environ strategy consultants, inc.

1036 W. Taft Avenue
Orange, Californina 92865
Tel 714-919-6500
Fax 714-919-6501
www.environstrategy.com

October 15, 2012

Mr. Walter Sprague
Pacific Convenience & Fuels, LLC
7180 Koll Center Parkway, Suite 100
Pleasanton, CA 94566

Remediation System Status Report
Site 01-352
4200 Wheaton Way
Bremerton, Washington

Dear Mr. Sprague:

Environ Strategy Consultants Inc. (Environ Strategy) has prepared this *Remediation System Status Report* (Report) for the above referenced site. The Report summarizes the soil vapor extraction (SVE) system operation, field data and laboratory analytical results collected since system start-up on February 28, 2012.

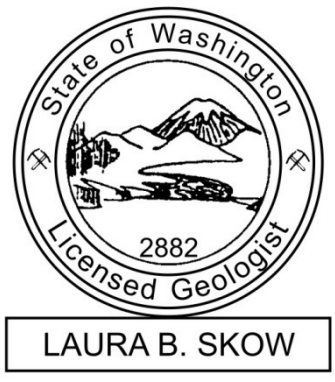
The SVE system is operated at the site to remediate fuel hydrocarbon-impacted soil. This Report summarizes remediation system operations and performance, field data and analytical results collected during the first six months of system operation. Laboratory data packages are attached as Appendix A.

Environ Strategy appreciates the opportunity to be of service. If you have any questions or require additional information regarding this report, please do not hesitate to contact us at (714) 919-6500.

Sincerely,
ENVIRON STRATEGY

Dane Nygaard
Project Engineer

Laura Skow, L.G., 2882
Project Manager



SITE INFORMATION AND CONTRACTOR OVERVIEW

Site Location:	Site 01-352 4200 Wheaton Way Bremerton, Washington
Pacific Convenience & Fuels Contact:	Mr. Walter Sprague
Environ Strategy Contact:	Ms. Laura Skow
Regulatory Agency:	Ms. Glynis Carrosino Toxics Cleanup Program Washington Dept of Ecology NWRO 3190 160th Avenue SE Bellevue, WA 98008-5452
File No:	VCP No. NW2340
Laboratory Contractor:	Environmental Services Network (ESN) Northwest, Inc. 1210 Eastside Street SE, Suite 200 Olympia, Washington 98501 WADOE Accreditation No. C574-11

SITE BACKGROUND

The subject site is located at 4200 Wheaton Way in Bremerton, Washington and is approximately a 0.5-acre rectangular-shaped, outparcel of commercial land located on the northeast corner of Wheaton Way and Hollis Street. The site is a fuel retail station with four underground storage tanks (USTs) and three pump islands that are located near (west of) a single-story convenience store. The USTs include one 6,000-gallon tank (diesel), two 12,000-gallon tanks (regular gasoline) and one 12,000-gallon tank (premium gasoline). The site is relatively flat, covered with asphalt and concrete, and is part of a larger retail shopping center. Surrounding land use includes commercial properties including retail shops and restaurants.

The site lies at an elevation of approximately 300 feet above mean sea level (ft amsl) on a small peninsula within Puget Sound. It is located approximately 2 miles from Port Orchard Waterway,

Dyes Inlet and Sinclair Inlet, which surround the peninsula to the east, west and south, respectively. A site location map is provided as Figure 1. Pertinent site features are shown on Figure 2.

In September and October 1996, the fuel distribution system at the subject site was upgraded. During system upgrades, hydrocarbon-affected soil was encountered in the tank cavity and 450 tons of impacted soil was excavated and transported to a disposal facility in Tacoma, Washington. The release was reported to the Washington Department of Ecology (DOE) and five verification soil samples were collected from the tank cavity for laboratory analysis. In addition, five soil samples were collected from the beneath the product lines and pump islands. The samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds and total petroleum hydrocarbons quantified as gasoline (TPH-Gx). Hydrocarbon impacts in excess of MTCA Method A Cleanup Levels were identified in all ten soil samples. Specifically, the highest levels of fuel hydrocarbons were reported in a composite sample (identified as N&E Wall-8'), which was collected from the north and east sidewall of the diesel tank cavity at a depth of 8 feet. Sample N&E Wall-8' contained TPH-Gx at 7,220 milligrams per kilogram (mg/kg), benzene at 27.6 mg/kg, toluene at 191 mg/kg, ethylbenzene at 111 mg/kg and total xylenes at 626 mg/kg.

In June 1997, Clearwater conducted subsurface site assessment activities. During Clearwater's investigation, 17 soil borings (GP-1 through GP-17) were installed at various locations around the site to delineate the extent of hydrocarbon-affected soil. Borings were terminated at a depth of 17 feet bgs due to refusal. Twenty-six (26) soil samples collected from the borings were analyzed for TPH-Gx and BTEX compounds. Hydrocarbon-affected soil was detected in a majority of the soil borings. The highest concentration of TPH-Gx (1,410 mg/kg) was in a 10-foot sample from boring GP-7 located near the southwest corner of the tank cavity. Similarly, benzene was detected at a maximum level of 11.9 mg/kg in a 10-foot sample collected from GP-5 located east of the existing tank cavity.

In May 2010, Environ Strategy conducted an additional site assessment to evaluate subsurface conditions in the vicinity of the fuel distribution system (USTs and pump islands). Six soil borings (identified as SB-1 through SB-6) were advanced, of which, Borings SB-1, SB-2 and SB-3 were located near the existing tank cavity and advanced to a depth of 30 feet. Borings SB-4, SB-5 and SB-6 were drilled at the west end of the southern, central and northern pump islands, respectively, and extended to a depth of 25 feet at SB-4 and to 20 feet bgs at SB-5 and SB-6. Assessment findings are detailed in the *Focused Phase II Site Assessment Report,* dated

May 30, 2010.

Based on the results of site assessment, an SVE system was designed and vapor extraction wells VE-1 through VE-4 were installed from March 29 to 31, 2011. Remediation by SVE was pilot tested at the site from April 4 to 7, 2011, and proved effective at removing hydrocarbons from subsurface soil, as detailed in the *Soil Vapor Extraction Well Installation and Pilot Test Report*, dated June 21, 2011.

REMEDIATION ACTIVITIES PERFORMED

- An application for an air discharge permit for the operation of SVE equipment at the site for the remediation of hydrocarbons in soil was submitted on June 6, 2011.

- The air discharge permit for the operation of SVE equipment at the site was received from the Puget Sound Clean Air Agency on November 7, 2011.

- SVE system trenching and underground conveyance piping was installed in the Fourth Quarter of 2011 by Clearcreek Contractors of Everett, Washington. A thermal oxidizer was subsequently installed and tested to comply with the air discharge permit.

- On February 15, 2012, baseline samples were collected to demonstrate compliance with the air discharge permit requirements. Laboratory analytical reports are attached in Appendix A.

- On February 28, 2012, the SVE system began continuous operation for the remediation of hydrocarbons in subsurface soil. Environ Strategy began bi-monthly site visits for operation and maintenance (O&M) of the system. Vapor flow rates, vacuum, system temperatures, and concentrations of unspeciated hydrocarbons in vapor in system influent, effluent, and individual wells were recorded at each visit. Vapor samples were collected monthly from system influent and effluent sample ports and submitted for laboratory analysis. Field data is summarized in Table 1. Individual well data is summarized in Table 2. Field data sheets are attached in Appendix B.

- Influent concentrations of total petroleum hydrocarbons quantified as gasoline (TPH-Gx) ranged from 44,000 micrograms per cubic meter ($\mu g/m^3$) on June 19, 2012, to 3,300,000 $\mu g/m^3$ on February 15, 2012, according to laboratory analytical reports. Laboratory analytical results are summarized in Table 3.

- Hydrocarbon removal rates during the first six months or operation ranged from 45 pounds per day in March 2012 to 1,492 pounds per day in August 2012, as calculated from field photo-ionization detector (PID) measurements (Table 1).

- The system was found off on July 17, 2012, due to suspected power interruption and was re-started.

- In August 2012, the system was found to be shutting off due to backpressure caused by plugging in the catalytic cell. The catalytic cell was cleaned and reinstalled in September 2012.

DISCUSSION AND CONCLUSIONS

Field observations and laboratory test results during the first six months of remediation demonstrate that soil vapor extraction is effective at removing petroleum constituents from subsurface soil beneath the site. During the first six months of operation, an estimated total of 7,461 pounds of petroleum hydrocarbons were extracted from the site subsurface, thermally treated and discharged. Trends in hydrocarbon concentrations in vapor, cumulative mass removed and individual well concentrations are graphically illustrated in Graphs 1 and 2. As shown in Graph 1, hydrocarbon concentrations in system influent vapor have fluctuated since system start-up but show an increasing trend as select extraction wells are opened/closed to optimize system performance (Tables 1 and 2). Field PID readings from the individual extraction wells show hydrocarbon concentrations have fluctuated over time and exhibit an increase during the recent dry season (Graph 2).

Based on 2010 soil data, the site is estimated to contain approximately 42,354 pounds of hydrocarbons in soil (Table 4), considerably higher than estimates based on previous soil sample data. It should be noted that the hydrocarbon mass estimate is based on available data and calculated averages assuming distribution is uniform within the specified depth intervals and estimated area of impact. Although hydrocarbon removal rates have increased during the dry season; based on the current hydrocarbon removal rate and the expectation that removal rates will decline as the amount of remaining hydrocarbons decreases, a minimum of six additional months of system operation is estimated to be required to remove remaining hydrocarbons in soil to achieve target concentrations.

Environ Strategy is pleased to be of service to Mr. Walter Sprague and Pacific Convenience & Fuels, Inc. If there are questions regarding this report or if additional site information is required, please do not hesitate to contact Environ Strategy at (714) 919-6500.

ATTACHMENTS:

FIGURES

Figure 1:	Site Location Map
Figure 2:	Site Plan Showing Well Locations

TABLES

Table 1:	Summary of Vapor Extraction System Operational Data
Table 2:	SVE Well Data
Table 3:	SVE Influent and Effluent Analytical Data
Table 4:	Subsurface Hydrocarbon Mass Calculations

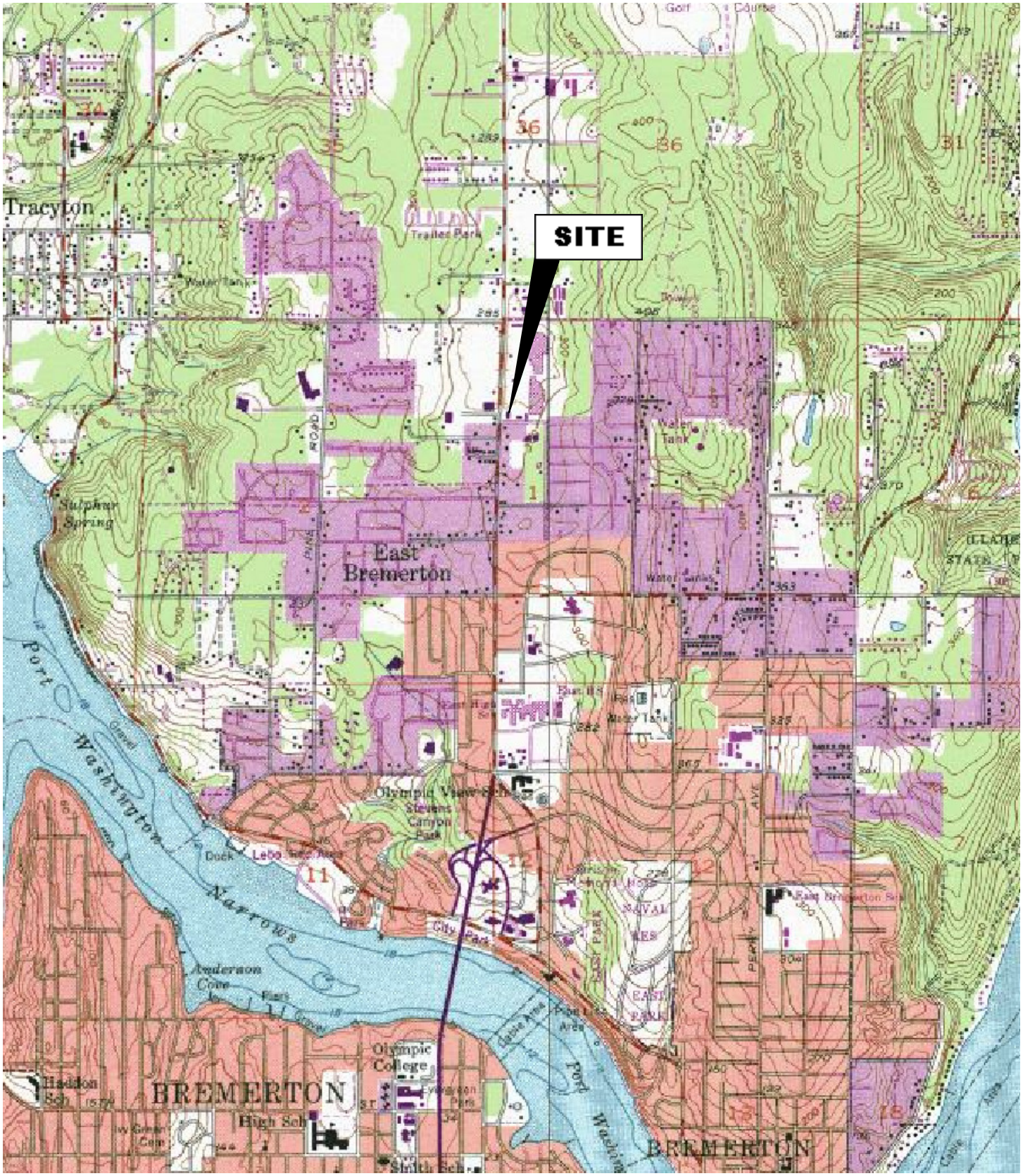
GRAPHS

Graph 1:	Vapor Extraction Remediation System – Mass Removal Trend
Graph 2:	Vapor Extraction Remediation System – Hydrocarbon Concentrations by Well

APPENDICES

Appendix A:	Laboratory Analytical Reports
Appendix B:	Field Data Sheets

FIGURES



Map Information: Maptech
Terrain Navigator–2nd Ed.–San Juan Island
Olympic Peninsula/Sea–Tac (WA)
42°36'10"N 122°37'42"W

environ strategy consultants, inc.
One Technology Drive, Suite B–123
Irvine, California 92618

N

0 2000

APPROX. SCALE: 1" = 2000'

FIGURE 1

SITE LOCATION MAP

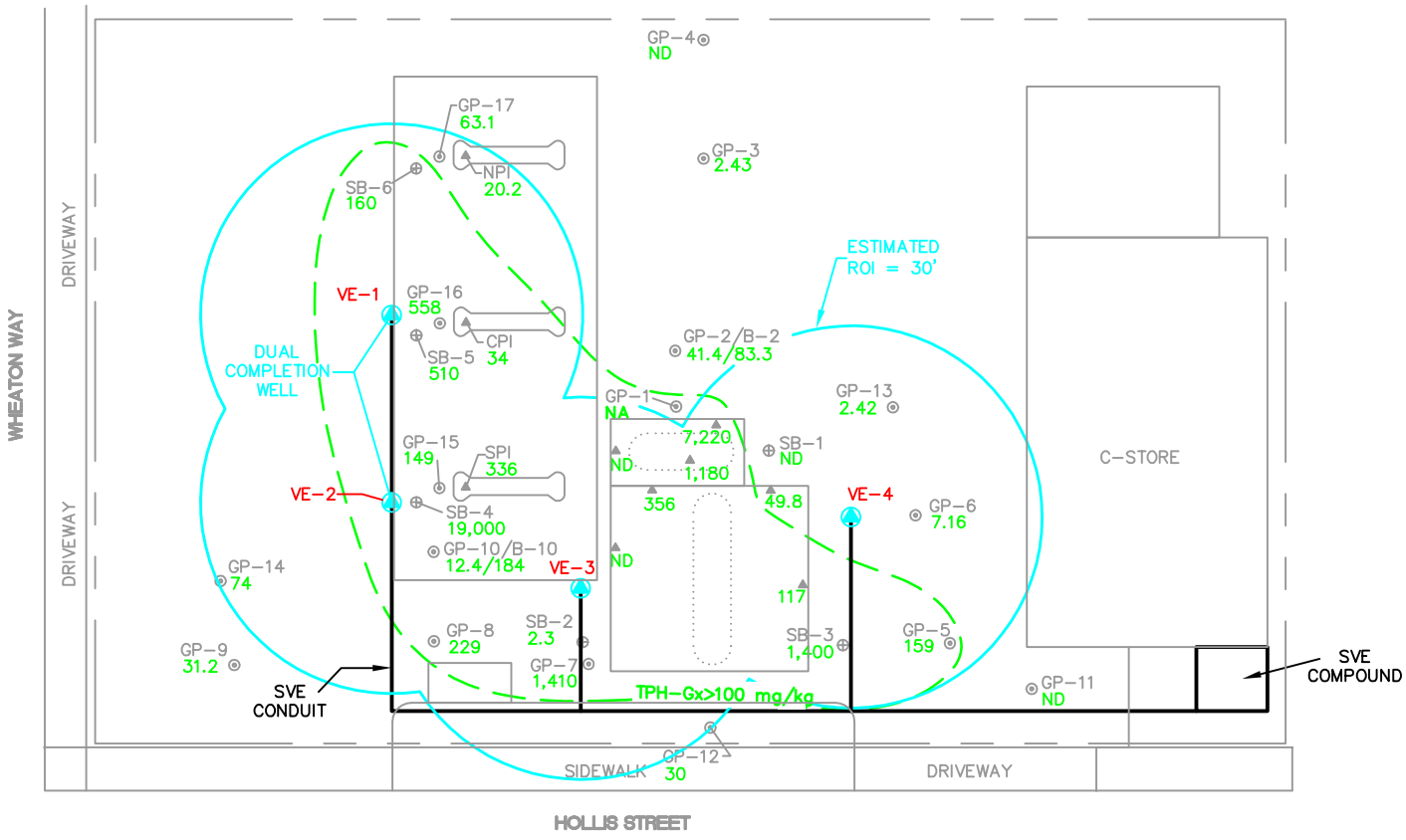
Pacific Convenience & Fuels
Site #01–352
4200 Wheaton Way
Bremerton, Washington

DATE
05/13/10

PROJECT NO.
623

FILE NO.
623F1–SLM

\\Data\data\01_Projects\01_Site Assessment Remediation\Pacific Convenience & Fuels\01-352 - Wheaton Way, Bremerton WA (#623)\Reports\Focused Phase II\Dwgs\623F1–SLM.dwg



LEGEND

SB-1 ⊕	Soil Boring (Environ Strategy, 2010)
GP-1 ⊙	Soil Boring (Clearwater, 1997)
▲	Verification Soil Sample (Clearwater, 1997)
TPH-Gx	Total Petroleum Hydrocarbons Quantified as Gasoline
	SVE Well with Estimated ROI of 30 Feet
ROI	Radius of Influence
SVE	Soil Vapor Extraction
mg/kg	Milligram per Kilogram
- - -	Approximate TPH-Gx Iso-Concentration Contour
▭	Underground Storage Tank
▭	Pump Island
74	Highest TPH-Gx level in subsurface soil (See Table 1 & Table 2 for additional details)
ND	Non-Detect

N

30 0 30

APPROXIMATE SCALE: 1" = 30'

environ strategy consultants, inc.

One Technology Drive, Suite B-123
Irvine, California 92618

FIGURE 2

SITE PLAN SHOWING
WELL LOCATIONS

Pacific Convenience & Fuels Site #352
4200 Wheaton Way
Bremerton, Washington

DATE
06/07/10

PROJECT NO.
623

FILE NO.
623F4-SVEC

TABLES

TABLE 1
Summary of Soil Vapor Extraction System Operational Data
Site 01-352
Bremerton, Washington
1 of 1

Date	Hour Meter Reading	Calculated Operational Hours	Operational Hours	# of Wells Online	Influent Vacuum (in H_2O)	System Combustion Temp (°F)	Temp below cat. Bed (°F)	Temp above cat. Bed (°F)	Flow (acfm)	Influent PID Reading (ppmV)	Effluent PID Reading (ppmV)	Hydrocarbon Mass Removed (lbs)	Hydrocarbon Removal Rate (lbs/day)	Remarks
2/28/2012	603,986		-	4	18	625	665	896	82	600	-	-	-	
3/14/2012	604,346	360	360	4	60	620	620	740	197	800	5	676	45	
3/30/2012	604,730	744	744	4	68	625	630	700	188	450	4	1,290	38	
4/10/2012	604,994	1,008	1,008	4	58	640	692	690	190	492	-	1,612	29	
5/15/2012	605,834	1,848	1,848	4	45	650	650	699	170	1,199	-	3,256	47	
5/30/2012	606,194	2,208	2,208	4	48	650	650	677	176	1,009	-	4,208	63	
6/19/2012	630,872	2,688	2,688	3	45	600	600	602	160	660	3	5,081	44	
6/30/2012	633,512	2,952	2,952	2	59	650	650	687	176	700	5	5,511	39	Wells #3 and #4 closed due to decreasing concentrations
7/17/2012	636,688	3,360	3,360	3	55	650	680	700	140	948	8.4	6,152	38	System found down due to power outage, storms in area
7/31/2012	636,688	3,696	3,696	2	59	650	650	687	176	400	9	6,694	39	
8/15/2012	637,404	4,056	4,056	3	65	650	650	699	90	1,200	-	7,047	24	
8/20/2012	638,122	4,176	4,176	3	48	650	650	677	176	1,678	-	7,461	83	System shutting down due to cat cell likely plugged

Notes and abbreviations:

Hydrocarbon removal rate and cumulative hydrocarbon removal were calculated using the following formula:

$$lbs = \frac{ppmv\ (60\ min/hr)\ (24\ hr/day)\ (acfm)\ (86\ lb/lb\text{-}mole)}{(1{,}000{,}000)\ (379\ ft^3/lb\text{-}mole)}$$

Where:
ppmv = average hydrocarbon concentration in parts per million by volume
ft/min = velocity or flow rate in standard cubic feet per minute
acfm = vapor flow rate in actual cubic feet per minute
86 lb/lb-mole = average molecular weight of gasoline
379 ft^3/lb-mole = average molar weight of air

- : zero
lbs: pounds
lbs/day: pounds per day
PID: photo-ionization detector calibrated to hexane
ppmv: parts per million by volume
acfm: actual cubic feet per minute
in H_2O: inches of water

TABLE 2
SVE Well Data
Site 01-352
Bremerton, Washington
1 of 1

	#1	Vac	Status	Flow	**#2**	Vac	Status	Flow	**#3**	Vac	Status	Flow	**#4**	Vac	Status	Flow
Date	(ppmv)	(H^2O")	(%)	(acfm)	(ppmv)	(H^2O")	(%)	(acfm)	(ppmv)	(H^2O")	(%)	(acfm)	(ppmv)	(H^2O")	(%)	(acfm)
02/28/12	230	12	100%	-	400	10	100%	-	130	11	100%	-	278	10	100%	-
03/14/12	1,220	29	100%	60	280	30	100%	60	380	25	100%	60	227	27	100%	60
03/30/12	1,007	28	100%	55	125	29	100%	45	270	30	100%	60	200	30	100%	58
04/10/12	1,262	31	100%	-	298	30	100%	-	272	22	100%	-	325	31	100%	-
05/15/12	296	32.5	100%	45	767	26	100%	40	638	26	100%	40	1,125	28.6	100%	45
05/30/12	250	36	100%	45	600	26	100%	45	555	26	100%	45	980	30	100%	44
06/19/12	692	34	100%	45	780	35	100%	40	400	34	50%	40	-	-	0%	-
06/30/12	680	54	100%	45	230	30	50%	45	-	-	0%	-	-	-	0%	-
07/17/12	220	42	100%	40	200	38	100%	40	85	34	50%	40	-	-	0%	-
07/31/12	280	54	100%	67	230	55	100%	59	-	-	0%	-	-	-	0%	-
08/15/12	306	52.5	100%	40	445	50	100%	40	500	50	100%	40	-	-	0%	-
08/20/12	2,065	36	100%	45	802	34	100%	45	462	35	100%	45	-	-	0%	-

Notes:

System start up on 02/28/2012

H^2O" = inches of water
ppmv = parts per million by volume, based on field photo-ionization detector readings
acfm = actual cubic feet per minute
1% LEL = 138 ppmv (approximately)
"-" = not measured
%: percent
Status: well status, percent open
Vac: vacuum

TABLE 3
SVE Influent and Effluent Analytical Data
Site 01-352
Bremerton, Washington
1 of 1

SYSTEM VAPOR EXTRACTION	EPA METHOD 8260				
INLET	**TPH-Gx**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**
Date	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
02/15/12	3,300,000	29,000	22,000	13,000	40,000
03/14/12	1,400,000	13,000	29,000	9,000	31,000
04/10/12	90,000	410	860	410	1,500
05/15/12	74,000	360	890	220	1,100
06/19/12	44,000	280	1,100	170	1,100
07/17/12	170,000	160	890	320	2,600
08/20/12	1,400,000	870	2,700	340	2,600

	EPA METHOD 8260				
OUTLET	**TPH-Gx**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**
Date	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
02/15/12	38,000	<100	110	<100	260
03/14/12	32,000	<100	<100	<100	<100
04/10/12	4,200	8.9	19	8.3	38
05/15/12	6,900	13	54	22	180
06/19/12	7,500	<10	<10	<10	17
07/17/12	5,100	13	22	<10	35
08/20/12	19,000	21	38	<10	37

Notes:

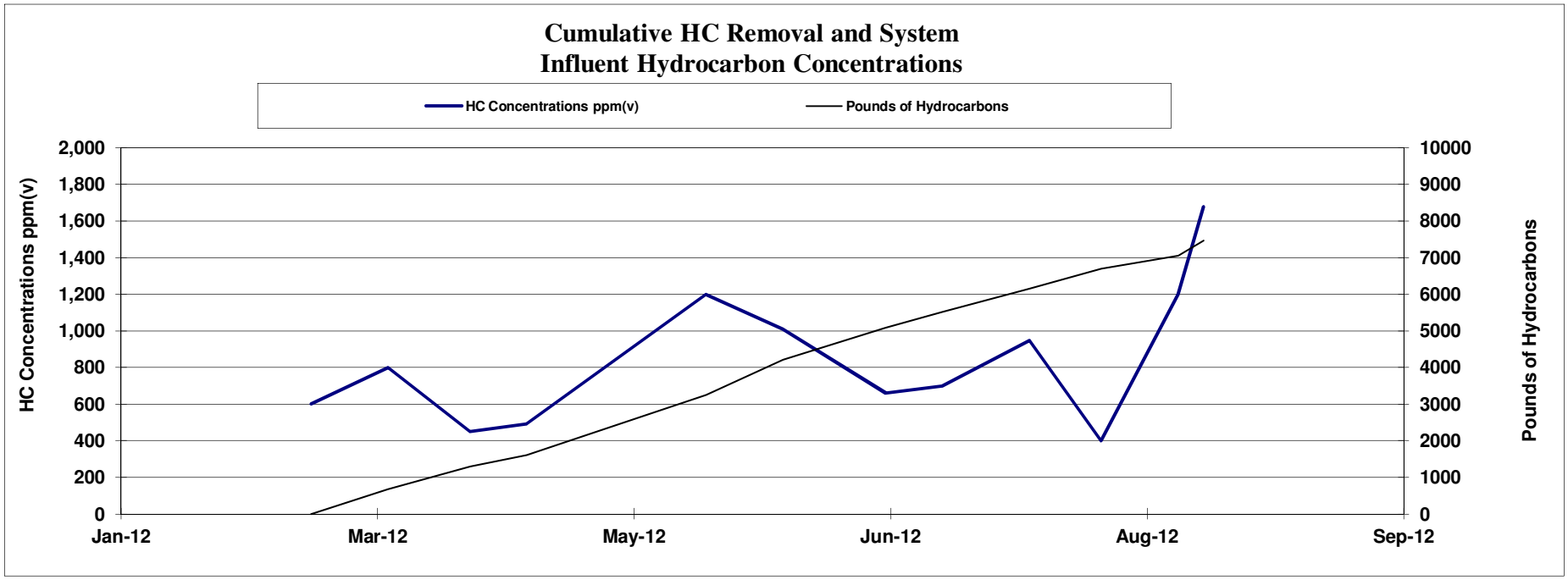
<100 = not detected at listed detection limit

µg/m^3 = micrograms per cubic meter

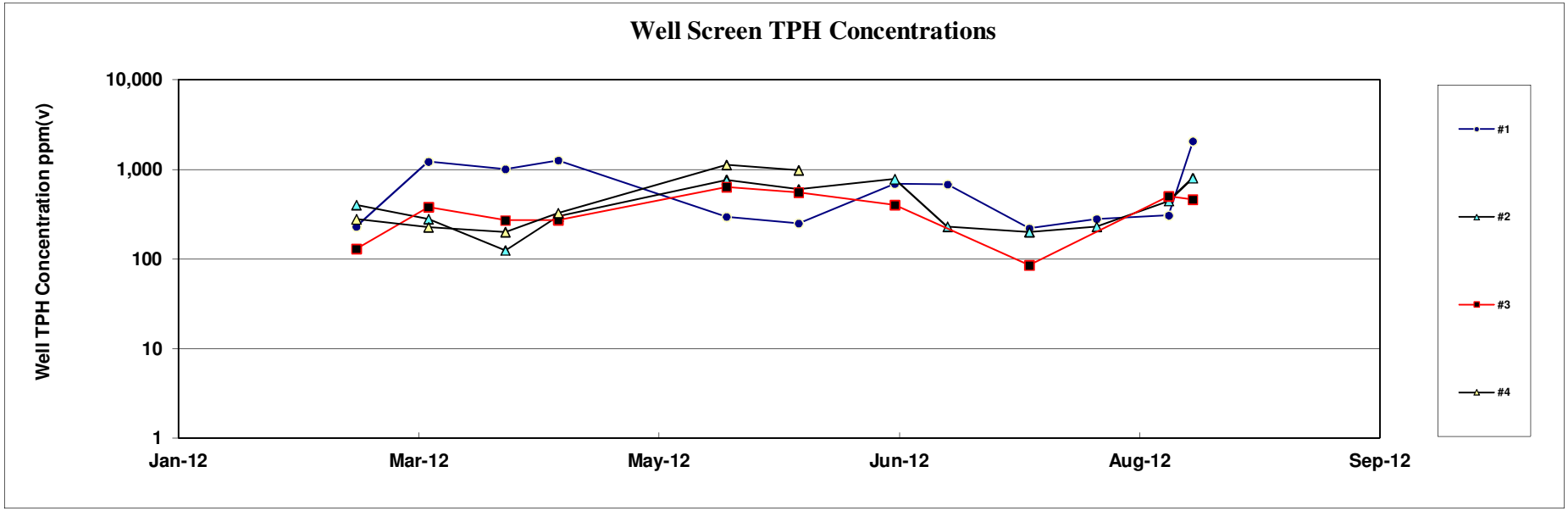
TPH-Gx: total petroleum hydrocarbons quantified as gasoline

GRAPHS

GRAPH 1
Vapor Extraction System - Mass Removal Trend
Site 01-352
Bremerton, Washington



GRAPH 2
Vapor Extraction System - Hydrocarbon Concentrations by Well
Site 01-352
Bremerton, Washington



APPENDIX A

Laboratory Analytical Reports

ESN NORTHWEST
Environmental Services Network

February 16, 2012

Dane Nygaard
Environ Strategy
1036 West Taft Avenue, Suite 200
Orange, CA 92865

Dear Mr. Nygaard:

Please find enclosed the analytical data report for the PCF-Site 352 Project in Bremerton, Washington. Soil vapor samples were analyzed for Gasoline by NWTPH-Gx and BTEX by Method 8260 on February 15, 2012.

The results of the analyses are summarized in the attached tables. All soil values are reported on a dry weight basis. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

ESN Northwest appreciates the opportunity to have provided analytical services to you for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec

Michael A. Korosec
President

1210 Eastside Street SE, Suite 200 ■ Olympia, Washington 98501 ■ 360.459.4670 ■ FAX 360.459.3432
Web Site: *www.esnnw.com* E-Mail: *info@esnnw.com*

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy
PCF-SITE 352 PROJECT
Client Project #623
Bremerton, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Gasoline Range Organics, BTEX in Soil Vapor by Method NWTPH-Gx/8260

Sample Number	Date Analyzed	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Gasoline Range Organics (ug/L)	Surrogate Recovery (%)
Method Blank	2/15/2012	nd	nd	nd	nd	nd	113
LCS	2/15/2012	104%	110%	103%	103%	91%	106
LCSD	2/15/2012	93%	94%	94%	91%	---	106
Inlet-021412	2/15/2012	**29**	**22**	**13**	**40**	**3300**	116
Out-021412	2/15/2012	nd	**0.11**	nd	**0.26**	**38**	115
Out-021412 Duplicate	2/15/2012	nd	**0.11**	nd	**0.26**	**38**	116
Reporting Limits		0.1	0.1	0.1	0.1	10	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromoflurorbenzene) & LCS: 65% TO 135%

ESN NORTHWEST, INC. Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: ENVIRON STRATEGY

ADDRESS: 1036 W TAFT AVE, STE 200, ORANGE CA 92865

PHONE (714) 919-6500 FAX: (714) 919-6501

CLIENT PROJECT #: 623 PROJECT MANAGER: DANE NYGAARD

DATE: 2/14/12 PAGE 1 OF 1

PROJECT NAME: PCE-SITE 352

LOCATION: BREMERTON, WA

COLLECTOR: C. SWIFT DATE OF COLLECTION 2/14

Sample Number	Depth	Time	Sample Type	Container Type	TPH-HCID	TPH - DIESEL & OIL	TPH - GASOLINE	BTEX	VOC 8260CL	VOC 8260	SemiVol 8270	PAH's 8270	PCB's 8082	CL Pesticides 8081	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos-PLM	GRO Suite	DRO Suite	WO Suite	NOTES	Total Number of Containers	Laboratory Note Number
1. INLET-021412		4:00	AIR	TEDLAR		X		X														E-MAIL RESULTS TO: dnygaard@environstrategy.com charless@pnecorp.com		
2. OUT-021412		4:10	AIR	TEDLAR		X		X																
3.																								
4.																								
5.																								
6.																								
7.																								
8.																								
9.																								
10.																								
11.																								
12.																								
13.																								
14.																								
15.																								
16.																								
17.																								
18.																								

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
		John Wolfe	2/14/12 5:45
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ ESN DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: (24 HR) 48 HR 5 DAY

ESN NORTHWEST
Environmental Services Network

March 19, 2012

Dane Nygaard
Environ Strategy
1036 West Taft Avenue, Suite 200
Orange, CA 92865

Dear Mr. Nygaard:

Please find enclosed the analytical data report for the PCF-Site 352 Project in Bremerton, Washington. One soil vapor sample was analyzed for Gasoline by NWTPH-Gx, BTEX by Method 8260, and Pb by Method 6020 on March 16, 2012.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

ESN Northwest appreciates the opportunity to have provided analytical services to you for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec

Michael A. Korosec
President

1210 Eastside Street SE, Suite 200 ■ Olympia, Washington 98501 ■ 360.459.4670 ■ FAX 360.459.3432
Web Site: *www.esnnw.com* E-Mail: *info@esnnw.com*

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy Consultants
PCF-SITE 352 PROJECT
Client Project #623
Bremerton, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Gasoline Range Organics, BTEX in Soil Vapor by Method NWTPH-Gx/8260

Sample Number	Date Analyzed	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Gasoline Range Organics (ug/L)	Surrogate Recovery (%)
Method Blank	3/16/2012	nd	nd	nd	nd	nd	95
LCS	3/16/2012	90%	95%	94%	87%	101%	90
LCSD	3/16/2012	90%	95%	96%	91%	---	90
IN-031412	3/16/2012	**13**	**29**	**9.0**	**31**	**1400**	99
OUT-031412	3/16/2012	nd	nd	nd	nd	**32**	103
Reporting Limits		0.1	0.1	0.1	0.1	10	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromoflurorbenzene) & LCS: 65% TO 135%

ESN NORTHWEST, INC. | Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: Environ Strategy

ADDRESS: 1036 W Taft Suite 200 Orange CA 92865

PHONE: 714-919-6500 FAX: 714-919-6501

CLIENT PROJECT #: 623 PROJECT MANAGER: Dan Mayer

DATE: 3/14/12 PAGE 1 OF 1

PROJECT NAME: PCF-Site 352

LOCATION: Bremerton WA

COLLECTOR: C Smith DATE OF COLLECTION 3/14/12

Sample Number	Depth	Time	Sample Type	Container Type	TPH-HCID	TPH - DIESEL & OIL	TPH - GASOLINE	BTEX	VOC 8260CL	VOC 8260	SemiVol 8270	PAH's 8270	PCB's 8082	CL Pesticides 8081	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos-PLM	GRO Suite	DRO Suite	WO Suite				NOTES	Total Number of Containers	Laboratory Note Number
1. IN-031412		3:00	A	1			X	X																			
2.																											
3. Out-031412		3:10	A	1			X	X																			
4.																											
5.																											
6.																											
7.																											
8.																											
9.																											
10.																											
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13.																											
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15.																											
16.																											
17.																											
18.																											

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C Smith	3/13/12 9:20	John Wolfs	3/15/12 9:30
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ ESN DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: 24 HR (circled) 48 HR 5 DAY

ESN NORTHWEST
Environmental Services Network

April 18, 2012

Dane Nygaard
Environ Strategy
1036 West Taft Avenue, Suite 200
Orange, CA 92865

Dear Mr. Nygaard:

Please find enclosed the analytical data report for the PCF-Site 352 Project in Bremerton, Washington. Air samples were analyzed for Gasoline by NWTPH-Gx and BTEX by Method 8260 on April 11, 2012.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

ESN Northwest appreciates the opportunity to have provided analytical services to you for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec

Michael A. Korosec
President

1210 Eastside Street SE, Suite 200 ■ Olympia, Washington 98501 ■ 360.459.4670 ■ FAX 360.459.3432
Web Site: *www.esnnw.com* E-Mail: *info@esnnw.com*

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy
PCF-SITE 352 PROJECT
Client Project #623
Bremerton, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analyses of Volatile Organic Componds in Soil Vapor by Method 8260

Sample ID	Molecular	Reporting	MB	LCS	LCSD	Inlet 4102012	Outlet 4102012
Date Sampled	Weight	Limits	04/11/12	04/11/12	04/11/12	04/10/12	04/10/12
Date Analyzed	g	ug/m3	04/11/12	04/11/12	04/11/12	04/11/12	04/11/12
Benzene	78.11	0.1	nd	97%	97%	**410**	**8.9**
Toluene	92.13	0.1	nd	110%	96%	**860**	**19**
Ethylbenzene	106.2	0.1	nd	103%	104%	**410**	**8.3**
Xylenes	106.2	0.1	nd	98%	97%	**1,500**	**38**
Gasoline	---	10	nd	93%	---	**90,000**	**4,200**
Surrogate recoveries							
Dibromofluoromethane			108%	100%	101%	94%	97%
Toluene-d8			99%	93%	93%	119%	108%
4-Bromofluorobenzene			110%	95%	96%	105%	100%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

ESN NORTHWEST, INC. | Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: Kennedy Stanley

ADDRESS: 1215 C St, Ste 200, Anacortes, WA 98221

PHONE: 714-719-6500 FAX: 714-545-5501

CLIENT PROJECT #: 623 PROJECT MANAGER: D. Maynard

DATE: 4/11/12 PAGE 1 OF 1

PROJECT NAME: RF-5412

LOCATION: Renton, WA

COLLECTOR: C Smith DATE OF COLLECTION 4/11/12

Sample Number	Depth	Time	Sample Type	Container Type	TPH-HCID	TPH - DIESEL & OIL	TPH - GASOLINE	BTEX	VOC 8260CL	VOC 8260	SemiVol 8270	PAH's 8270	PCB's 8082	CL Pesticides 8081	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos-PLM	GRO Suite	DRO Suite	WO Suite	NOTES	Total Number of Containers	Laboratory Note Number
1. I-4/10/12		7:30	A	T/L				X	X															
2.																								
3. Dup-4/10/12		7:10	A	T/L				X	X															
4.																								
5.																								
6.																								
7.																								
8.																								
9.																								
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	4/11/12		4-11-12

SAMPLE DISPOSAL INSTRUCTIONS

☐ ESN DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: 24 HR 48 HR 5 DAY

ESN NORTHWEST
Environmental Services Network

May 21, 2012

Dane Nygaard
Environ Strategy
1036 West Taft Avenue, Suite 200
Orange, CA 92865

Dear Mr. Nygaard:

Please find enclosed the analytical data report for the PCF-Site 352 Project in Bremerton, Washington. Air samples were analyzed for Gasoline by NWTPH-Gx and BTEX by Method 8260 on May 16, 2012.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

ESN Northwest appreciates the opportunity to have provided analytical services to you for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Stephen Loague
Lab Manager

1210 Eastside Street SE, Suite 200 ■ Olympia, Washington 98501 ■ 360.459.4670 ■ FAX 360.459.3432
Web Site: *www.esnnw.com* E-Mail: *info@esnnw.com*

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy
PCF #352 PROJECT
Client Project #623
Bremerton, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Gasoline Range Organics, BTEX in Water by Method NWTPH-Gx/8260

Sample Number	Date Analyzed	Benzene ug/m3	Toluene ug/m3	Ethylbenzene ug/m3	Xylenes ug/m3	Gasoline Range Organics ug/m3	Surrogate Recovery (%)
Method Blank	5/16/2012	nd	nd	nd	nd	nd	115
LCS	5/16/2012	90%	105%	90%	98%	107%	96
LCSD	5/16/2012	85%	84%	90%	87%	---	100
Inlet 05152012	5/16/2012	**360**	**890**	**220**	**1100**	**74,000**	102
Outlet 05152012	5/16/2012	**13**	**54**	**22**	**180**	**6900**	113
Reporting Limits		10.0	10.0	10.0	10.0	100	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromoflurorbenzene) & LCS: 65% TO 135%

ESN NORTHWEST, INC. | Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: Environ Strategy

ADDRESS: 1016 W. 7th, Suite 200, Oxnard, CA 93065

PHONE: 714-715-6700 FAX: 714-515-6701

CLIENT PROJECT #: 621 PROJECT MANAGER: Dan Nygard

DATE: 5/16/12 PAGE ____ OF ____

PROJECT NAME: PCF # 752

LOCATION: Remodeling, CA

COLLECTOR: C. Swift DATE OF COLLECTION 5/16/12

Sample Number	Depth	Time	Sample Type	Container Type	TPH-HCID	TPH - DIESEL & OIL	TPH - GASOLINE	BTEX	VOC 8260/CL	VOC 8260	SemiVol 8270	PAH's 8270	PCB's 8082	CL Pesticides 8081	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos-PLM	GRO Suite	DRO Suite	WO Suite	NOTES	Total Number of Containers	Laboratory Note Number
1. Tank 05162012			Air	Tedlar			X	X																
2.																								
3. Ambient 05162012			Air	Tedlar			X	X																
4.																								
5.																								
6.																								
7.																								
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RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ ESN DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: 24 HR 48 HR 5 DAY

ESN NORTHWEST
Environmental Services Network

June 21, 2012

Dane Nygaard
Environ Strategy
1036 West Taft Avenue, Suite 200
Orange, CA 92865

Dear Mr. Nygaard:

Please find enclosed the analytical data report for the PCF Site #352 Project in Bremerton, Washington. Soil vapor samples were analyzed for Gasoline by NWTPH-Gx and BTEX by Method 8260 on June 20, 2012.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

ESN Northwest appreciates the opportunity to have provided analytical services to you for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec
President

1210 Eastside Street SE, Suite 200 ■ Olympia, Washington 98501 ■ 360.459.4670 ■ FAX 360.459.3432
Web Site: *www.esnnw.com* E-Mail: *info@esnnw.com*

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy
PCF #352 PROJECT
Client Project #623
Bremerton, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Gasoline Range Organics, BTEX in Soil Vapor by Method NWTPH-Gx/8260

Sample Number	Date Analyzed	Benzene ug/m3	Toluene ug/m3	Ethylbenzene ug/m3	Xylenes ug/m3	Gasoline Range Organics ug/m3	Surrogate Recovery (%)
Method Blank	6/20/2012	nd	nd	nd	nd	nd	120
LCS	6/20/2012	102%	100%	107%	108%	108%	99
LCSD	6/20/2012	100%	97%	101%	102%	---	97
Inlet 05152012	6/20/2012	**280**	**1100**	**170**	**1100**	**44,000**	115
Outlet 05152012	6/20/2012	nd	nd	nd	**17**	**7500**	113
Reporting Limits		10.0	10.0	10.0	10.0	100	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromoflurorbenzene) & LCS: 65% TO 135%

ESN NORTHWEST, INC. Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: Environ Strategy

ADDRESS: 1076 W. 7th, Suite 200, Oxnard, CA 93065

PHONE: 714-719-6300 FAX: 714-919-6301

CLIENT PROJECT #: 623 PROJECT MANAGER: Dennis Haygood

DATE: 6/20/12 PAGE _____ OF _____

PROJECT NAME: RCF II 352

LOCATION: Bremerton, WA

COLLECTOR: C. Swift DATE OF COLLECTION 6/13/12

Sample Number	Depth	Time	Sample Type	Container Type	TPH-HCID	TPH - DIESEL & OIL	TPH - GASOLINE	BTEX	VOC 8260CL	VOC 8260	SemiVol 8270	PAH's 8270	PCB's 8082	CL Pesticides 8081	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos-PLM	GRO Suite	DRO Suite	WO Suite	NOTES	Total Number of Containers	Laboratory Note Number
1. I-1-061312		12:00	A	Tedlar			X	X																
2.																								
3. I-2-061312		12:15	A	Tedlar			X	X																
4.																								
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RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ ESN DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: (24 HR) 48 HR 5 DAY

ESN NORTHWEST
Environmental Services Network

July 18, 2012

Dane Nygaard
Environ Strategy
1036 West Taft Avenue, Suite 200
Orange, CA 92865

Dear Mr. Nygaard:

Please find enclosed the analytical data report for the PCF Site 352 Project located in Bremerton, Washington. Soil vapor samples were analyzed for Gasoline by NWTPH-Gx and BTEX by Method 8260 on July 18, 2012.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

ESN Northwest appreciates the opportunity to have provided analytical services to you for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec
President

1210 Eastside Street SE, Suite 200 ■ Olympia, Washington 98501 ■ 360.459.4670 ■ FAX 360.459.3432
Web Site: *www.esnnw.com* E-Mail: *info@esnnw.com*

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy
PCF #352 PROJECT
Client Project #623
Bremerton, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Gasoline Range Organics, BTEX in Soil Vapor by Method NWTPH-Gx/8260

Sample Number	Date Analyzed	Benzene ug/m3	Toluene ug/m3	Ethylbenzene ug/m3	Xylenes ug/m3	Gasoline Range Organics ug/m3	Surrogate Recovery (%)
Method Blank	7/18/2012	nd	nd	nd	nd	nd	111
LCS	7/18/2012	108%	116%	112%	123%	92%	86
LCSD	7/18/2012	92%	96%	96%	103%	---	99
Outlet	7/18/2012	**13**	**22**	nd	**35**	**5100**	106
Inlet	7/18/2012	**160**	**890**	**320**	**2600**	**170,000**	108
Reporting Limits		10	10	10	10	100	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromoflurorbenzene) & LCS: 65% TO 135%

ESN NORTHWEST, INC. | Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: Farallon Stanley

ADDRESS: 1026 W. Taft, Suite 201, Orange CA 92865

PHONE: 714-515-6200 FAX: 714-515-6101

CLIENT PROJECT #: 623 PROJECT MANAGER: Ann Wycoff

DATE: 7/17/12 PAGE ____ OF ____

PROJECT NAME: PCF # 352

LOCATION: Bremerton, WA

COLLECTOR: C. Smith DATE OF COLLECTION 07/17/12

Sample Number	Depth	Time	Sample Type	Container Type	TPH-HCID	TPH - DIESEL & OIL	TPH - GASOLINE	BTEX	VOC 8260CL	VOC 8260	SemiVol 8270	PAH's 8270	PCB's 8082	CL Pesticides 8081	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos-PLM	GRO Suite	DRO Suite	WO Suite	NOTES	Total Number of Containers	Laboratory Note Number
1. Tank-07172012		6:05	A	1			X	X																
2.																								
3. Dock-07172012		6:30	A	1			X	X																
4.																								
5.																								
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SAMPLE DISPOSAL INSTRUCTIONS

☐ ESN DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: (24 HR) 48 HR 5 DAY

ESN NORTHWEST
Environmental Services Network

August 24, 2012

Dan Nygaard
Environ Strategy
1036 West Taft Avenue, Suite 200
Orange, CA 92865

Dear Mr. Nygaard:

Please find enclosed the analytical data report for the PCF Site 352 Project located in Bremerton, Washington. Soil vapor samples were analyzed for Gasoline by NWTPH-Gx and VOC's by Method 8260 on August 23, 2012.

The results of the analyses are summarized in the attached tables. All soil values are reported on a dry weight basis. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

ESN Northwest appreciates the opportunity to have provided analytical services to you for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A Korosec

Michael A. Korosec
President

1210 Eastside Street SE, Suite 200 ■ Olympia, Washington 98501 ■ 360.459.4670 ■ FAX 360.459.3432
Web Site: *www.esnnw.com* E-Mail: *info@esnnw.com*

ESN NORTHWEST CHEMISTRY LABORATORY

Environ Strategy
PCF #352 PROJECT
Client Project #623
Bremerton, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Gasoline Range Organics, BTEX in Soil Vapor by Method NWTPH-Gx/8260

Sample Number	Date Analyzed	Benzene ug/m3	Toluene ug/m3	Ethylbenzene ug/m3	Xylenes ug/m3	Gasoline Range Organics ug/m3	Surrogate Recovery (%)
Method Blank	8/23/2012	nd	nd	nd	nd	nd	102
LCS	8/23/2012	112%	113%	113%	120%	87%	94
LCSD	8/23/2012	109%	110%	112%	118%	---	90
Outlet	8/23/2012	**21**	**38**	nd	**37**	**19,000**	106
Outlet Duplicate	8/23/2012	**20**	**43**	nd	**41**	**19,000**	94
Inlet	8/23/2012	**870**	**2700**	**340**	**2600**	**1,400,000**	102
Reporting Limits		10	10	10	10	100	

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromoflurorbenzene) & LCS: 65% TO 135%

ESN NORTHWEST, INC. | Environmental Services Network

CHAIN-OF-CUSTODY RECORD

CLIENT: Environ Stanley

ADDRESS: 1076 W Taft Ave, Orange, CA 92865

PHONE: 714-919-6500 FAX: 714-919-6501

CLIENT PROJECT #: 623 PROJECT MANAGER: Dean Nygaard

DATE: 8/21/12 PAGE ____ OF ____

PROJECT NAME: PCF-54 352

LOCATION: Burnaby WA

COLLECTOR: Chuck Sia DATE OF COLLECTION 8/21/12

Sample Number	Depth	Time	Sample Type	Container Type	TPH-HCID	TPH - DIESEL & OIL	TPH - GASOLINE	BTEX	VOC 8260/CL	VOC 8260	SemiVol 8270	PAH's 8270	PCB's 8082	CL Pesticides 8081	RCRA 8 Metals	MTCA 5 Metals	Pb	Asbestos-PLM	GRO Suite	DRO Suite	WO Suite	NOTES	Total Number of Containers	Laboratory Note Number
1. Inlet-082112		7:00	A	T/L			X	X																
2.																								
3. Outlet-082112		7:15	A	T/L			X	X																
4.																								
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RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ ESN DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Turn Around Time: 24 HR 48 HR 5 DAY

APPENDIX B

Field Data Sheets

2/28/12 (1)

(46)

Vapor Extraction System Data Sheet

Station No: Site #852
Max Flow Rate (scfm): 250

Voc Out: 2-10 ppmV

City: Bremerton, WA
Min. Op. Temp: 625 F

Date	# of Wells (Zones) On-Line	Cumulative Operating Hours	Influent Vacuum (In. H_2O)	System Flowrate (acfm)	Total Well Flow (acfm)	Average Well Influent Conc. ppm(v)	Average System Influent Conc. ppm(v)	System Influent O_2 Conc. %	Flow Pres / Vac (In. H_2O)	Flow Temp. (°F)	Adsorber Inlet Temp. (°F)	Effluent (A) Conc. ppm(V)	Effluent (B) Conc. ppm(V)	Effluent (C) Conc. ppm(V)	System Combustion Temp (°F)	Temp. Below Cat. Bed (°F)	Temp. Above Cat. Bed (°F)
2/28/12	4	603586	18		82	600	600		18	58					625	665	856

240UAC-

Vapor Extraction System Maintenance Service Record

Date	Electric Meter Reading	Blower Amperage	Changed Process Filter	Changed Dilution Filter	Test Safety Interlock System	Replaced V-Belts	Changed Blower Oil	Replaced UV Scanner or Flame	Replaced Chart Pens or Paper	Inspect Fire Suppression Device	Carbon Change-Out	Automatic System Shut-Down Test	Calibrate VOC Monitor	Holding Tank Serviced	Comments
2/28/12	11705	13.5	N/A	N/A	OK	OK	2/2/12	N/A	N/A	OK	N/A	OK	N/A	N/A	

Notes: 360-627-8213 - Station Number

Inlet Line = 3720 fpm
Dilution 22% OPEN

Line 1 = 1560 fpm @ 12" Top
Line 2 = 1612 fpm @ 10"
Line 3 = 1580 fpm @ 11"
Line 4 = 1545 fpm @ 10" Bottom

2/28/12 ②

Vapor Extraction Individual Well Data Sheet

Station No.: SL# 352

City: Bremerton, WA

	Vapor System			Line 1			Line 2			Line 3		
	Pre-Dilution	Vac	Flow		Vac	Well Status		Vac	Well Status		Vac	Well Status
Date	(ppmv)	(H_20")	(scfm)	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)
2/28/12	600	18	82	230	12	100%	400	10"	100%	230	11"	100%

	Line 4											
		Vac	Well Status		Vac	Well Status		Vac	Well Status		Vac	Well Status
Date	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)
2/28/12	278	10"	100%									

		Vac	Well Status		Vac	Well Status		Vac	Well Status		Vac	Well Status
Date	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)

		Vac	Well Status		Vac	Well Status		Vac	Well Status		Vac	Well Status
Date	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)

		Vac	Well Status		Vac	Well Status		Vac	Well Status		Vac	Well Status
Date	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)	(ppmv)	(H_20")	(on / off)

Page_______ Of _______

Vapor Extraction System Data Sheet

Station No: PCF #352
Max Flow Rate (scfm): 2500 cfm
Voc Out: 5
City: Bismarck
Min. Op. Temp: 600F

Date	# of Wells (Zones) On-Line	Cumulative Operating Hours	Influent Vacuum (In. H_2O)	System Flowrate (acfm)	Total Well Flow (acfm)	Average Well Influent Conc. ppm(v)	Average System Influent Conc. ppm(v)	System Influent O_2 Conc. %	Flow Pres / Vac (In. H_2O)	Flow Temp. (°F)	Adsorber Inlet Temp. (°F)	Effluent (A) Conc. ppm(V)	Effluent (B) Conc. ppm(V)	Effluent (C) Conc. ppm(V)	System Combustion Temp (°F)	Temp. Below Cat. Bed (°F)	Temp. Above Cat. Bed (°F)
3/14/12	4	7578	60	177								800	5		620	628	740
#1				60		1220			29								
#2			~~30~~	60		280			30								
#3			~~28~~	60		350			25								
#4			28	60		227			27								

Vapor Extraction System Maintenance Service Record

Date	Electric Meter Reading	Blower Amperage	Changed Process Filter	Changed Dilution Filter	Test Safety Interlock System	Replaced V-Belts	Changed Blower Oil	Replaced UV Scanner or Flame	Replaced Chart Pens or Paper	Inspect Fire Suppression Device	Carbon Change-Out	Automatic System Shut-Down Test	Calibrate VOC Monitor	Holding Tank Serviced	Comments

Notes: T-Velocity = 9750 ft/m
#1 = 2200 #4 = 2940
#2 = 1550
#3 = 2180
#4 = 1880

Velocity Ratios

Vapor Extraction System Data Sheet

Station No: PCF #352
Max Flow Rate (scfm): 250 Cfm

Voc Out: 4

City: Bremerton
Min. Op. Temp: 600

Date	# of Wells (Zones) On-Line	Cumulative Operating Hours	Influent Vacuum (In. H_2O)	System Flowrate (acfm)	Total Well Flow (acfm)	Average Well Influent Conc. ppm(v)	Average System Influent Conc. ppm(v)	System Influent O_2 Conc. %	Flow Pres / Vac (In. H_2O)	Flow Temp. (°F)	Adsorber Inlet Temp. (°F)	Effluent (A) Conc. ppm(V)	Effluent (B) Conc. ppm(V)	Effluent (C) Conc. ppm(V)	System Combustion Temp (°F)	Temp. Below Cat. Bed (°F)	Temp. Above Cat. Bed (°F)
3/30/12	4	61141	68	188	188							450	4		625	600	700
#1			[redacted]	55		1007			28								
#2				45		125			29								
#3				60		270			30								
#4				58		200			20								

Vapor Extraction System Maintenance Service Record

Date	Electric Meter Reading	Blower Amperage	Changed Process Filter	Changed Dilution Filter	Test Safety Interlock System	Replaced V-Belts	Changed Blower Oil	Replaced UV Scanner or Flame	Replaced Chart Pens or Paper	Inspect Fire Suppression Device	Carbon Change-Out	Automatic System Shut Down Test	Calibrate VOC Monitor	Holding Tank Serviced	Comments

Notes: Velocity = Total Inlet = 9875 cfm
#1 = 2227
#2 = 1845
#3 = 2000
#4 = 1500

Vapor Extraction System Data Sheet

Station No: PCF #352 | Voc Out: 8 | City: Bremerton

Max Flow Rate (scfm): 250 cfm | Min. Op. Temp: 600

Date	# of Wells (Zones) On-Line	Cumulative Operating Hours	Influent Vacuum (In. H_2O)	System Flowrate (acfm)	Total Well Flow (acfm)	Average Well Influent Conc. ppm(v)	Average System Influent Conc. ppm(v)	System Influent O_2 Conc. %	Flow Pres / Vac (In. H_2O)	Flow Temp. (°F)	Adsorber Inlet Temp. (°F)	Effluent (A) Conc. ppm(V)	Effluent (B) Conc. ppm(V)	Effluent (C) Conc. ppm(V)	System Combustion Temp (°F)	Temp. Below Cat. Bed (°F)	Temp. Above Cat. Bed (°F)
4/10/12	4	61410	58	150	150		492								640	692	650
#1							1262		31								
#2							258		30								
#3							272		22								
#4							325		31								

Vapor Extraction System Maintenance Service Record

Date	Electric Meter Reading	Blower Amperage	Changed Process Filter	Changed Dilution Filter	Test Safety Interlock System	Replaced V-Belts	Changed Blower Oil	Replaced UV Scanner or Flame	Replaced Chart Pens or Paper	Inspect Fire Suppression Device	Carbon Change-Out	Automatic System Shut Down Test	Calibrate VOC Monitor	Holding Tank Serviced	Comments
4/10/12		14.5			OK	OK		—	—	—	—	OK	—	—	

Notes: Velocity = Total Inlet = 9800 cfm

#1 = 2200

#2 = 1500

#3 = 2010

#4 = 1975

Vapor Extraction System Data Sheet

Station No: PCF#352
Max Flow Rate (scfm): 250 CFM

Voc Out: 11.6

City: BREMERTON, WA
Min. Op. Temp: 600 F

Date	# of Wells (Zones) On-Line	Cumulative Operating Hours	Influent Vacuum (In. H_2O)	System Flowrate (acfm)	Total Well Flow (acfm)	Average Well Influent Conc. ppm(v)	Average System Influent Conc. ppm(v)	System Influent O_2 Conc. %	Flow Pres / Vac (In. H_2O)	Flow Temp. (°F)	Adsorber Inlet Temp. (°F)	Effluent (A) Conc. ppm(V)	Effluent (B) Conc. ppm(V)	Effluent (C) Conc. ppm(V)	System Combustion Temp (°F)	Temp. Below Cat. Bed (°F)	Temp. Above Cat. Bed (°F)
05/15/2012	4	622448	45	170	45	1199									650	650	699
#1			32.5	45		296											
#2			26	40		767											
#3			26	40		638											
#4			28.6	45		1125											
05/30/2012	4	622808	48	176		1009									650	650	677
#1			36	45		250											
#2			26	45		600											
#3			26	45		555											
#4			30	44		980											

Vapor Extraction System Maintenance Service Record

Date	Electric Meter Reading	Blower Amperage	Changed Process Filter	Changed Dilution Filter	Test Safety Interlock System	Replaced V-Belts	Changed Blower Oil	Replaced UV Scanner or Flame	Replaced Chart Pens or Paper	Inspect Fire Suppression Device	Carbon Change-Out	Automatic System Shut-Down Test	Calibrate VOC Monitor	Holding Tamk Serviced	Comments
05/15/2012		14.6	OK	OK	OK	NA	NA	NA	NA	OK	NA	OK	NA	NA	
05/30/2012		14.2	OK	OK	OK	NA	NA	NA	NA	OK	NA	OK	NA	NA	

Notes: ON MAY 15, 2012 AIR SAMPLES WERE COLLECTED FROM INLET/OUTLET PORTS TAKEN TO ESN LABORATORIES OLYMPIA, WA
ON MAY 30, 2012 THE SYSTEM WAS OPERATING AT TEMPERATURE CONCENTRATIONS LOWER, WATER IN KNOCKOUT TANK

Vapor Extraction System Data Sheet

Station No: PCF#352
Max Flow Rate (scfm): 250 CFM

Voc Out: 11.6

City: BREMERTON, WA
Min. Op. Temp: 600 F

Date	# of Wells (Zones) On-Line	Cumulative Operating Hours	Influent Vacuum (In. H_2O)	System Flowrate (acfm)	Total Well Flow (acfm)	Average Well Influent Conc. ppm(v)	Average System Influent Conc. ppm(v)	System Influent O_2 Conc. %	Flow Pres / Vac (In. H_2O)	Flow Temp. (°F)	Adsorber Inlet Temp. (°F)	Effluent (A) Conc. ppm(V)	Effluent (B) Conc. ppm(V)	Effluent (C) Conc. ppm(V)	System Combustion Temp (°F)	Temp. Below Cat. Bed (°F)	Temp. Above Cat. Bed (°F)
06/19/2012	4	63087/8	45	160		660						3			600	600	602
#1	100%		34	45	40	692	400										
#2	100%		35	40	38	780	560										
#3	50%		34	40	40	800	630										
#4	closed																
06/30/2012	4	63351/2	59	176		700						5			650	650	687
#1	100%		54	45		680											
#2	50%		30	45		230											
#3	closed		0	0													
#4	closed		0	0													

Vapor Extraction System Maintenance Service Record

Date	Electric Meter Reading	Blower Amperage	Changed Process Filter	Changed Dilution Filter	Test Safety Interlock System	Replaced V-Belts	Changed Blower Oil	Replaced UV Scanner or Flame	Replaced Chart Pens or Paper	Inspect Fire Suppression Device	Carbon Change-Out	Automatic System Shut-Down Test	Calibrate VOC Monitor	Holding Tamk Serviced	Comments
06/19/2012		14.5	OK	OK	OK	NA	NA	NA	NA	OK	NA	OK	NA	NA	
06/30/2012		14.3	OK	OK	OK	NA	NA	NA	NA	OK	NA	OK	NA	NA	

Notes: ON JUNE 19, 2012 AIR SAMPLES WERE COLLECTED FROM INLET/OUTLET PORTS TAKEN TO ESN LABORATORIES OLYMPIA, WA ON JUNE 30, 2012 THE SYSTEM WAS OPERATING AT TEMPERATURE CONCENTRATIONS WERE LOWER AND CLOSED #3 & #4 TO TRY AND GET HIGHER CONCENTRATIONS. RAISED THE COMBUSTION CHAMBER TEMPERATURE TO 650f.

Vapor Extraction System Data Sheet

Station No: PCF#352 Voc Out: 8.4 City: BREMERTON, WA

Max Flow Rate (scfm): 250 CFM Min. Op. Temp: 600 F

Date	# of Wells (Zones) On-Line	Cumulative Operating Hours	Influent Vacuum (In. H_2O)	System Flowrate (acfm)	Total Well Flow (acfm)	Average Well Influent Conc. ppm(v)	Average System Influent Conc. ppm(v)	System Influent O_2 Conc. %	Flow Pres / Vac (In. H_2O)	Flow Temp. (°F)	Adsorber Inlet Temp. (°F)	Effluent (A) Conc. ppm(V)	Effluent (B) Conc. ppm(V)	Effluent (C) Conc. ppm(V)	System Combustion Temp (°F)	Temp. Below Cat. Bed (°F)	Temp. Above Cat. Bed (°F)
07/17/2012	4	63668/8	55	140		948	300					8.4			650	680	700
#1	100%		42	80	40	220											
#2	100%		40	80	38	200											
#3	50%		34	60	40	85											
#4	closed																
07/31/2012	4	63668/8	59	176		400	200					9			650	650	687
#1	100%		54	67		280	180										
#2	100%		55	59		230	100										
#3	closed		0	0													
#4	closed		0	0													

Vapor Extraction System Maintenance Service Record

Date	Electric Meter Reading	Blower Amperage	Changed Process Filter	Changed Dilution Filter	Test Safety Interlock System	Replaced V-Belts	Changed Blower Oil	Replaced UV Scanner or Flame	Replaced Chart Pens or Paper	Inspect Fire Suppression Device	Carbon Change-Out	Automatic System Shut-Down Test	Calibrate VOC Monitor	Holding Tamk Serviced	Comments
07/17/2012	13991	14.5	OK	OK	OK	NA	NA	NA	NA	OK	NA	OK	NA	NA	
07/31/2012		12.6	OK	OK	OK	NA	NA	NA	NA	OK	NA	OK	NA	NA	

Notes: SYSTEM OFF AT ARRIVAL ON JULY 17, 2012 LIKELY A STORM EVENT AND POWER OUTAGE IN THE AREA 07/15/12.

ON JULY 17, 2012 AIR SAMPLES WERE COLLECTED FROM INLET/OUTLET PORTS TAKEN TO ESN LABORATORIES OLYMPIA, WA

ON JUNE 30, 2012 THE SYSTEM WAS OPERATING AT TEMPERATURE CONCENTRATIONS WERE LOWER AND CLOSED #3 & #4 TO

TRY AND GET HIGHER CONCENTRATIONS. RAISED THE COMBUSTION CHAMBER TEMPERATURE TO 650f.

Vapor Extraction System Data Sheet

Station No: PCF#352
Max Flow Rate (scfm): 250 CFM

Voc Out: 10

City: BREMERTON, WA
Min. Op. Temp: 630 F

Date	# of Wells (Zones) On-Line	Cumulative Operating Hours	Influent Vacuum (In. H_2O)	System Flowrate (acfm)	Total Well Flow (acfm)	Average Well Influent Conc. ppm(v)	Average System Influent Conc. ppm(v)	System Influent O_2 Conc. %	Flow Pres / Vac (In. H_2O)	Flow Temp. (°F)	Adsorber Inlet Temp. (°F)	Effluent (A) Conc. ppm(V)	Effluent (B) Conc. ppm(V)	Effluent (C) Conc. ppm(V)	System Combustion Temp (°F)	Temp. Below Cat. Bed (°F)	Temp. Above Cat. Bed (°F)
08/15/2012	4	63740/4	65	90		1200									650	650	699
#1			52.5	40		306											
#2			50	40		445											
#3			50	40		500											
#4			OFF	OFF		OFF											
08/20/2012	4	63812/2	48	176		1678									650	650	677
#1			36	45		2065											
#2			34	45		802											
#3			35	45		462											
#4			OFF	OFF		OFF											

Vapor Extraction System Maintenance Service Record

Date	Electric Meter Reading	Blower Amperage	Changed Process Filter	Changed Dilution Filter	Test Safety Interlock System	Replaced V-Belts	Changed Blower Oil	Replaced UV Scanner or Flame	Replaced Chart Pens or Paper	Inspect Fire Suppression Device	Carbon Change-Out	Automatic System Shut Down Test	Calibrate VOC Monitor	Holding Tank Serviced	Comments
08/15/2012		15.6	OK	OK	OK	NA	NA	NA	NA	OK	NA	OK	NA	NA	
08/20/2012	14460	14.8	OK	OK	OK	NA	NA	NA	NA	OK	NA	OK	NA	NA	

Notes: ON AUGUST 20, 2012 AIR SAMPLES WERE COLLECTED FROM INLET/OUTLET PORTS TAKEN TO ESN LABORATORIES OLYMPIA, WA

THE SYSTEM SHUTS DOWN DUE TO LOW PRESSURE THE AIRFLOW IS REDUCING OVER TIME LIKELY PLUGGED CAT-CELL.

SET THE BURNER TEMPERATURE TO 630 F TO TRY AND INCREASE THE REMOVAL EFFECIENCY.