVATIONS Gauge
APEX REPRESENTATIVE Jm
CONTRACTOR —
CONTRACTOR REP. —

ARRIVAL TIME 0800
DEPARTURE TIME 1345
WEATHER Cloudy
APEX PROJECT MANAGER SBS
PERMIT NO. 19045G
H&S REVIEW

Our firm's professionals are represented on site solely to observe operations of the contractor identified, to form opinions about the adequacy of those operations, and to report those opinions to our client. The presence and activities of our field representative do not relieve any contractor from its obligation to meet contractual requirements. The contractor retains sole responsibility for site safety and the methods, operations, send sequence of construction. Unless signed by the Ash Creek Associates Project Manager, this report is preliminary. A preliminary report is provided solely as evidence that field observation was performed. Observations and/or conclusions and/or recommendations conveyed in the final report may vary from and shall take precedence over those included in a preliminary report.

0800 - Onsite/get permit
0805 - HASP review
0815 - Begin gauge
0900 - Complete gauge
0905 - Begin GW sampling
1315 - Complete GW Samp
1345 - Offsite

BY

APEX REPRESENTATIVE

REVIEWED BY

APEX PROJECT MANAGER

WELL GAGING DATA SHEET

APEX

		Job Number:	
Client:	Nustar V. Annex	Date:	9/15/15
Project:	Gauging	Sampler:	JM
Weather:	Cloudy	Time In/Out:	0800

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW-4	0815	-	32.61	-	-	-	-
MW-2	0820	-	30.65	-	-	-	-
MW-3	0830	-	31.52	-	-	-	-
MW-1	0840	-	19.05	-	-	-	-
MW-6	0850	-	19.70	-	-	-	-
MW-5	0900	-	19.35	-	-	-	-

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-5	Job Number:	—
Client:	Nustar V. Annex	Date:	9/15/15
Project:	GWM	Sampler:	JM
Weather:	Cloudy	Time In/Out:	0910

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	19.35	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	P. Pump	Pump Intake Depth:	NS	Comments	
Sampling Method:	LF	Tubing Type:	Horiz	—	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0913	—	—	19.35	0.20	5.32	14.35	593	2.07	21.7	—	C
0916	—	—	19.40	↓	5.42	14.26	575	1.95	30.2	—	C
0919	—	—	19.48	↓	5.53	14.07	541	1.66	23.2	—	C
0922	—	—	19.49	↓	5.54	14.05	541	1.63	22.9	—	C
0925	—	—	19.52	↓	5.54	14.07	542	1.64	23.0	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-5	Sampling Flow Rate	0.20	Analytical Laboratory:	PACE
Sample Time:	0930	Final Depth to Water:	20.91	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
7x40ml	HCl	—	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-6	Job Number:	—
Client:	Nustar	Date:	9/15/15
Project:	V. Annex GWM	Sampler:	JM
Weather:	Cloudy	Time In/Out:	0940

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	19.70	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	P. Pump				Pump Intake Depth:	MS				Comments	
Sampling Method:	LF				Tubing Type:	HDPE				—	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0943	—	—	19.70	0.20	5.66	13.84	768	1.22	18.7	—	C
0946	—	—	19.74	↓	5.67	13.85	767	1.09	18.5	—	C
0949	—	—	19.84	↓	5.81	13.91	756	0.93	4.4	—	C
0952	—	—	19.90	↓	5.82	13.88	755	0.93	3.9	—	C
0955	—	—	19.94	↓	5.83	13.89	755	0.94	3.9	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-6	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	1000	Final Depth to Water:	21.34	Did Well Dewater?	NO	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
7x40ml	HCl	—	yes (no)	—	—	—
7x40ml	HCl	—	yes (no)	—	—	MW-6 DUP*
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

* DUP: Same time as sample time

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-1	Job Number:	—
Client:	Mister V. Annex	Date:	9/15/15
Project:	GWM	Sampler:	JM
Weather:	Cloudy	Time In/Out:	1046

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	19.05'	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	P. Pump	Pump Intake Depth:	MS	Comments	
Sampling Method:	LF	Tubing Type:	HDPE		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1043	—	—	19.05	0.20	5.65	15.30	591	1.51	43.8	—	C
1046	—	—	19.57	|	5.61	15.24	589	1.41	46.4	—	C
1049	—	—	20.01	|	5.60	15.24	575	1.20	50.2	—	C
1052	—	—	20.26	↓	5.59	15.25	580	1.21	51.3	—	C
			[redacted]								

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	1100	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	MW-1	Final Depth to Water:	19.05'	Did Well Dewater?	No	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
7x40 ml	HCl	—	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-3	Job Number:	—
Client:	Nustar	Date:	9/15/15
Project:	V. Annex Gwin	Sampler:	JM
Weather:	Cloudy	Time In/Out:	1120

WELL DATA

Well Depth:	33.90	Well Diameter:	2"	Water Height	—
Depth to Water:	31.52	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	Bladder Pump	Pump Intake Depth:	MS
Sampling Method:	LF	Tubing Type:	SB

Comments: —

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1120	—	—	32.76	0.20	6.13	15.05	421	8.50	31.6	—	C
—	—	—	well		Dewatered.		Wait	for	Recharge		
			then		Sample	—	—	—	—	—	—

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-3	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	1140	Final Depth to Water:	31.50	Did Well Dewater?	Yes	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
7x40ml	HCl	—	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-4	Job Number:	
Client:	Nustar	Date:	9/15/15
Project:	V. Annex	Sampler:	Jm
Weather:	cloudy	Time In/Out:	1200

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	32.60	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	MS	Comments
Sampling Method:	LF	Tubing Type:	SB	—

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1200											
1203		—	Well Dewatered before flow cell								
1206			Was filled, NO parameters collected,								
1209			wait for re-charge to sample								—

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-4	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	1220	Final Depth to Water:	32.53	Did Well Dewater?	yes	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
7x40ml	HCl	—	yes no	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-2	Job Number:	—
Client:	NuStar	Date:	9/15/15
Project:	Van. Annex Gwm	Sampler:	Jm
Weather:	Cloudy	Time In/Out:	1300

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	30.64	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	BP	Pump Intake Depth:	25	Comments	
Sampling Method:	LF	Tubing Type:	SB	—	

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1300	—	—	30.64	0.20	6.51	15.67	252	1.73	7.3	—	SC
1303	—	—	30.90	↓	6.50	15.76	251	1.72	7.4	—	SC
1306	—	—	31.01	↓	6.51	15.71	253	1.69	7.5	—	SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-2	Sampling Flow Rate	0.20	Analytical Laboratory:	Pace	
Sample Time:	1315	Final Depth to Water:	31.71	Did Well Dewater?	No	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
7x 40ml	HCl	—	yes (no)	—	—	—
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Attachment B

Laboratory Analytical Results and Quality Assurance/Quality Control Review

Pace Analytical Services, Inc.
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(530) 297-4800

September 24, 2015

Joel Mattecheck
Apex Companies, LLC
3015 SW First Ave.
Portland, OR 97201

RE: Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Dear Joel Mattecheck:
Enclosed are the analytical results for sample(s) received by the laboratory on September 17, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Scott Forbes

Scott M Forbes
scott.forbes@pacelabs.com
Project Manager

Enclosures

cc: Stephanie Bosze-Salisbury, Apex Companies, LLC

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CERTIFICATIONS

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Davis Cerification IDs
2795 Second Street Suite 300 Davis, CA 95618
North Dakota Certification #: R-214
Oregon Certification #: CA300002
Washington Certification #: C926-14a
California Certification #: 08263CA

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SAMPLE SUMMARY

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1253623001	**MW-5**	Water	09/15/15 09:30	09/17/15 09:25
1253623002	**MW-6**	Water	09/15/15 10:00	09/17/15 09:25
1253623003	**MW-6 DUP**	Water	09/15/15 10:00	09/17/15 09:25
1253623004	**MW-1**	Water	09/15/15 11:00	09/17/15 09:25
1253623005	**MW-3**	Water	09/15/15 11:40	09/17/15 09:25
1253623006	**MW-4**	Water	09/15/15 12:20	09/17/15 09:25
1253623007	**MW-2**	Water	09/15/15 13:15	09/17/15 09:25

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SAMPLE ANALYTE COUNT

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Lab ID	Sample ID	Method	Analysts	Analytes Reported
1253623001	**MW-5**	NWTPH-Dx	DRM	3
		EPA 8260B	JMB	8
		NWTPH-Gx	JMB	4
1253623002	**MW-6**	NWTPH-Dx	DRM	3
		EPA 8260B	JMB	8
		NWTPH-Gx	JMB	4
1253623003	**MW-6 DUP**	NWTPH-Dx	DRM	3
		EPA 8260B	JMB	8
		NWTPH-Gx	JMB	4
1253623004	**MW-1**	NWTPH-Dx	DRM	3
		EPA 8260B	JMB	8
		NWTPH-Gx	JMB	4
1253623005	**MW-3**	NWTPH-Dx	DRM	3
		EPA 8260B	JMB	8
		NWTPH-Gx	JMB	4
1253623006	**MW-4**	NWTPH-Dx	DRM	3
		EPA 8260B	JMB	8
		NWTPH-Gx	JMB	4
1253623007	**MW-2**	NWTPH-Dx	DRM	3
		EPA 8260B	JMB	8
		NWTPH-Gx	JMB	4

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Sample: MW-5 **Lab ID: 1253623001** Collected: 09/15/15 09:30 Received: 09/17/15 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	**0.82**	mg/L	0.13	1	09/18/15 15:18	09/18/15 18:32		DG
Motor Oil Range	ND	mg/L	0.34	1	09/18/15 15:18	09/18/15 18:32		
Surrogates								
n-Octacosane (S)	112	%.	70-130	1	09/18/15 15:18	09/18/15 18:32	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		09/18/15 21:41	1634-04-4	
Benzene	ND	ug/L	0.50	1		09/18/15 21:41	71-43-2	
Toluene	**0.60**	ug/L	0.50	1		09/18/15 21:41	108-88-3	
Ethylbenzene	**289**	ug/L	0.50	1		09/18/15 21:41	100-41-4	
Xylene (Total)	**1920**	ug/L	5.0	5		09/22/15 20:37	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	111	%.	70-130	1		09/18/15 21:41	17060-07-0	
Toluene-d8 (S)	99	%.	70-130	1		09/18/15 21:41	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	70-130	1		09/18/15 21:41	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	**17300**	ug/L	1250	5		09/24/15 00:51		
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	70-130	1		09/18/15 21:25	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		09/18/15 21:25	2037-26-5	
4-Bromofluorobenzene (S)	113	%.	70-130	1		09/18/15 21:25	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Sample: MW-6 **Lab ID: 1253623002** Collected: 09/15/15 10:00 Received: 09/17/15 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	**0.54**	mg/L	0.13	1	09/18/15 15:18	09/18/15 19:07		DG
Motor Oil Range	ND	mg/L	0.34	1	09/18/15 15:18	09/18/15 19:07		
Surrogates								
n-Octacosane (S)	117	%.	70-130	1	09/18/15 15:18	09/18/15 19:07	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		09/18/15 22:06	1634-04-4	
Benzene	**306**	ug/L	5.0	10		09/23/15 15:16	71-43-2	
Toluene	**67.2**	ug/L	0.50	1		09/18/15 22:06	108-88-3	
Ethylbenzene	**1230**	ug/L	5.0	10		09/23/15 15:16	100-41-4	
Xylene (Total)	**1920**	ug/L	10.0	10		09/23/15 15:16	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%.	70-130	1		09/18/15 22:06	17060-07-0	
Toluene-d8 (S)	105	%.	70-130	1		09/18/15 22:06	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	70-130	1		09/18/15 22:06	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	**15100**	ug/L	1040	4.17		09/24/15 01:11		
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1		09/18/15 19:46	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		09/18/15 19:46	2037-26-5	
4-Bromofluorobenzene (S)	110	%.	70-130	1		09/18/15 19:46	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Sample: MW-6 DUP **Lab ID: 1253623003** Collected: 09/15/15 10:00 Received: 09/17/15 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	**0.44**	mg/L	0.14	1	09/18/15 15:18	09/18/15 19:42		DG
Motor Oil Range	ND	mg/L	0.35	1	09/18/15 15:18	09/18/15 19:42		
Surrogates								
n-Octacosane (S)	119	%.	70-130	1	09/18/15 15:18	09/18/15 19:42	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		09/18/15 22:31	1634-04-4	
Benzene	**328**	ug/L	5.0	10		09/23/15 16:46	71-43-2	
Toluene	**68.4**	ug/L	0.50	1		09/18/15 22:31	108-88-3	
Ethylbenzene	**1320**	ug/L	5.0	10		09/23/15 16:46	100-41-4	
Xylene (Total)	**2070**	ug/L	10.0	10		09/23/15 16:46	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	106	%.	70-130	1		09/18/15 22:31	17060-07-0	
Toluene-d8 (S)	103	%.	70-130	1		09/18/15 22:31	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	70-130	1		09/18/15 22:31	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	**14000**	ug/L	1040	4.17		09/24/15 01:31		
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	70-130	1		09/18/15 21:45	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		09/18/15 21:45	2037-26-5	
4-Bromofluorobenzene (S)	115	%.	70-130	1		09/18/15 21:45	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Sample: MW-1 **Lab ID: 1253623004** Collected: 09/15/15 11:00 Received: 09/17/15 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.13	1	09/18/15 15:18	09/18/15 16:47		
Motor Oil Range	ND	mg/L	0.34	1	09/18/15 15:18	09/18/15 16:47		
Surrogates								
n-Octacosane (S)	119	%.	70-130	1	09/18/15 15:18	09/18/15 16:47	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		09/18/15 22:56	1634-04-4	
Benzene	ND	ug/L	0.50	1		09/18/15 22:56	71-43-2	
Toluene	ND	ug/L	0.50	1		09/18/15 22:56	108-88-3	
Ethylbenzene	**1.5**	ug/L	0.50	1		09/18/15 22:56	100-41-4	
Xylene (Total)	**2.2**	ug/L	1.0	1		09/18/15 22:56	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%.	70-130	1		09/18/15 22:56	17060-07-0	
Toluene-d8 (S)	98	%.	70-130	1		09/18/15 22:56	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		09/18/15 22:56	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		09/24/15 00:12		
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	70-130	1		09/24/15 00:12	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1		09/24/15 00:12	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	70-130	1		09/24/15 00:12	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Sample: MW-3 **Lab ID: 1253623005** Collected: 09/15/15 11:40 Received: 09/17/15 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	**0.14**	mg/L	0.10	1	09/18/15 15:18	09/21/15 15:13		
Motor Oil Range	ND	mg/L	0.25	1	09/18/15 15:18	09/21/15 15:13		
Surrogates								
n-Octacosane (S)	48	%.	70-130	1	09/18/15 15:18	09/21/15 15:13	630-02-4	S5
8260 MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	0.84	1.67		09/19/15 01:25	71-43-2	
Ethylbenzene	ND	ug/L	0.84	1.67		09/19/15 01:25	100-41-4	
Methyl-tert-butyl ether	ND	ug/L	0.84	1.67		09/19/15 01:25	1634-04-4	
Toluene	ND	ug/L	0.84	1.67		09/19/15 01:25	108-88-3	
Xylene (Total)	ND	ug/L	1.7	1.67		09/19/15 01:25	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	108	%.	70-130	1.67		09/19/15 01:25	17060-07-0	
Toluene-d8 (S)	97	%.	70-130	1.67		09/19/15 01:25	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1.67		09/19/15 01:25	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		09/24/15 00:31		
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	70-130	1		09/24/15 00:31	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		09/24/15 00:31	2037-26-5	
4-Bromofluorobenzene (S)	104	%.	70-130	1		09/24/15 00:31	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Sample: MW-4 **Lab ID: 1253623006** Collected: 09/15/15 12:20 Received: 09/17/15 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.13	1	09/18/15 15:18	09/18/15 20:52		
Motor Oil Range	ND	mg/L	0.34	1	09/18/15 15:18	09/18/15 20:52		
Surrogates								
n-Octacosane (S)	118	%.	70-130	1	09/18/15 15:18	09/18/15 20:52	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		09/18/15 23:21	1634-04-4	
Benzene	ND	ug/L	0.50	1		09/18/15 23:21	71-43-2	
Toluene	ND	ug/L	0.50	1		09/18/15 23:21	108-88-3	
Ethylbenzene	ND	ug/L	0.50	1		09/18/15 23:21	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		09/18/15 23:21	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%.	70-130	1		09/18/15 23:21	17060-07-0	
Toluene-d8 (S)	87	%.	70-130	1		09/18/15 23:21	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		09/18/15 23:21	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		09/18/15 22:24		
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%.	70-130	1		09/18/15 22:24	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		09/18/15 22:24	2037-26-5	
4-Bromofluorobenzene (S)	107	%.	70-130	1		09/18/15 22:24	460-00-4	

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ANALYTICAL RESULTS

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Sample: MW-2 **Lab ID: 1253623007** Collected: 09/15/15 13:15 Received: 09/17/15 09:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	**0.17**	mg/L	0.14	1	09/18/15 15:18	09/18/15 21:27		DM
Motor Oil Range	**0.37**	mg/L	0.34	1	09/18/15 15:18	09/18/15 21:27		
Surrogates								
n-Octacosane (S)	97	%.	70-130	1	09/18/15 15:18	09/18/15 21:27	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	**6.1**	ug/L	0.50	1		09/18/15 23:46	1634-04-4	
Benzene	ND	ug/L	0.50	1		09/18/15 23:46	71-43-2	
Toluene	ND	ug/L	0.50	1		09/18/15 23:46	108-88-3	
Ethylbenzene	ND	ug/L	0.50	1		09/18/15 23:46	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		09/18/15 23:46	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	106	%.	70-130	1		09/18/15 23:46	17060-07-0	
Toluene-d8 (S)	95	%.	70-130	1		09/18/15 23:46	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	70-130	1		09/18/15 23:46	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		09/18/15 22:44		
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%.	70-130	1		09/18/15 22:44	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		09/18/15 22:44	2037-26-5	
4-Bromofluorobenzene (S)	106	%.	70-130	1		09/18/15 22:44	460-00-4	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

QC Batch: DAOP/1345 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS, Silica Gel
Associated Lab Samples: 1253623001, 1253623002, 1253623003, 1253623004, 1253623005, 1253623006, 1253623007

METHOD BLANK: 248276 Matrix: Water
Associated Lab Samples: 1253623001, 1253623002, 1253623003, 1253623004, 1253623005, 1253623006, 1253623007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Fuel Range	mg/L	ND	0.10	09/21/15 14:38	
Motor Oil Range	mg/L	ND	0.25	09/21/15 14:38	
n-Octacosane (S)	%.	114	70-130	09/21/15 14:38	

LABORATORY CONTROL SAMPLE: 248277

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Fuel Range	mg/L	1.2	1.2	99	70-130	
Motor Oil Range	mg/L		.068J			
n-Octacosane (S)	%.			117	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 248278 248279

Parameter	Units	1253623001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diesel Fuel Range	mg/L	0.82	1.2	1.2	2.3	1.6	121	69	70-130	33	25	M3
Motor Oil Range	mg/L	ND			0.25	.077J					25	
n-Octacosane (S)	%.						131	119	70-130			S5

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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(530) 297-4800

QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

QC Batch: DAVM/2173 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 1253623001, 1253623002, 1253623003, 1253623004, 1253623005, 1253623006, 1253623007

METHOD BLANK: 248508 Matrix: Water
Associated Lab Samples: 1253623001, 1253623002, 1253623003, 1253623004, 1253623005, 1253623006, 1253623007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	0.50	09/18/15 19:37	
Ethylbenzene	ug/L	ND	0.50	09/18/15 19:37	
Methyl-tert-butyl ether	ug/L	ND	0.50	09/18/15 19:37	
Toluene	ug/L	ND	0.50	09/18/15 19:37	
Xylene (Total)	ug/L	ND	1.0	09/18/15 19:37	
1,2-Dichloroethane-d4 (S)	%.	109	70-130	09/18/15 19:37	
4-Bromofluorobenzene (S)	%.	99	70-130	09/18/15 19:37	
Toluene-d8 (S)	%.	100	70-130	09/18/15 19:37	

LABORATORY CONTROL SAMPLE: 248509

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	40	39.8	100	70-130	
Ethylbenzene	ug/L	40	41.3	103	70-130	
Methyl-tert-butyl ether	ug/L	40	42.1	105	70-130	
Toluene	ug/L	40	41.7	104	70-130	
Xylene (Total)	ug/L	120	119	99	70-130	
1,2-Dichloroethane-d4 (S)	%.			110	70-130	
4-Bromofluorobenzene (S)	%.			103	70-130	
Toluene-d8 (S)	%.			102	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 248510 248511

Parameter	Units	1253602003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	ND	40	40	40.9	40.6	102	102	70-130	1	25	
Ethylbenzene	ug/L	ND	40	40	41.4	41.6	103	104	70-130	1	25	
Methyl-tert-butyl ether	ug/L	ND	40	40	42.6	41.9	106	105	70-130	2	25	
Toluene	ug/L	1.0	40	40	42.0	41.5	102	101	70-130	1	25	
Xylene (Total)	ug/L	1.4	120	120	119	120	98	98	70-130	0	25	
1,2-Dichloroethane-d4 (S)	%.						109	109	70-130			
4-Bromofluorobenzene (S)	%.						98	97	70-130			
Toluene-d8 (S)	%.						99	97	70-130			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Davis, CA 95618
(530) 297-4800

QUALITY CONTROL DATA

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

QC Batch: DAVM/2172 Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx Analysis Description: NWTPH-Gx Water MSV
Associated Lab Samples: 1253623001, 1253623002, 1253623003, 1253623004, 1253623005, 1253623006, 1253623007

METHOD BLANK: 248500 Matrix: Water
Associated Lab Samples: 1253623001, 1253623002, 1253623003, 1253623004, 1253623005, 1253623006, 1253623007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TPH as Gas	ug/L	ND	250	09/18/15 19:26	
1,2-Dichloroethane-d4 (S)	%.	102	70-130	09/18/15 19:26	
4-Bromofluorobenzene (S)	%.	98	70-130	09/18/15 19:26	
Toluene-d8 (S)	%.	100	70-130	09/18/15 19:26	

LABORATORY CONTROL SAMPLE: 248501

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
TPH as Gas	ug/L	480	500	104	70-130	
1,2-Dichloroethane-d4 (S)	%.			99	70-130	
4-Bromofluorobenzene (S)	%.			110	70-130	
Toluene-d8 (S)	%.			101	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 248502 248503

Parameter	Units	1253623002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
TPH as Gas	ug/L	15100	480	480	14100	12200	-202	-611	70-130	15	25	E
1,2-Dichloroethane-d4 (S)	%.						101	98	70-130			
4-Bromofluorobenzene (S)	%.						112	115	70-130			
Toluene-d8 (S)	%.						102	102	70-130			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

QUALIFIERS

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

DG	Lower boiling hydrocarbons present, atypical for Diesel Fuel.
DM	Higher boiling hydrocarbons present, atypical for Diesel Fuel.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

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Davis, CA 95618
(530) 297-4800

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NuStar Vancouver GWM
Pace Project No.: 1253623

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1253623001	**MW-5**	EPA 3510	DAOP/1345	NWTPH-Dx	DASG/1319
1253623002	**MW-6**	EPA 3510	DAOP/1345	NWTPH-Dx	DASG/1319
1253623003	**MW-6 DUP**	EPA 3510	DAOP/1345	NWTPH-Dx	DASG/1319
1253623004	**MW-1**	EPA 3510	DAOP/1345	NWTPH-Dx	DASG/1319
1253623005	**MW-3**	EPA 3510	DAOP/1345	NWTPH-Dx	DASG/1319
1253623006	**MW-4**	EPA 3510	DAOP/1345	NWTPH-Dx	DASG/1319
1253623007	**MW-2**	EPA 3510	DAOP/1345	NWTPH-Dx	DASG/1319
1253623001	**MW-5**	EPA 8260B	DAVM/2173		
1253623002	**MW-6**	EPA 8260B	DAVM/2173		
1253623003	**MW-6 DUP**	EPA 8260B	DAVM/2173		
1253623004	**MW-1**	EPA 8260B	DAVM/2173		
1253623005	**MW-3**	EPA 8260B	DAVM/2173		
1253623006	**MW-4**	EPA 8260B	DAVM/2173		
1253623007	**MW-2**	EPA 8260B	DAVM/2173		
1253623001	**MW-5**	NWTPH-Gx	DAVM/2172		
1253623002	**MW-6**	NWTPH-Gx	DAVM/2172		
1253623003	**MW-6 DUP**	NWTPH-Gx	DAVM/2172		
1253623004	**MW-1**	NWTPH-Gx	DAVM/2172		
1253623005	**MW-3**	NWTPH-Gx	DAVM/2172		
1253623006	**MW-4**	NWTPH-Gx	DAVM/2172		
1253623007	**MW-2**	NWTPH-Gx	DAVM/2172		

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APEX

CHAIN OF CUSTODY RECORD

Client Name: Apex/Ash Creek
Address: 3015 SW First Ave
City/State/Zip: Portland, OR 97201

Telephone Number: 503.924.4704
Fax No.: 503.943.6357

Project Manager: Stephanie Bosze Salisbury 503-924-4704 x1925
Analytical Lab: Pace 12533623

Project Name: NuStar Vacouver GWM
Report To: sbosze@apexcos.com

Project Number: 1569-05 T2
Page: 1 of 1

Sampler Name: J. Mattecheck

Sample ID / Description	Date Sampled	Time Sampled	No. of Containers Shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO_3 (Red Label)	HCl (Blue Label)	NaOH (Orange Label)	H_2SO_4 Plastic (Yellow Label)	H_2SO_4 Glass(Yellow Label)	None (Black Label)	Other (Specify)	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	Analyze For: TPH-diesel and heavy oil -NWTPG-Dx with silica gel cle	NWTPH-Gx	BTEX, MTBE ONLY by 8260B	RUSH TAT (Pre-Schedule)	Standard TAT	Fax Results	Send QC with report	
MW-5	9/15/15	0930	7	X			X		X						X						X	X	X		X			001
MW-6	9/15/15	1000	7	X			X		X						X						X	X	X		X			006
MW-6 DUP	9/15/15	1000	7	X			X		X						X						X	X	X		X			003
MW-1	9/15/15	1100	7	X			X		X						X						X	X	X		X			004
MW-3	9/15/15	1140	7	X			X		X						X						X	X	X		X			005
MW-4	9/15/15	1220	7	X			X		X						X						X	X	X		X			006
MW-2	9/15/15	1315	7	X			X		X						X						X	X	X		X			007

Special Instructions:

Laboratory Comments:
Temperature Upon Receipt: 4.4°C
VOCs Free of Headspace? (Y) N

Method of Shipment: FexEx

Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time
Joel Mattecheck / Apex Companies	9/16/2015	0800	Cameron Richards PACE DAVIS	091715	9:25
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time

Pace Analytical®	Document Name: Sample Condition Upon Receipt Form	Document Revised: 25Feb2015 Page 1 of 1
	Document No.: F-DAV-C-002-rev.02	Issuing Authority: Pace Davis, CA Quality Office

Sample Condition Upon Receipt **Client Name:** APEX **Project #:** WO# : 1253623 (1253623)

Courier: ☐Fed Ex ☐UPS ☐USPS ☐Client ☐Commercial ☐Pace ☐OnTrac ☐Other: N/A

Tracking Number: 9745 2192 9485

Custody Seal on Cooler/Box Present? ☐Yes ☐No **Seals Intact?** ☐Yes ☐No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: ☑Bubble Wrap ☑Bubble Bags ☐None ☐Other: N/A **Temp Blank?** ☐Yes ☒No

Thermom. Used: ☑DA1434 ☐DA2285 **Type of Ice:** ☒Wet ☐Blue ☐Dry Ice ☐None ☐Samples on ice, cooling process has begun

Cooler Temp Read(°C): 4.6 **Cooler Temp Corrected(°C):** 4.4 **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.2 **Date and Initials of Person Examining Contents:** CAR 091715

				Comments:
Chain of Custody Present?	☑Yes	☐No	☐N/A	1.
Chain of Custody Filled Out?	☑Yes	☐No	☐N/A	2.
Chain of Custody Relinquished?	☑Yes	☐No	☐N/A	3.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☑Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No	☐N/A	6.
Rush Turn Around Time Requested?	☐Yes	☑No	☐N/A	7.
Sufficient Volume?	☑Yes	☐No	☐N/A	8.
Correct Containers Used?	☑Yes	☐No	☐N/A	9.
-Pace Containers Used?	☑Yes	☐No	☐N/A	
Containers Intact?	☑Yes	☐No	☐N/A	10.
Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	~~☒Yes~~ 091715	☑No	☐N/A	12. Sample -004 has one container labeled as MW11. The date and time matches sample -004.
All containers needing acid/base preservation have been checked?	☐Yes	☑No	☐N/A	13. ☐HNO_3 ☐H_2SO_4 ☐NaOH ☐HCl Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	CHECK-IN-LAB ☑Yes	☐No	☐N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☑Yes	☐No		Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐Yes	☑No	☐N/A	14.
Trip Blank Present?	☐Yes	☑No	☐N/A	15.
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Scott Fikes **Date:** 9/18/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

APEX

CHAIN OF CUSTODY RECORD

Client Name: Apex/Ash Creek
Address: 3015 SW First Ave
City/State/Zip: Portland, OR 97201

Telephone Number: 503.924.4704
Fax No.: 503.943.6357

Project Manager: Stephanie Bosze Salisbury 503-924-4704 x1925
Analytical Lab: Pace 12536 23

Project Name: NuStar Vacouver GWM
Report To: sbosze@apexcos.com

Project Number: 1569-05 T2
Page: 1 of 1

Sampler Name: J. Mattecheck

Sample ID / Description	Date Sampled	Time Sampled	No. of Containers Shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO_3 (Red Label)	HCl (Blue Label)	NaOH (Orange Label)	H_2SO_4 Plastic (Yellow Label)	H_2SO_4 Glass(Yellow Label)	None (Black Label)	Other (Specify)	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other (specify):	Analyze For: TPH-diesel and heavy oil -NWTPG-Dx with silica gel cle	NWTPH-Gx	BTEX, MTBE ONLY by 8260B										RUSH TAT (Pre-Schedule)	Standard TAT	Fax Results	Send QC with report	
MW-5	9/15/15	0930	7	X			X		X						X						X	X	X											X		001
MW-6	9/15/15	1000	7	X			X		X						X						X	X	X											X		006
MW-6 DUP	9/15/15	1000	7	X			X		X						X						X	X	X											X		003
MW-1	9/15/15	1100	7	X			X		X						X						X	X	X											X		004
MW-3	9/15/15	1140	7	X			X		X						X						X	X	X											X		005
MW-4	9/15/15	1220	7	X			X		X						X						X	X	X											X		006
MW-2	9/15/15	1315	7	X			X		X						X						X	X	X											X		007

Special Instructions:

Laboratory Comments:
Temperature Upon Receipt: 4.4°C
VOCs Free of Headspace? (Y) N

Method of Shipment: FexEx

Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time
Joel Mattecheck / Apex Companies	9/16/2015	0800	Cameron Richards PACE DAVIS	091715	9:25
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time
Relinquished by: Name/Company	Date	Time	Received by: Name/Company	Date	Time

Pace Analytical®	Document Name: Sample Condition Upon Receipt Form	Document Revised: 25Feb2015 Page 1 of 1
	Document No.: F-DAV-C-002-rev.02	Issuing Authority: Pace Davis, CA Quality Office

Sample Condition Upon Receipt

Client Name: APEX

Project #: WO# : 1253623

1253623

Courier: ☐Fed Ex ☐UPS ☐USPS ☐Client ☐Commercial ☐Pace ☐OnTrac ☐Other: N/A

Tracking Number: 9745 2192 9485

Custody Seal on Cooler/Box Present? ☐Yes ☐No **Seals Intact?** ☐Yes ☐No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☑Bubble Wrap ☑Bubble Bags ☐None ☐Other: N/A **Temp Blank?** ☐Yes ☒No

Thermom. Used: ☑DA1434 ☐DA2285 **Type of Ice:** ☒Wet ☐Blue ☐Dry Ice ☐None ☐Samples on ice, cooling process has begun

Cooler Temp Read(°C): 4.6 **Cooler Temp Corrected(°C):** 4.4 **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.2 **Date and Initials of Person Examining Contents:** CAR 091715

				Comments:
Chain of Custody Present?	☑Yes	☐No	☐N/A	1.
Chain of Custody Filled Out?	☑Yes	☐No	☐N/A	2.
Chain of Custody Relinquished?	☑Yes	☐No	☐N/A	3.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☑Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No	☐N/A	6.
Rush Turn Around Time Requested?	☐Yes	☑No	☐N/A	7.
Sufficient Volume?	☑Yes	☐No	☐N/A	8.
Correct Containers Used?	☑Yes	☐No	☐N/A	9.
-Pace Containers Used?	☑Yes	☐No	☐N/A	
Containers Intact?	☑Yes	☐No	☐N/A	10.
Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	~~☒Yes~~ ☑ 091715	☐No	☐N/A	12. Sample -004 has one container labeled for MW11. The date and time matches sample -004.
All containers needing acid/base preservation have been checked?	☐Yes	☑No	☐N/A	13. ☐HNO_3 ☐H_2SO_4 ☐NaOH ☐HCl Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	CHECK-IN-LAB ☑Yes	☐No	☐N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☑Yes	☐No		Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐Yes	☑No	☐N/A	14.
Trip Blank Present?	☐Yes	☑No	☐N/A	15.
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Scott Fikes **Date:** 9/18/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)