FRITO-LAY
Vancouver Washington

Hydraulic Lift Area Petroleum Release

Remedial Investigation Workplan
Project Number 13002
Document Number 13002-WP

4808 NW Fruit Valley Road
Vancouver, Washington 98660

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Washington Department of Ecology
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SECTION 1. INTRODUCTION

This plan describes sampling and analysis procedures to evaluate a release of petroleum hydrocarbons at the hydraulic lift area of Frito Lay's Vancouver, Washington plant site. This workplan was prepared in response to a request by the Washington Department of Ecology (Ecology) for further information regarding this release. Frito Lay intends to perform this work under Ecology's Voluntary Cleanup Program.

A good deal of investigatory work addressing this release has been previously reported. This plan is intended to advance those findings, particularly in the determination of the extent of soil contamination to the north, east and south of the hydraulic lift. This plan also reports supplementary information, such as geology, groundwater, and site use not previously reported.

1.1 Property Description

The Frito-Lay facility manufactures snack foods, including potato chips. It is located at 4808 NW Fruit Valley Road in Vancouver, Washington and occupies approximately 18 acres west of Fruit Valley Road near the center of Section 16, T2N R1E WM. (See **Figure 1**.)

One large processing building, including administrative offices, occupies most of the east half of the site. The remainder of the east half is paved. Most of the west half is paved truck parking and includes a few small outbuildings and a stormwater retention pond. (See **Figure 2**.)

The plant site is relatively flat. There is a slight regional slope towards the NW. Ground surface elevations are approximately 30 feet above mean sea level (MSL). With the exception of the west fringe, the plant site is almost completely imperviously surfaced. The property is securely fenced and patrolled by guards and video surveillance.

1.2 Physical Setting

The site vicinity is a mix of industrial, agricultural and residential land uses. Adjacent properties include a former repair shop (Johnston property to the SE), agricultural land (City of Vancouver Property - S, W and N) and Fruit Valley Road (E). Commercial, light industrial and residential properties are located on the east side of Fruit Valley Road with the Burlington Northern/Santa Fe Railroad right of way beyond. The NuStar Terminals fuel tank farm is located approximately 400 feet north of Frito Lay. The Washington Department of Wildlife Shillapoo wildlife area is located adjacent to Vancouver Lake, approximately 1 mile west of the site.

Petroleum releases have been documented at the NuStar tank farm to the north. Petroleum constituents, including volatile aromatic compounds are reportedly present in soil and groundwater beneath the facility. Monitoring data suggests that groundwater flows to the south. Regular groundwater monitoring is being performed and remedial actions have been proposed.

Clark Public Utilities is currently constructing a public water supply well about 600 feet north of the NuStar site and intends to extract groundwater from the shallow Pleistocene Alluvial Aquifer within 6-10 years.

1.3 Climate

Clark County has a temperate climate (mild, wet winters and moderately warm, dry summers). Precipitation averages 39 inches annually, mostly as rain. Snowfall is usually light and transient. 75 percent of the precipitation falls between October and March. Rainfall intensity is generally light-to-moderate; however events of two to four inches in 24 hours can occur. Evapotranspiration has been estimated to range between 15 and 20 inches annually.

1.4 Hydraulic Lift Area

The hydraulic lift is used to unload truckload shipments of raw potatoes and convey them to storage. It is located adjacent to, and west of, the processing building. The location is shown in **Figure 2**.

A roughly 13-foot-wide strip provides access between the building and the lift. (see **Photo 1**). The strip is paved, as is the area beneath the lift. Access is shared with a bag house, a conveyor and the hydraulic drive for the lift. Foundations of the tilt-up concrete processing building and hydraulic lift may extend beneath the access strip.

Loaded tractor/trailers reverse onto the lift's platform from the south. The van is staged, detached and anchored to the platform while the tractor is parked elsewhere. Two hydraulic cylinders incline the platform and van. The angle of incline is slowly increased allowing the cargo to gently fall to a hopper. From there, a conveyor system routes them to storage. The platform can be inclined up to 45^o from horizontal.

To support the tipping moment of the elevated trailer, the hinge end of the platform (north) and the hydraulic cylinders (south) are attached to massive concrete footings embedded in the soil beneath the platform.

Concrete pavement is continuous from the processing building to at least 40 feet west of the lift. The area west of the lift was repaved in 2005 and a bentonite slurry wall was installed along the west edge of the lift at that time. The repaving work resulted in the discovery of the hydraulic lift release and is discussed further in Section 2.3, below.

1.5 Purpose and Objectives

The purpose of this project is to further the results of previous investigations and develop an estimate of the extent of petroleum contamination. This information will be used to evaluate ecological and human health risks associated with this contamination, quantify risk-based cleanup levels and identify potential remedial alternatives.

1.6 Regulations

Ecology's Model Toxic Cleanup Act (MTCA) rules govern this release. They are codified in Section 173-340 of the Washington Administrative Code.

SECTION 2. SITE HISTORY

2.1 Prior Site Use

In the late 1800s, the area was developed by orchardists, hence the name Fruit Valley. The Northern Pacific Railway (now BNSF) connected Vancouver to the Puget Sound area in 1870. Conditions remained relatively static until World War II, when industrial operations began to encroach on the area. The Frito Lay facility was constructed in the early 1970s on former agricultural land.

2.2 Previous Releases

Frito Lay records document soil cleanup during decommissioning of underground storage tanks near the southeast corner of the property and a release of Diesel oil from an oil/water separator near the south part of the property.

2.3 Hydraulic Lift Area Release

In approximately 1991, the lift collapsed during the off-loading of a shipment of potatoes. The tractor, trailer and platform fell to the west of the lift area, releasing an estimated 150 gallons of hydraulic fluid and 100 gallons of Diesel fuel from the rams and the vehicle. Contamination appeared to have been retained on pavement and was cleaned up.

On December 28, 2004, grey, discolored, silty sand was discovered by Konell Construction while removing pavement west of the lift. Thermo Fluids found Diesel- and oil-range petroleum hydrocarbons in soil samples collected from this area.

Soil analyses did not detect volatile organic compounds, PCBs, PAHs, or pesticides. Extractable barium was found below its dangerous waste threshold. Metals were not remarkable.

247.9 tons of sandy soil were excavated for off-site disposal. At 3 feet below grade, a clay layer was encountered. Contamination attenuated rapidly below this depth.

Excavation to the east was restricted by the structural concrete slab and the footings bearing the hydraulic lift. Residual contamination was detected beneath the slab. Gasoline was detected beneath the NW corner of the lift. The source of the gasoline is unknown. (A possible explanation may be infiltration of fuel from vehicles or equipment through pavement joints.) Clearance samples from all other locations were below MTCA A criteria.

During repaving, Konell Construction installed a 10" wide bentonite slurry wall along the east wall of the excavation, abutting the lift slab. The wall is inset into the clay layer and extends along the length of the lift slab. The purpose of the wall was to restrict migration of hydrocarbon westward from the residual source beneath the lift slab.

A report of these activities was prepared by EHM and has been previously submitted. Thermo Fluids' sample locations are shown in **Figure 3**. Analytical results for the residual contamination are presented in **Table 1**.

SECTION 3. LAND USE

3.1 Current

The site is currently used for food processing. Supporting activities include vehicle and equipment maintenance, fuel and cooking oil storage, waste water treatment, vehicle and equipment parking and warehousing activities.

3.2 Future

The Frito Lay property is expected to remain in industrial use for the foreseeable future.

SECTION 4. SITE CONDITIONS

4.1 Regional Geology

The site is located in the Portland Basin which was formed by Eocene to Miocene volcanic and marine sedimentary rocks. Sediments filling the basin are generally lacustrine and fluvial. Shallow lithology consists of quarternary, mainly marine, stratified sequences. These are generally silty clays or clayey silts overlying well-graded gravels and sands. These strata extend to over 50 feet below ground surface (bgs).

Groundwater migration in the Portland Basin is generally confined to three major subsystems, or aquifers. The most widely used aquifers are the water-bearing rocks of the basin fill sediments including the Tertiary Troutdale Formation, younger Pleistocene to Holocene Alluvium, and catastrophic flood deposits of Pleistocene age.

4.2 Soils

A partial review of on-site and nearby well logs was performed. Most logs represent environmental monitoring wells or investigative borings. Previous studies at Frito Lay showed brown clay extending to 25 feet bgs, The findings from nearby sites document the uniform presence of a brown clay/silt surface layer to depths between 10 and 35 feet, consistent with that seen at Frito Lay. This interval is uniformly underlain by gray, dense, fine sand to around 50 feet and comprises the Pleistocene Alluvial Aquifer (PAA).

Soils at the site are non-hydric. The National Earthquake Hazard Reduction Program (NEHRP) classifies the soil as C-D (moderate to severe risk of damage) and liquifaction potential as moderate to high.

4.3 Groundwater

Several agricultural and/or water supply wells are located within a mile of the site. Depth to groundwater varies from 11 to 32 feet bgs. The estimated elevation of the water table is around 10 feet MSL (See Washington water well report # 116511 in the **Appendix**.) Seasonal fluctuations are probable.

4.4 Chemicals of Potential Concern

Previously published reports indicate that Diesel- and oil-range petroleum products and their constituents are the principal contaminants of concern at the hydraulic lift site. At this time, gasoline is considered a secondary contaminant of concern.

SECTION 5. CONCEPTUAL MODELS

5.1 Contaminant Transport

The preliminary transport model assumes that shallow residual petroleum contamination exists beneath pavement and structures in structural sub-base and low permeability, unsaturated soils. Given the age of the release, further contaminant migration is unlikely in the absence of hydraulic head such as perched groundwater. Lateral transport of hydrocarbon is plausible in the more permeable structural sub-base beneath the pavement. Vertical transport though near-surface silts is less likely.

Using these assumptions, perched groundwater may occur in the lift area by infiltration of surface water through pavement voids or through releases of water from underground utility leaks. Westerly flow of perched groundwater will be impeded by the bentonite slurry wall while vertical flow will be impeded by low permeability silts and low hydraulic head. Lateral flow in other directions will be influenced by building and equipment foundations. For example, horizontal flow may be accelerated if unidentified preferential flow paths (such as gravel-filled underground utility trenches) exist in or near the contaminant zone.

The sampling and analysis plan (**Section 6**) addresses the vertical extent of soil contamination east of the lift. Previous studies have shown limited vertical involvement immediately west of the lift and migration to the water table is believed to be unlikely. If soil contamination is found to depths near the expected water table (around 20 feet bgs) a groundwater sample will be collected. If sample results suggest or confirm groundwater contamination, the above assumptions will be revised in an addendum to this plan.

5.2 Exposure

5.2.1 Human

Human exposure to environmental contaminants occurs through inhalation, ingestion and/or skin contact. Based on the assumptions in **Section 5.1**, ingestion of or contact with contaminated soil is unlikely at Frito Lay except during investigation or remediation. A health and safety plan for investigatory work is presented in **Section 8**.

Occupational inhalation exposure is plausible if contaminants are present in soil east of the lift. The degree of inhalatory risk is affected by the integrity of the concrete slab-on-grade building foundation, the differential pressure across the building envelope, the volatility of the contaminants and the exposure duration assumed for industrial exposure scenarios.

There are no drinking water wells at Frito Lay. As discussed above, groundwater contamination is not anticipated. Contaminant ingestion by the drinking water pathway will be addressed if analytical results indicate contamination of this medium.

Construction, demolition or other activities which disturb soil in the vicinity of the lift may result in exposure to site contaminants, however it is unlikely that existing conditions represent an unacceptable human health risk.

5.2.2 Ecological Receptors

Frito Lay is a food processor and has an active vermin control program. This dissuades the presence of avian and terrestrial species. Pavement limits potential contact with contaminants to burrowing animals, while the extent of pavement reduces the likelihood of their presence in the lift area. Existing conditions are likely protective of ecological receptors.

SECTION 6. SAMPLING AND ANALYSIS PLAN

6.1 Basis

Initial characterization samples collected by Thermo Fluids were located SW of the lift. A total of 27 soil samples were collected during the cleanup, 20 of which were located to the SW of the lift. This implies a finding that most contamination existed in this area. This is consistent with the report that the failed structure fell westerly.

The lateral extent of contamination remains undefined to the north, east and south. The vertical extent of contamination was estimated at 3 feet bgs west of the lift but has not been defined elsewhere. The residual hydraulic oil contamination is located in soil beneath the lift near the rams. This location is inaccessible without demolishing or jeopardizing the lift. Access for soil sampling is restricted by structures. These conditions suggest that sample locations should be spaced to allow statistical analyses that can extrapolate contaminant distribution (such as Kriging).

6.2 Sample Locations

Eleven preliminary sample locations are shown in **Figure 3**. Limited access may prevent sample collection at some locations. The locations are spaced on an irregular grid pattern centered on sample 15 of the previous study. The spacing is intended to permit spatial statistical analysis of the analytical results. The locations address two contaminant subareas - subarea 1 at the north part of the lift and subarea 2 at the south part of the lift.

Plant records will be reviewed to identify utility corridors and subsurface structures that may interfere with sample collection. A third-party utility location will be performed prior to sampling. Sample locations will be marked on the surface at safely accessible points as close to the planned locations as possible. Concrete will be cored in advance of sampling and the cores replaced and temporarily sealed.

6.3 Soil

Samples will be collected from depths to be determined based on field observations (such as discoloration, odor, sheen or headspace volatile organic analysis). At least one sample per 5 feet of depth will be collected.

6.3.1 Sample Collection

Sample collection may be staged to minimize analytical costs. Sample locations FL01 and FL08 are believed to be the most likely contaminated sample locations in each of the two subareas. These may be sampled using a manual push probe technique. If no contamination is evident, additional analyses may be unwarranted.

Samples will be collected using a direct push technique. A small rig (such as a Geoprobe 540 MTF) will be used to advance sleeved cores to depths up to 20 feet. Cores will be logged using USCS terminology. Coring tools and other reused sampling equipment will be decontaminated between each location.

Stainless steel tubes and plungers will be used to collect soil samples for NWTPH-Gx and VPH analysis. A clean tube will be forced into the soil core and a sample of soil extruded directly into duplicate 4-ounce VOC jars with Teflon-coated septum-lined lids using a stainless plunger. These containers will have been previously weighed and filled with a known mass of methanol to minimize losses of volatile organic compounds from the soil sample.

Samples for NWTPH-Dx, EPH and/or PAH analyses will collected from the sleeves using suitable tools and transferred directly to clean, 8-ounce, clear, wide-mouth, glass jars with Teflon seals. Containers will be filled to minimize head space.

Containers will be uniquely labeled, preserved by cooling to $4^{o}C$ and transported to the analytical laboratory in refrigerated coolers under routine chain of custody documentation.

Additionally, samples from each depth and location will be placed in sealable plastic bags for field screening analyses.

6.3.2 Analysis

6.3.2.1 Screening

The bag samples will be labeled and warmed briefly prior to screening analysis. The tip of a photoionization detector (PID) will be inserted into a slit in each sample bag and the maximum reading recorded. The detector will be calibrated against isobutylene and zero air prior to use. Background readings will be recorded prior to analyzing samples in the field.

Odor and visual appearance of the samples will be recorded following PID measurements. A sub-sample will then placed in a shallow pan, flooded with water and the surface observed for floating oil globules or sheen suggestive of petroleum contamination.

6.3.2.2 Chemical Analysis

Samples will be analyzed at Specialty Analytical, Inc. in Clackamas, Oregon. Petroleum hydrocarbon fractions will be quantified using Method NWTPH-Gx or NWTPH-Dx. Percent moisture will be determined using Standard Method SM 2540.

Samples at the north end of the lift (sub area 1, sample locations FL01-FL04) are located to evaluate the gasoline and Diesel detections previously reported there. Analyses at these locations will include NWTPH-Gx, NWTPH-Dx. Samples at the south end (sub area 2, sample locations FL05-FL11) are located to evaluate the Diesel and oil detections at location 15. These samples will be analyzed using NWTPH-Dx.

In addition, one sample from each of the two sub areas showing the highest Gx and/or Dx concentrations will subsequently be analyzed using Ecology's Method for the Determination of Extractable Petroleum Hydrocarbons Fractions (EPH), Ecology's Method for the Determination of Volatile Petroleum Hydrocarbons Fractions (VPH) Risk-base

Decision Making Volatile Organic Compounds (EPA Method 8260b) and Polycyclic Aromatic Hydrocarbons (PAH) (EPA Method 8270-SIMM) for health risk determinations.

6.4 Groundwater

6.4.1 Sample Collection

In the event that soil contamination is evident at depths below 15 feet bgs, a groundwater sample will be collected from that location. A hydroprobe will be pushed in 5 foot runs until the water table is encountered. A peristaltic pump will be used to collect a water sample.

Three HCl-preserved, 40-ml VOA vials will be filled to zero headspace directly from the pump outlet. Two HCl-preserved, 1-liter, amber, glass bottles will be similarly filled. Samples will be refrigerated immediately and transported under routine chain of custody.

6.4.2 Analysis

Water samples will be analyzed for RBDM volatiles, PAH, EPH and VPH using the methods described, above.

6.5 Quality Assurance

No soil duplicates or blanks will be collected (due the innate heterogeneity of soil). One water trip blank, consisting of distilled water, will be submitted if a groundwater sample is collected All samples will be extracted and analyzed within method holding limits.

Analytical quality control will be consistent with standard method requirements.

6.6 Abandonment

Bore holes will be abandoned in accordance with Ecology regulations. Bentonite chips will be placed in bore holes to the soil surface. Concrete corings will be patched with quick-setting concrete. Sample locations will be measured and keyed to a fixed structure or bench mark.

Debris will be collected and bagged for off-site landfill disposal. Waste soil will be collected and shipped for off-site landfill disposal following receipt of analytical results. Decontamination liquids will be disposed of by the drilling contractor under local permit.

SECTION 7. DATA REDUCTION

TPH analytical results will be compared to MTCA Method A standards. If no result exceeds these limits, no further assessment will be performed. If these criteria are not met, site-specific risk-based calculations will be performed using the MTCATPH11.1 human health risk calculation program (or most recent release).

Analytical results will be summarized in a data table. If indicated, a contour plot of the contaminant distribution will be prepared and presented graphically.

SECTION 8. HEALTH AND SAFETY

All sampling personnel will have completed a 40-hour HAZWOPER training course and have a current annual update certificate. Level D personal protective equipment will be used during sampling. Level D will include eye protection, impervious gloves (nitrile or PVC) and hard hats. Push rig operators must wear steel-toed footwear. If operating in traffic areas, reflective safety vests or jackets must be worn. Splash suits or disposable coveralls are optional. Respiratory protection is not required.

SECTION 9. TABLES

TABLE 1:

FRITO-LAY
Hydraulic Lift Area Soil Cleanup Project
Residual Contamination Samples
Analytical Results

Sample ID:		EPA PRG[a]		Ecology Human Health[b]			12@6	13@12	14@24	15@36	15-2	16@24	17@36	5	4-2	6-2
Sample Date:	**Units**	Residential	Industrial	A Unrestricted	A Industrial	B Unrestricted	1/6/2005	1/6/2005	1/6/2005	1/6/2005	1/7/2005	1/6/2005	1/6/2005	12/30/2004	1/7/2005	1/7/2005
Metals, TCLP																
Arsenic	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.500 U	N/A	N/A	N/A	0.500 U	0.500 U
Barium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	1.442	N/A	N/A	N/A	1.442	1.442
Cadmium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.100 U	N/A	N/A	N/A	0.100 U	0.100 U
Chromium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.216	N/A	N/A	N/A	0.216	0.216
Lead	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.390 U	N/A	N/A	N/A	0.390 U	0.390 U
Mercury	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.170 U	N/A	N/A	N/A	0.170 U	0.170 U
Selenium	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.630 U	N/A	N/A	N/A	0.630 U	0.630 U
Silver	mg/L	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	0.130 U	N/A	N/A	N/A	0.130 U	0.130 U
Metals, Total																
Arsenic	mg/Kg	0.39	1.6	20	20	0.67	N/A	N/A	N/A	N/A	0.520	N/A	N/A	N/A	0.500 U	2.851
Cadmium	mg/Kg	37	450	2	2	80	N/A	N/A	N/A	N/A	1.984	N/A	N/A	N/A	2.317	2.532
Chromium	mg/Kg	100,000	100,000	2,000	2,000	120,000	N/A	N/A	N/A	N/A	30.016	N/A	N/A	N/A	9.846	20.965
Lead	mg/Kg	400	800	250	1,000	N/E	N/A	N/A	N/A	N/A	10.555	N/A	N/A	N/A	3.118	10.225
Mercury	mg/Kg	23	310	2.0	2.0	24	N/A	N/A	N/A	N/A	0.170 U	N/A	N/A	N/A	0.170 U	0.170 U
Chromium VI	mg/Kg	30	64	19	19	240	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Petroleum																
NWTPH-Gx	mg/Kg	N/E	N/E	30/100	30/100	N/E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NWTPH-Dx Diesel	mg/Kg	N/E	N/E	2,000	2,000	N/E	1,150	4,790	3,380	4,860	N/A	2,740	4,010	2,910	N/A	N/A
NWTPH-Dx Oil	mg/Kg	N/E	N/E	2,000	2,000	N/E	2,740	8,650	7,910	12,700	N/A	10,800	16,900	6,750	N/A	N/A
NC6-12 Gas	mg/Kg	N/E	N/E	30/100	30/100	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	455	50 U
NC>12-22 Diesel	mg/Kg	N/E	N/E	2,000	2,000	N/E	N/A	N/A	N/A	N/A	135	N/A	N/A	N/A	3,980	86
NC>22-35 Lube Oil	mg/Kg	N/E	N/E	2,000	2,000	N/E	N/A	N/A	N/A	N/A	8,485	N/A	N/A	N/A	125	1,979
NC>35-40 Heavy Oil	mg/Kg	N/E	N/E	2,000	2,000	N/E	N/A	N/A	N/A	N/A	460	N/A	N/A	N/A	50 U	205
NC6-40 Total HC	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	9,080	N/A	N/A	N/A	4,560	2,270
PAHs																
Acenaphthene	mg/Kg	3,700	29,000	N/E	N/E	4,800	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Acenaphthylene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Anthracene	mg/Kg	22,000	100,000	N/E	N/E	24,000	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(a)anthracene	mg/Kg	0.62	2.10	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(a)pyrene	mg/Kg	0.062	0.210	0.1	2.0	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(b)fluoranthene	mg/Kg	0.62	2.10	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(j)fluoranthene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(k)fluoranthene	mg/Kg	6.2	21	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Benzo(g,h,i)perylene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Chrysene	mg/Kg	0.062	0.210	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenz(a,h)acridine	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenz(a,j)acridine	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenzo(a,h)anthracene	mg/Kg	0	0	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
7H-Dibenzo(c,g)carbazole	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenzo(a,e)pyrene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenzo(a,h)pyrene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Dibenzo(a,i)pyrene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Fluoranthene	mg/Kg	2,300	22,000	N/E	N/E	3,200	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Fluorene	mg/Kg	2,700	26,000	N/E	N/E	3,200	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Indeno(1,2,3-c,d)pyrene	mg/Kg	0.62	2.10	N/E	N/E	0.137	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
3-methylcholanthrene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Naphthalene	mg/Kg	56	190	5	5	1,600	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Phenanthrene	mg/Kg	N/E	N/E	N/E	N/E	N/E	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Pyrene	mg/Kg	2,300	29,000	N/E	N/E	2,400	N/A	N/A	N/A	N/A	50 U	N/A	N/A	N/A	50 U	50 U
Volatile Organics																
EDB	mg/Kg	0.032	0.073	0.005	0.005	0.0118	N/A	N/A	0.001 U	N/A	0.001 U	N/A	N/A	N/A	0.001 U	0.001 U
Other	mg/Kg	Varies	Varies	Varies	Varies	Varies	N/A	N/A	0.10 U	N/A	0.100 U	N/A	N/A	N/A	3.128 [a]	0.100 U
Pesticides																
Lindane	mg/Kg	0.44	1.70	0.01	0.01	0.769	N/A	N/A	0.010 U	N/A	0.010 U	N/A	N/A	N/A	0.010 U	0.010 U
DDT	mg/Kg	1.7	7.0	3	4	2.94	N/A	N/A	0.010 U	N/A	0.010 U	N/A	N/A	N/A	0.010 U	0.010 U
PCBs																
Total PCBs	mg/Kg	3.9/0.22	21/0.74	1	10	N/E	N/A	N/A	0.05 U	N/A	0.05 U	N/A	N/A	N/A	0.05 U	0.05 U
Solids																
Total Solids	% (w/w)	N/E	N/E	N/E	N/E	N/E	81.1	86.5	86.6	89.5	N/A	90.3	81.6	84.7	N/A	N/A

NOTES: a: Total 8260 volatiles. Detected analytes are: benzene - 0.726 mg/Kg, ethylbenzene - 0.180 mg/Kg, toluene - 1.604 mg/Kg, xylenes - 0.618 mg/Kg.

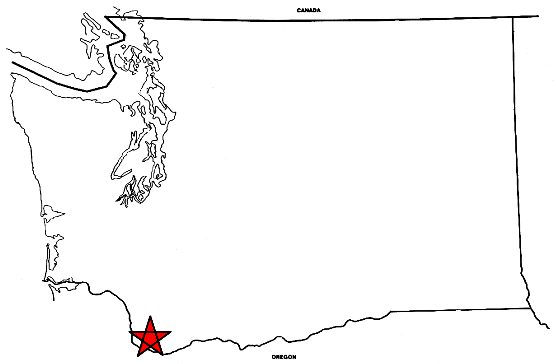
U = not detected at the limit of detection shown

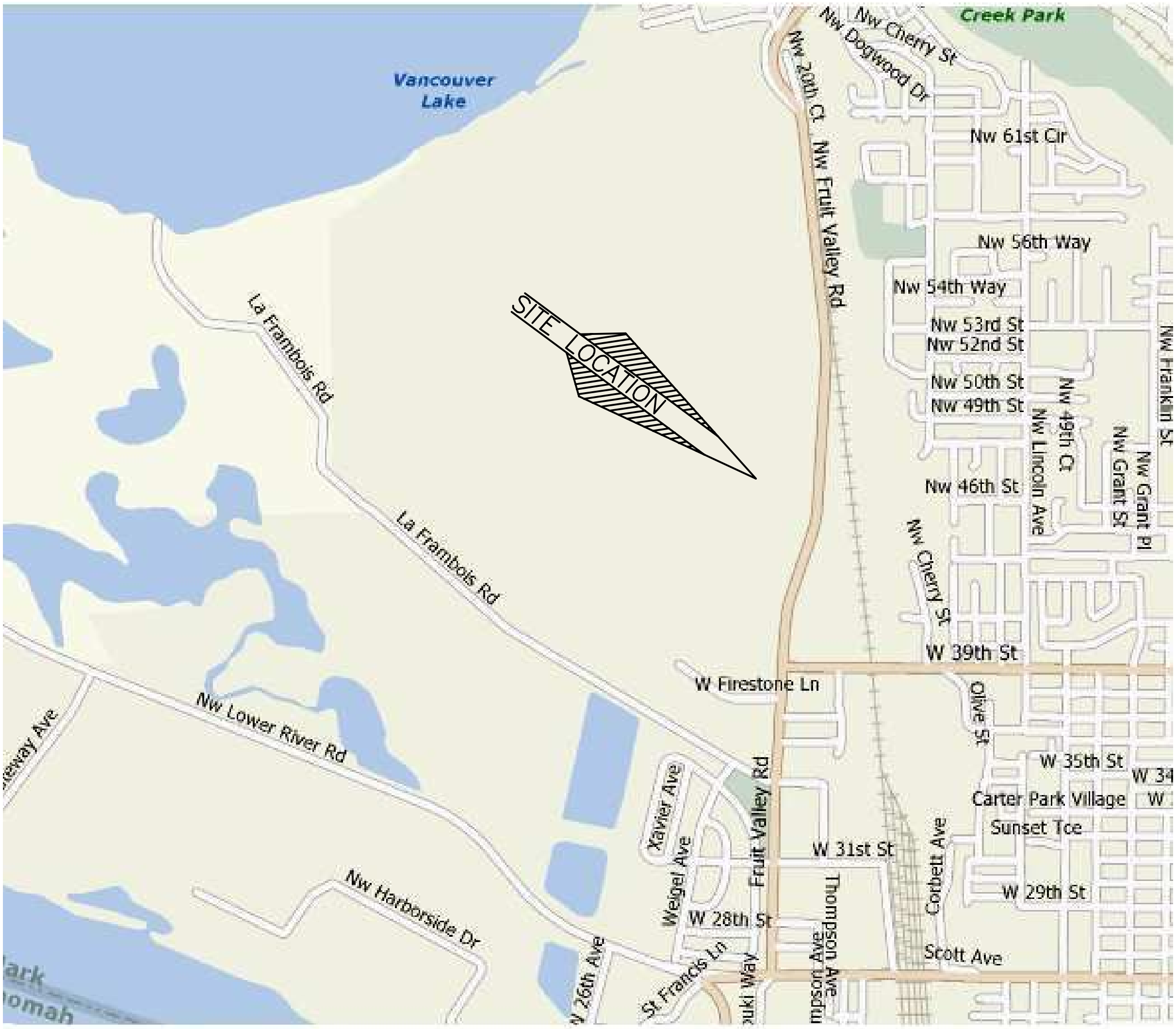
N/A = Not analyzed for this analyte

N/E = Criterion not established for this analyte

Analytes exceeding one or more MTCA criterion are highlighted in RED.

SECTION 10. FIGURES





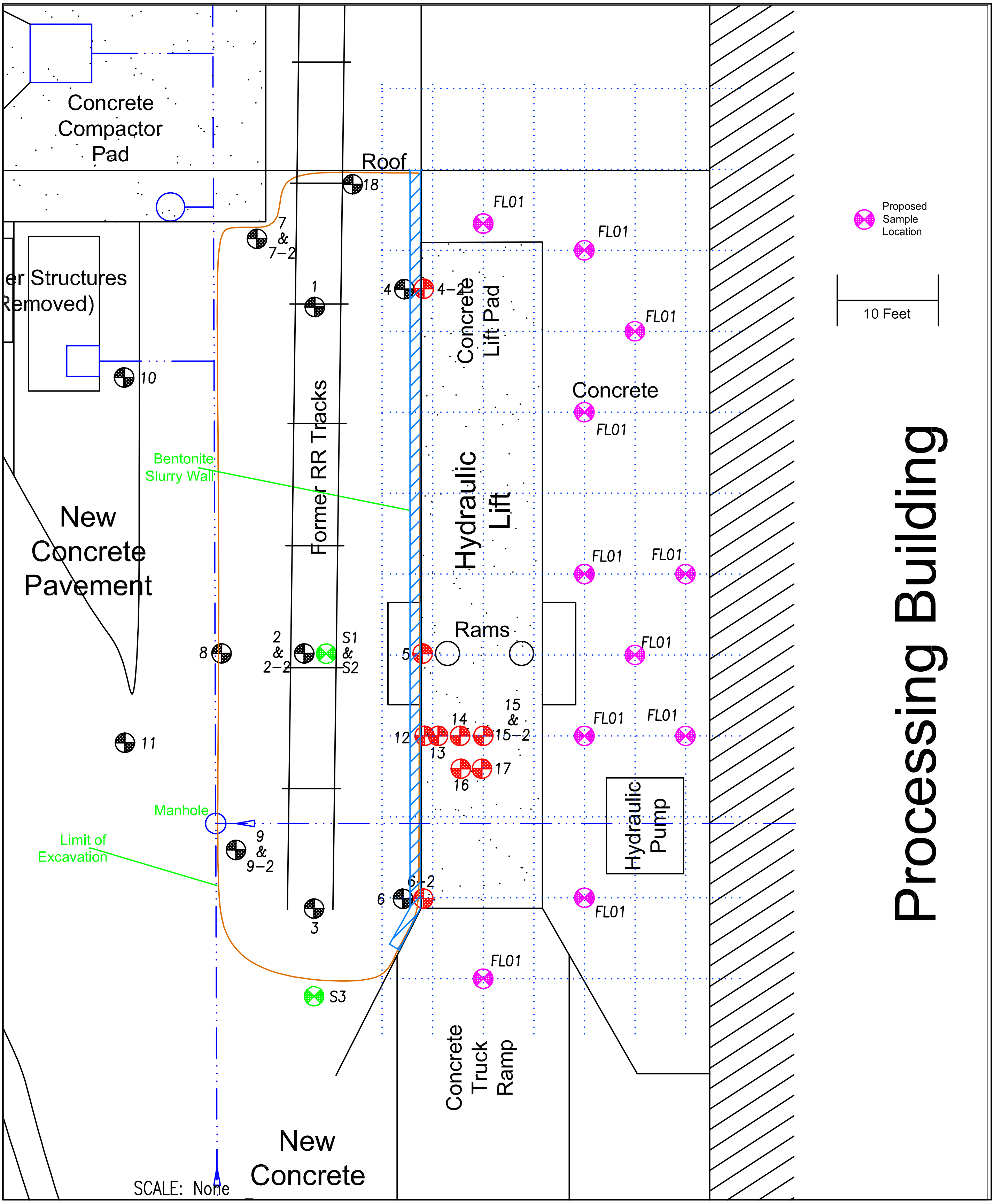
ENVIRONMENTAL HEALTH MANAGEMENT, Inc
PO BOX 1746
Lake Oswego, Oregon 97035
(503) 287-4620

DRAWN BY:	KIM
APPROVED BY:	JHR
DATE:	3/26/09
JOB NO.:	13002

FRITO LAY – Vancouver
Hydraulic Lift Area Investigation
Location Map

FIGURE 1

EHM Environmental Health Management, Inc. PO BOX 1746 Lake Oswego, Oregon 97035 (503) 287-4620	Detail – Site Layout	DRAWN BY: JHR APPROVED BY: JHR DATE: 3/27/09 PROJECT NO.: 13002	Frito Lay Vancouver, Washington Hydraulic Lift Area Investigation	FIGURE 2



ENVIRONMENTAL HEALTH MANAGEMENT, INC. PO Box 1746 Lake Oswego, Oregon 97035 (503) 287-4620	DRAWN BY: KIM APPROVED BY: JHR DATE: 12/15/08 JOB NO.: 13002	FRITO LAY Vancouver Hydraulic Lift Area Investigation Sample Locations	FIGURE 3

SECTION 11. PHOTOS

Photo 1: East side of hydraulic lift looking south. Processing building is to the left. Note limited access, hinge end concrete footing.

Photo 2: North end of hydraulic lift looking NE. Note concrete pavement joints, hinge end concrete footing, van on lift platform. Bentonite slurry wall is located beneath pavement to the right of the pavement joint.

SECTION 12. APPENDIX

File Original with Department of Ecology
Second Copy Owner's Copy
Third Copy Driller's Copy
116511

WATER WELL REPORT

STATE OF WASHINGTON

Notice of Intent R052254
UNIQUE WELL I D # AGP-461
Water Right Permit No

(1) **OWNER** Name Clark Public Utilities Address PO Box 8900, Vancouver, WA 98668

(2) **LOCATION OF WELL** County Clark NE 1/4 NW 1/4 Sec 16 T 2 N R 1E WM

(2a) **STREET ADDRESS OF WELL** (or nearest address)

TAX PARCEL NO 147361000

(3) **PROPOSED USE** ☐ Domestic ☐ Industrial ☐ Municipal ☐ Irrigation ☒ Test Well ☐ Other ☐ DeWater

(4) **TYPE OF WORK** Owner's number of well (if more than one) TW-4
☒ New Well ☐ Deepened ☐ Reconditioned ☐ Decommission
Method ☐ Dug ☐ Bored ☐ Cable ☐ Driven ☒ Rotary ☐ Jetted

(5) **DIMENSIONS** Diameter of well 8 inches
Drilled 178 feet Depth of completed well 155 ft

(6) **CONSTRUCTION DETAILS**
Casing Installed
☒ Welded 8 Diam from +2 ft to 70 ft
☐ Liner installed Diam from ft to ft
☐ Threaded Diam from ft to ft

Perforations ☐ Yes ☒ No
Type of perforator used
SIZE of perforations in by in
perforations from ft to ft

Screens ☒ Yes ☐ No ☐ K Pac Location 66 ft
Manufacturer's Name Johnson stainless steel
Type See screen description Model No
Diam Slot Size from ft to ft
Diam Slot Size from ft to ft

Gravel/Filter packed ☐ Yes ☒ No ☐ Size of gravel/sand
Material placed from ft to ft

Surface seal ☒ Yes ☐ No To what depth? 18 ft
Material used in seal Bentonite chips
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

(7) **PUMP** Manufacturer's Name
Type H P

(8) **WATER LEVELS** Land surface elevation above mean sea level 20 ft
Static level 11.1 ft below top of well Date 6/18/02
Artesian pressure lbs per square inch Date
Artesian water is controlled by
(Cap valve etc)

(9) **WELL TESTS** Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes by whom? PGG / Holt
Yield 703 gal /min with 46.5 ft drawdown after 9 hrs
Yield gal /min with ft drawdown after hrs
Yield gal /min with ft drawdown after hrs
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
1	11.4	5	11.25	20	11.19
2	11.32	10	11.23	30	11.19
3	11.3	15	11.2		

Date of test
Bailer test gal /min with ft drawdown after hrs
Airtest gal /min with ft drawdown after hrs
Artesian flow g p m Date
Temperature of water 53°F Was a chemical analysis made? ☒ Yes ☐ No

RECEIVED
JUN 28 2002
Washington State Department of Ecology

(10) **WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION**
Formation Describe by color character size of material and structure and the kind and nature of the material in each stratum penetrated with at least one entry for each change of information Indicate all water encountered

MATERIAL	FROM	TO
Brown SILT	0	33
Gray-black fine SAND	33	53
Gray-black silty SAND & GRAVEL	53	70
Gray-black, med-coarse SAND & GRAVEL	70	77
Gray-black, medium-coarse SAND	77	93
Brown-black, medium-coarse SAND	93	117
Brown-black silty fine-coarse SAND	117	120
Brown-black SAND & GRAVEL	120	163
Brown-black slightly silty to silty SAND & GRAVEL	163	178
Screens:		
66-70 - blank pipe/K-packer		
70-90 - 8" telescopic screen-60 slot		
90-96 - blank pipe		
96-110 - 8" telescopic screen-60 slot		
110-116 - blank pipe		
116-152 - 8" telescopic screen-80 slot		

Work Started 5/28 2002 Completed 6/19 2002

WELL CONSTRUCTION CERTIFICATION

I constructed and/or accept responsibility for construction of this well and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Type or Print Name Randy Holt License No 1099
(Licensed Driller/Engineer)
Trainee Name License No
Drilling Company Holt Drilling Inc
(Signed) [signature] License No 1099
(Licensed Driller/Engineer)
Address PO Box 1890 Milton WA 98354
Contractor's Registration No HOLTDI*136OG Date 6/24/02

(USE ADDITIONAL SHEETS IF NECESSARY)

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ECY 050 1 20 (11/98)