WHITMARSH LANDFILL SIT 6

SUMMARY OF EXISTING INFORMATION AND IDENTIFICATION OF UPLAND DATA GAPS MARCH POINT (AKA WHITMARSH LANDFILL) ANACORTES, WASHINGTON

APRIL 11, 2007

FOR
WASHINGTON STATE DEPARTMENT OF ECOLOGY

GeoEngineers

File No. 0504-037-00

Summary of Existing information and Identification of Upland Data Gaps March Point (aka Whitmarsh) Landfill File No. 0504-037-00

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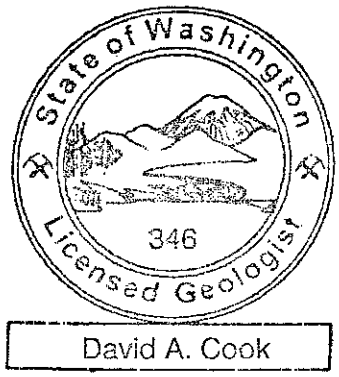

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1.0 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

The March Point Landfill (landfill; also known as the Whitmarsh Landfill) is a high priority for cleanup under the Puget Sound Initiative, based on its potential impact to Padilla Bay. The landfill and Padilla Bay are located on the west side of March Point near Anacortes, Washington. The Site is shown on Figure 1.

According to previous investigations, off-shore sediments and sediments near inner and outer Padilla Bay Lagoon have been impacted by metals, chlorinated benzenes, phthalates, phenols, petroleum-related compounds, polychlorinated biphenyls (PCBs), and dioxins and furans. Information is limited related to the contents and fill history of the landfill. Additionally, no soil and/or groundwater chemical analytical testing has been completed in the upland portion of the landfill.

GeoEngineers is working in collaboration as Science Application International Corporation's (SAIC's) teaming partner on this project under Ecology's "Hazardous Substances Site Investigation & Remediation for the Toxics Cleanup Program Contract # C0700034; Work Assignment # SAIC004" held between SAIC and Ecology. GeoEngineers' role on this project is to evaluate upland issues while SAIC's focus is related to aquatic and sediment issues. The aquatic and sediment data gap evaluation is outlined in the "Summary of Existing Information and Identification of Sediment Data Gaps" report (Sediment Data Gaps report; SAIC, 2007).

The purpose of this report is to summarize existing information and to identify data gaps related to the landfill and upland soil and groundwater. SAIC is reporting on data gaps related to the aquatic and sediment portion of the Site. These reports will be used as the basis of a remedial investigation/feasibility study (RI/FS) work plan. The purpose of the RI/FS is to conduct a site investigation to define the nature and extent of contamination in all media and to develop an appropriate remedy. Drawing on the expertise of both GeoEngineers and SAIC, the RIFS study will be completed so that upland and aquatic remedies are addressed cohesively.

1.2 REPORT ORGANIZATION

This report is divided into the following sections.

- March Point Landfill. This section includes a description of the landfill, the fill history, and a summary of previous investigations.
- Potential Sources of Contamination. This section identifies potential sources of contamination in soil, groundwater, surface water and leachate.
- Summary of Data Gaps. This section presents a summary of upland data gaps.

2.0 MARCH POINT LANDFILL

2.1 SITE DESCRIPTION

The abandoned landfill is located at 9663 South March Point Road in Anacortes, Washington (Figure 1). The landfill is located at the base of a bluff in the tidelands area of Padilla Bay. The landfill is bounded by South March Point Road and Highway 20 to the southwest, Padilla Bay and Padilla Bay Lagoon to the northeast, and the Swinomish Reservation and Swinomish Channel to the east (Figures 1 and 2). Previous reports also refer to (a) small stream(s) that run along the southeast, south, and/or southwest side of the landfill.

The landfill was used as a public dump from the 1950s until 1973. The landfill was unregulated (an uncontrolled public dump) through 1961 and not strictly regulated after that. Skagit County operated the dump from 1961 through 1973. According to Britt Pfaff-Dunton of the Skagit County Health Department, at one point a private citizen, who had a contract with the county for salvage rights, lived at the landfill, but did not collect fees or regulate the waste (GeoEngineers personal communication, 2007). The Skagit County Hazard Assessment states that the fill appears to be 10 to 15-feet above the level of the adjacent Padilla Bay Lagoon tidelands (Skagit County, 2003).

At the time of closure, the landfill was graded and covered with 2 to 3 feet of soil (of unknown source or quality) and has been revegetated with alders and grass. There is a dike built on the seaward north side and we observed leachate flowing out of the landfill into Padilla Bay Lagoon during the December 2006 site reconnaissance. Most of the former landfill is now occupied by an operating cedar log mill which has operated at the Site since the late 1980s. The site is currently covered with cedar wood waste from the mill. Blackberry bushes and wild grass grow on the edges of the landfill. Current photographs taken during our December 2006 site reconnaissance are included as Figure 3.

The estimated boundary of the landfill was recorded by the Skagit County Health Department using global positioning equipment (GPS) equipment in 2002. This boundary is shown on Figure 2. Based on these GPS data, provided to GeoEngineers by the Skagit County Health Department, the landfill is approximately 14 acres.

2.2 SITE OWNERSHIP

The site includes tax parcel numbers P19676, P19684, P19707, P19713, and P19761 (Figure 4). As of January 2007 these parcels are owned by the following:

- P19676 (4.86 acres); Snow Mountain Land Company, LLC.
- P19684 (4.82 acres); Charles and Margaret Ellen Moon.
- P19707 (1,620 feet); Washington State Department of Natural Resources.
- P19713 (1.32 acres); Snow Mountain Land Company.
- P19761 (0.04 acres); Ralph Hillestead.

2.3 LANDFILL WASTE TYPE AND HISTORY

Knowledge of the waste types and quantities, other than municipal wastes (household, commercial, industrial), that were buried is limited. According to Ecology documents that we reviewed, four major chemical and oil industries (Texaco and Shell refineries, Allied Chemical Sulfuric Acid Plant, and the Northwest Petrochemical Company) may have transported waste to the landfill. These industrial facilities

are located on March Point and were in operation during the period of time the landfill was active. Wastes at the landfill were routinely burned until 1969 according to Ecology's 2003 Site Hazard Assessment (SHA; Ecology, 2003). From 1969 until 1973 the landfill was the county's primary solid waste disposal site. According to Britt Pfaff-Dunton of the Skagit County Health Department, around 1969 agencies started to ban burning at landfills and started shutting down other landfills closer to population centers. This may have increased the pressure to dump wastes at the landfill (GeoEngineers personal communication, 2007). Skagit County Public Works records of waste accepted from 1970 indicate that waste was coming from the cities of Anacortes, Burlington, La Conner, Mt. Vernon, Sedro Woolley, rural Skagit County, Whidbey Island, Shell and Texaco Refineries.

Very little data are available from county records regarding the landfill during its operation (Skagit County, 2003). Skagit County Department of Health has not spoken directly with Texaco, Shell, Allied Chemical Sulfuric Acid Plant, or the Northwest Petrochemical Company regarding the companies' records of waste disposal at the landfill. According to Ms. Pfaff-Dunton, the best records regarding the types of waste disposed at the landfill are a series of photographs from the 1968 and 1970 and the Skagit County Public Works department records from 1970. Photographs taken by Jack Wai in 1968 and 1970 show 55-gallon and smaller drums in the landfill and waste disposed on the tidelands and in Padilla Bay Lagoon (Ecology and Skagit County Health Department files). (Figures 5 through 8).

According to Ken Willis, from the Skagit County Health Department, vanadium catalysts in a powdered form were dumped at the landfill (Ecology, 1986).

Skagit County Health Department interviewed a former truck driver for the Shell Refinery (Skagit County, 2003). According to the truck driver:

- Wastes from the Shell refinery were brought to the landfill from 1965 to 1971.
- Most of the waste types were unknown since they were containerized.
- Approximately every three months about 20 barrels of "heavy catalyst from the alkylating units" were dumped at the landfill.
- A large amount of asbestos containing material was dumped at the landfill.
- In general, the worst of the chemical waste from the refinery was sent to the nearby PM Northwest dump located on the Swinomish Reservation.

According to Ms. Pfaff-Dunton of the Skagit County Health Department, the truck driver also stated that generally wastes that were disposed of as liquids (i.e., not in drums) went to the PM Northwest dump and that waste in drums went to the landfill. However, drums, in varying stages of decay, were found at the PM Northwest landfill.

2.4 GEOLOGY AND HYDROLOGY

The landfill is located at the base of a bluff that lies in the tidelands of Padilla Bay. The USGS geologic map (USGS, 2000) shows that the landfill consists of "artificial fill." Nearby soil is mapped as 1) Olympia non-glacial deposits consisting of gravelly, organic-rich and/or silty sand, silt, clay and peat; 2) landslide deposits on the upslope portion of the site near southeast side of the landfill; and 3) a glacial till adjacent to west side of the landfill. 24 well logs (Ecology, 2007) for monitoring wells, domestic wells, and resource protection wells within 0.5 miles of the landfill show soils to a depth of 20-feet below ground surface (bgs) generally consist of sand and gravel with some silt and clay.

Information from two USGS reports on the groundwater conditions at the Swinomish Indian Reservation (USGS, 1998a and 1998b) indicate the presence of a shallow aquifer (Outwash aquifer in the USGS report) and a deep aquifer (Sea-level aquifer in the USGS report). The landfill is located at the north end of the reservation. A review of the 24 well logs within 0.5 miles of the landfill identified shallow and deep groundwater bearing zones. Based on elevation changes south of the landfill, it is not known if the shallow and deep groundwater bearing zones identified in the well logs correspond with the Outwash and Sea-level aquifers identified in the USGS reports.

Five resource protection wells approximately 2,500 feet southeast of the landfill and four groundwater monitoring wells approximately 1,000 feet northwest of the landfill identified static water levels of 4 to 5.5 feet bgs. A domestic well approximately 2,500 feet upgradient (to the south) identified a deep water bearing zone at a depth of 67 to 77 feet bgs with a static water level of 4 feet bgs. According to Ecology's 1986 site investigation report (SI), shallow groundwater was noted in the borrow pit west of the landfill at an estimated depth of 10 feet below ground surface (Ecology, 1986).

A well log from a domestic well approximately 2,000 feet upgradient (to the south) identified a deep water bearing zone at a depth of 82 to 106 feet bgs with a static water level of 84 feet bgs. A well log from a USGS domestic well approximately 2,500 feet southeast of the landfill identified a deep water bearing zone at a depth of 86 to 88 feet bgs with a static water level of 69 feet bgs.

Tide tables for the Swinomish Channel Entrance to Padilla Bay indicate that in 2006 there were tidal fluctuations in the range of 13 feet between low and high tides. According to Ecology's 1986 SI report, there is tidal incursion to the landfill along Padilla Bay that mixes with leachates at high tide (Ecology, 1986).

2.5 GROUNDWATER AND SURFACE WATER USES

The Washington State Well Log Viewer (Ecology, 2007) identified three domestic wells within 0.5 miles south and upgradient of the landfill. In addition, there are either one or two Skagit County Public Utilities District wells within 1,500 feet of the landfill (the purpose of these two wells is not noted on the well logs). Ecology's well log viewer identifies two locations 1) 1,000 feet west of the landfill and 2) 1,500 feet southwest of the landfill (Ecology, 2007). However, only one well log is provided for both locations. According to Ecology's 1986 SI report, approximately 10,000 people in a four mile radius use groundwater for drinking (Ecology, 1986). Groundwater is presumed to flow towards Padilla Bay in a northerly direction; therefore, these water wells would be located upgradient or cross-gradient of the landfill.

Padilla Bay is used for fishing, recreation, and is a National Estuary Reserve. Padilla Bay is also used extensively by the Swinomish fishing fleet and supports subsistence fishing by tribal members.

2.6 PREVIOUS INVESTIGATIONS – UPLAND

This section discusses preliminary and site hazard assessments (no sampling was completed) as well as Site investigations where leachate and surface water sampling and testing were conducted at the landfill. Note that some of these studies also included sediment and/or biota sampling and testing. These results are summarized in the Sediment Data Gaps report (SAIC, 2007). According to Ecology, the Swinomish Tribe collected a water (surface water or leachate) sample in 1997 (Ecology, 1999). The analytical results for this sample were not provided to us and have not been reviewed.

The approximate location of previous leachate/surface water samples are shown on Figure 9. The analytical data associated with these samples are shown on Tables 1 through 4. Note that regulatory

guidance and chemical analytical testing methodologies have changed since the studies outlined below have been completed. We have reiterated the conclusions of each study but have also compared the detected concentrations to current surface water criteria to evaluate whether chemicals of concern are present and are of regulatory concern based on current regulatory criteria. The surface water criteria are being used in this report for screening purposes, and are not intended to represent proposed or final cleanup levels.

2.6.1 Preliminary Assessment (Ecology, 1985)

Ecology and EPA conducted a Preliminary Assessment (PA) of the landfill in November 1984 and identified the site as a medium priority. The PA identified potentially contaminated groundwater, tidal incursion into the landfill, and leachate surfacing on the eastern landfill boundary as potential hazards to human health or the environment. The PA identified concerns regarding industries (i.e., Shell and Texaco refineries, Allied Chemical Sulfuric Acid Plant, and the Northwest Petrochemical Company) that were present in the local area at the time of unregulated dumping. Texaco, in a 103(c) notification, called March Point Landfill their "off-site No. 2," which has been interpreted as an offsite disposal facility for Texaco. The PA recommended analyzing leachate for priority pollutants and, if necessary, follow-up sampling including the installation and sampling of groundwater monitoring wells. The PA also recommended that historical data on industrial activities and waste dumping practices should be obtained from industries operating on March Point.

2.6.2 Site Inspection (Ecology, 1986)

Based on the results of the 1984 PA, Ecology conducted a site inspection (SI) at the March Point Landfill in December 1985. Ecology collected three surface water samples (NCT091, NCT092, and NCT094), one leachate sample (NCT095), and two sediment samples (surface water and leachate sample locations are shown on Figure 9). The surface water samples were collected at the following locations: 1) borrow pit upgradient of the landfill (NCT091), 2) estuarial stream southeast of landfill (NCT092), 3) Padilla Bay lagoon surface water at the northeast side of landfill (NCT094). The location where sample NCT092 was collected is not clear. The SI report states that "sample NCT092 was taken from an estuarial stream on the southeast edge of the landfill." However, the sample location figure in the SI report (Figure 1) shows the NCT092 sample location approximately 2,500 feet southeast of the landfill (Ecology, 1986). Figure 9 shows both potential NCT092 sample locations. The leachate sample was collected at the northeast side of landfill. The surface water and leachate samples were analyzed for EPA priority pollutant metals and volatile organic compounds (VOCs). At the time that the report was produced, Ecology concluded that "sampling data do not show a significant problem at this landfill to warrant further sampling or remedial actions."

Based on our review of the 1985 sample results as compared to current surface water criteria: arsenic, copper, mercury, and nickel were detected in at least two water samples at concentrations greater than their respective aquatic life or human health surface water criteria (see Table 1).

2.6.3 Analysis Of Leachate From Whitmarsh Landfill (Ecology, 1989)

Ecology collected a grab sample of leachate (sample 88-257426) from the northeast corner of the landfill in June 1988 (Figure 9). The sample was analyzed for priority pollutant metals. The letter concluded that the results were "an indication of a heavy metals problem at Whitmarsh which will require further study."

Based on our review of the 1989 sample results as compared to current surface water criteria: arsenic, cadmium, chromium, copper, lead, nickel, thallium, and zinc were detected at concentrations greater than their respective surface water criteria (see Table 2).

2.6.4 Skagit County Department Of Health Sampling (Skagit County, 1996)

Based on Swinomish Indian Tribal Community concerns regarding potential contaminant releases from the March Point Landfill (referred to as the Whitmarsh Landfill in this 1996 letter) into Padilla Bay, the Skagit County Department of Health collected surface water and sediment samples near the landfill in October 1996. Two water sample locations were identified based on the presence of discolored water emanating from the concrete rip-rap wall along the northeast side of the landfill (Figure 9). A leachate and sediment sample were collected at each location (leachate sample numbers WMW-1 and WMW-2; see the Sediment Data Gaps report [SAIC, 2007] for sediment sample information). Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), and metals. No analytes were detected at concentrations greater than their respective surface water criteria (Table 3). The report concluded that "further investigation using county resources is not warranted at this time."

Based on our review of the 1996 sample results as compared to current surface water criteria, although there were detected concentrations of VOCs and SVOCs and phenols, none of the chemicals exceeded their respective surface water criteria.

2.6.5 Ecology Investigation Of Chemical Contamination At Whitmarsh Landfill And Padilla Bay Lagoon (Ecology, 1999)

Ecology collected two leachate (samples 248005 and 248006) and two sediment samples (see the Sediment Data Gaps report [SAIC, 2007]) near the northeast corner of the landfill (Figure 9) in June 1998. The purpose of these samples was to identify contaminants of potential concern to human health and the environment and to determine if additional sampling in Padilla Bay Lagoon was necessary. This discussion focuses on the leachate analytical results. The two leachate samples were collected as grab samples from the two largest flows coming out of the landfill (Figure 9). These water samples were analyzed for approximately 400 chemicals consisting of metals, trace elements, cyanide, petroleum hydrocarbons, VOCs, PAHs, phenols, chlorinated benzene, phthalate esters, SVOCs, PCBs, organotins, pesticides, and herbicides (Table 4). According to the report a slight petroleum odor was evident in the vicinity of the landfill. However, the leachate samples appeared free of sheen. Following the analysis of the initial leachate and sediment samples, additional sediment samples were collected in Padilla Bay lagoon (sediment results are outlined in the Sediment Data Gaps report [SAIC, 2007]).

Priority pollutant metals were not detected in the leachate samples. Miscellaneous trace elements, number 2 diesel, VOCs, polycyclic aromatic hydrocarbons (PAHs), phenols, miscellaneous SVOCs, and phthalate esters were detected in the leachate samples. Manganese, benzo(a)anthracene, and PCB aroclor 1242 were detected at concentrations greater than their respective human health surface water criteria in at least one sample. No compounds were detected at concentrations greater than the aquatic life marine/chronic criteria; however, a number of metals, carcinogenic PAHs, and PCBs had elevated detection limits (i.e., they were greater than their respective surface water criteria). Number 2 diesel was detected in both seepage samples. There are no surface water quality criteria for petroleum; however, WAC 173-340-730(3)(b)(iii)(C) states that the Model Toxics Control Act (MTCA) Method A groundwater cleanup level of 500 µg/L for diesel range organics can be used to evaluate the potential noncarcinogenic effects of diesel range organics in surface water. Number 2 diesel was detected at a concentration greater than the MTCA Method A groundwater cleanup level in one of the leachate samples. High concentrations of iron (5,660 to 16,200 µg/L) were detected in the leachate samples. The EPA National Recommended Water Quality Criteria (freshwater chronic) for iron is 1,000 µg/L (EPA, 2006). There is no corresponding marine chronic criterion for iron. According to the report, high iron concentrations are expected in landfill drainage.

Chemicals of concern identified in the report include iron, petroleum, benzenes, chlorinated benzenes, toluene, xylene, ethylether, PAHs, phenols, phthalates, nitrosodiphenylamine, dibenzofuran, carbazole, dibenzothiphene, PCBs, and carbaryl.

2.6.6 Site Hazard Assessment (Skagit County, 2003)

Skagit County Health Department conducted a Site Hazard Assessment (SHA) in February 2003. According to Ecology, the March Point Landfill was placed on Ecology's Confirmed and Suspected Contaminated Sites List on March 1, 1988 (Ecology, 2002).

2.7 POTENTIAL PATHWAYS AND RECEPTORS OF CONCERN

The primary pathways of concern for human health and the environment at the March Point Landfill are: direct-contact, soil to groundwater, groundwater and leachate to surface water/sediment. At this time, the most significant receptor of concern is the migration of contaminants to Padilla Bay and Padilla Bay lagoon.

Surface Water. Previous reports have referred to small streams (estuarine streams) on the southeast, south, and southwest sides of the landfill. Because of inconsistencies within the reports and between the reports, the number of small streams adjacent to the landfill with potential to carry landfill-related contamination to Padilla Bay or Padilla Bay Lagoon is a data gap. A dry stream bed was noted by GeoEngineers on the southwest side of the landfill during the site visit on December 19, 2006. Whether or not this stream bed drains to Padilla Bay is also a data gap.

Groundwater. Groundwater migrating underneath the landfill to Padilla Bay or Padilla Bay Lagoon may provide a contaminant transport pathway to surface water and sediment. According to previous reports, shallow groundwater is likely present at or near the bottom of the landfill.

Leachate. As discussed above, leachate has been identified entering Padilla Bay lagoon at a minimum of two locations near the northeast side of the landfill.

Soil. According to previous reports, the landfill was covered with 2 to 3 feet of soil of unknown quality in 1973. As noted above, the soil used to cover the landfill has not been sampled. Additionally, no soil or groundwater samples have been tested from within the bounds of the landfill. Therefore, the potential for contaminants to migrate from sources in soil and/or groundwater within the landfill to surface water and sediment is a data gap.

3.0 POTENTIAL SOURCES OF CONTAMINATION – UPLAND SITE

3.1 SOIL

Soil samples have not been collected at the landfill. However, based on the unregulated and semiregulated nature of the landfill that operated for up to 23 years, the types of industries known or assumed to have deposited waste at the landfill, and the analytical results from the leachate, surface water, and groundwater samples collected in Padilla Bay and Padilla Bay Lagoon, soil in the landfill is a potential source of contamination.

Skagit County's 2003 SHA identified the following potential soil contaminants: metals, PCBs, pesticides, petroleum, phenols, non-halogenated solvents, dioxin, PAHs, conventional contaminants (inorganic and organic), and asbestos.

3.2 GROUNDWATER

Groundwater samples have not been collected within the landfill. However, due to the expected shallow depth beneath the landfill, groundwater is a potential source of contamination.

3.3 LEACHATE

Leachate samples have been collected adjacent to the landfill at least four times. Contaminants detected include metals, VOCs, PAHs, diesel No. 2, phenols, phthalates, n-nitrosodiphenylamine, dibenzofuran, carbazole, dibenzothiophene, and carbaryl.

Ecology's 1999 report "Investigation of Chemical Contamination at Whitmarsh Landfill and Padilla Bay Lagoon" concluded that the landfill appears to be at least partially responsible for elevated 2,3,7,8-tetrachlorodibenzo-p-dioxin detections in Padilla Bay Lagoon sediments.

4.0 SUMMARY OF DATA GAPS – UPLAND SITE

The following outlines specific data gaps related to (a) landfill extent and (b) soil, groundwater and surface water/leachate site characterization. Data gaps for this report are defined as information that is lacking and/or information that is needed to adequately develop a remedial investigation work plan and ultimately a cleanup remedy for this site. A summary of data gaps include:

- The lateral and vertical extents of the landfill are not known (details in Sections 4.1.1 and 4.1.2).
- Knowledge regarding the nature of the wastes disposed of in the landfill is limited (details in Section 4.1.3).
- No soil sampling and testing has been completed (details in Section 4.2).
- No groundwater sampling and testing has been completed (details in Section 4.3).
- Available leachate and surface water chemical analytical data do not reflect current conditions (details in Section 4.4).
- Chemical testing programs completed to date have generally not been adequate to evaluated potential contaminants of concern (details in Section 4.5).

4.1 EXTENT OF LANDFILL

4.1.1 The Lateral Extent Of Wastes Disposed Of In The Landfill Is Not Known.

The lateral extent of the area that has been filled can be approximated from a review of the aerial photographs (Figures 10 through 16). The 1937 aerial photograph shows the site before wastes were disposed of at the landfill and the 1975 aerial photograph shows the site approximately two years after the landfill was closed (Figures 10 and 13). The extent of fill in 1966 and 1969 is shown in Figures 11 and 12, respectively. The approximate lateral extent of the capped landfill is evident in both the 1975 and 1981 aerial photographs (Figures 13 and 14). However, it is not known if wastes were disposed of throughout the entire filled area. The 1992 and 2001 aerial photographs are shown in Figure 15 and 16, respectively.

4.1.2 The Vertical Extent Of The Fill And Waste In The Landfill Are Not Known.

The 2003 Site Hazard Assessment conducted by the Skagit County Health Department indicates that the "fill appears to be approximately 10-15 feet above the level of the adjacent Padilla Lagoon tidelands."

We interpret this to mean that 10 to 15 feet of waste material exists above the low-tide elevation. However, this interpretation needs to be evaluated and thus represents a data gap.

4.1.3 Knowledge Regarding The Nature Of The Wastes Disposed Of In The Landfill Is Limited.

Previous reports indicate that household waste, commercial solid waste, and industrial waste were disposed of; however, details regarding the types and volumes of wastes disposed are not available. Specific wastes referenced in previous reports include:

- "Heavy catalyst" from the Shell Refinery alkylating unit; approximately 20 barrels every three months from 1965 through 1971 (Skagit County, 2003).
- Asbestos containing material (Skagit County, 2003).
- Vanadium catalysts in a powdered form (possibly vanadium pentoxide; Ecology, 1986).
- 55-gallon drums and smaller drums/cans (1968 photograph provided by Skagit County).

4.2 SOIL

Data gaps include the lack of soil quality data in the landfill "cap" and throughout the fill itself. No soil samples collected within the lateral or vertical extent of the landfill were identified during the review of existing information.

Previous reports have indicated that 2 to 3 feet of soil were placed on top of the wastes when the landfill was closed (Ecology, 1986). The 1986 Site Inspection Report indicates that this was clean soil; however, there is no indication where the soil originated or if the soil was tested prior to placement at the site (Ecology, 1986).

4.3 GROUNDWATER

Data gaps include the lack of groundwater quality data upgradient of the landfill, within the landfill itself, and adjacent to Padilla Bay and Padilla Bay lagoon. Additionally, groundwater flow characteristics such as depth to groundwater, groundwater flow direction, groundwater gradient, tidal influences and groundwater/surface water interactions have not been evaluated. If the water table intersects the landfill waste, this would cause more rapid leaching of waste and provide a more direct pathway to surface water.

Ecology collected a water sample from the borrow pit approximately 40-feet southwest of the landfill in December 1985 (Ecology, 1986). According to Ecology, the purpose of this water sample was to evaluate groundwater upgradient of the landfill. This sample was collected over 20 years ago and is not adequate for evaluating upgradient groundwater. The analytical results from this sample are included in Table 1. Based on the review of existing information, groundwater monitoring wells have not been completed immediately upgradient of the landfill or within the landfill itself. Additionally, there are no wells within the intertidal zone to evaluate tidal influences and/or groundwater/surface water quality.

Ecology estimated that the depth to shallow groundwater was approximately 10 feet based on the elevation of water in the borrow pit. In addition, Ecology's 1986 Site Inspection Report states that a deeper aquifer may be present at a depth of 75 to 80 feet based on a review of a USGS well log from a well approximately 2,500 feet upgradient of the landfill (Ecology, 1986). However, these aquifers, if present, may be saline in the vicinity of the landfill.

4.4 LEACHATE/SURFACE WATER

Data gaps include the lack of recent leachate data and surface water data in Padilla Bay lagoon. Leachate samples, or surface water samples collected at locations where the leachate enters Padilla Bay Lagoon, were collected in 1985, 1988, 1996, and 1998 (see Tables 1 through 4).

In addition to collecting leachate samples at locations where previous leachate samples were collected, the perimeter of the landfill should be investigated to identify other leachate seeps, if present, particularly during an ebbing tide. Leachate and Padilla Bay surface water data can be used as part of the aquatic ecological evaluation.

4.5 CHEMICAL TESTING PROGRAM

The chemical analytical testing program(s) that have been completed for surface water and/or leachate samples have not been adequate to evaluate potential contaminants of concern. Future sampling and testing of media should include a list of chemicals at least as comprehensive as the testing program completed during Ecology's 1998 study. Additional chemicals of concern that directly relate to industrial processes from the industries that transported wastes to this landfill should be consulted to compile the potential chemicals of concern list (for example, at least the known hazardous substances outlined in Section 4.1.3). Additionally, current and appropriate regulatory screening criteria should be consulted for future site characterization and/or remedial investigation actions at this Site.

5.0 DOCUMENTS REVIEWED

Aero-Metric/Seattle. Air Photo Series, Nos. SKC-01 6-8, SWS-92 17-27, SSI-81 9B-2, SKC-75 9-10, and SWI-69 9-28.

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6.0 LIMITATIONS

This plan has been prepared for use by SAIC (GeoEngineers is subcontracted to SAIC for Ecology Contract # C0700034), its authorized agents and Washington State Department of Ecology. The information contained herein is not intended for use by others and it is not applicable to other sites. No other (third) party may rely on the product of our services unless we agree in advance and in writing to such reliance. This plan can be provided to contractors, maintenance and utility personnel or other third parties for informational purposes only. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

Our interpretation of subsurface conditions at the site is based on field observations and chemical data from widely-spaced sampling locations. It is always possible that contamination exists in areas of the site that were not explored, sampled or analyzed.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers Inc. and will serve as the official document of record.

TABLE 1

1986 ECOLOGY SITE INSPECTION REPORT - WATER SAMPLES[1]

MARCH POINT LANDFILL
ANACORTES, WASHINGTON

Analytes	Sample ID				Surface Water Criteria[2]		
	NCT091 (Surface Water) Figure 9 - Location 1A	NCT092 (Surface Water) Figure 9 - Location 1B	NCT094 (Surface Water) Figure 9 - Location 1C	NCT095 (Leachate) Figure 9 - Location 1D	Aquatic Life Marine/Chronic[3]	Human Health Marine[4]	MTCA Method B[5]
Dissolved Metals - EPA Method Not Known (µg/L)							
Antimony	<1	<1	<1	<1	--	640	1000
Arsenic	**5**	<1	**74**	**2**	36	0.14	0.098
Beryllium	<0.1	<0.1	**14.2**	<0.1	--	--	270
Cadmium	<0.2	<0.2	<0.2	<0.2	8.8	--	20
Chromium	<1	<1	<1	<1	50	--	490
Copper	**7**	**11**	**2**	**1**	2.4	--	2700
Lead	<1	<1	<1	<1	8.1	--	--
Mercury	**0.06**	**0.06**	<0.06	<0.06	0.025	0.15	--
Nickel	**5**	**100**	**40**	**6**	8.2	4600	1100
Selenium	**2**	<1	**62**	**5**	71	4200	2700
Silver	<0.1	<0.1	<0.1	<0.1	--	--	26000
Telurium	**1**	<1	**24**	**3**	--	--	--
Zinc	<1	**32**	**3**	**22**	81	26000	17000
Phenolics - EPA Method Not Known (mg/L)							
Phenolics	0.030	0.005	0.010	0.020	--	--	--
Volatile Organic Compounds - EPA Method Not Known (µg/L)							
Benzene	<1	<1	<1	13	--	51	23

Notes:

[1]Ecology, 1986

[2]Surface water criteria identified in WAC 173-340-730(3)(b)(i) The surface water criteria are being used in this report for screening purposes, and are not intended to represent proposed or final cleanup levels.

[3]Lowest available aquatic life marine chronic criteria from Chapter 173-201A Clean Water Act Section 304 and National Toxics Rule (40 CFR

[4]Lowest available human health marine criteria from Clean Water Act Section 304 and National Toxics Rule (40 CFR 131)

[5]MTCA Method B surface water cleanup level [WAC 173-340-730(3)(b)(iii)]

-- = not available
nd = not detected
n/a = not analyzed or not applicable
bold indicates a detected concentration
underline indicates that detection limit is greater than at least one surface water criteria
shading indicates that detected concentration is greater than at least one surface water criteria

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TABLE 2

1989 ECOLOGY LETTER - LEACHATE SAMPLE[1]

MARCH POINT LANDFILL

ANACORTES, WASHINGTON

Analytes	Sample ID 88-257426 Figure 9 - Location 2	Surface Water Criteria[2] Aquatic Life Marine/Chronic[3]	Human Health Marine[4]	MTCA Method B[5]
Metals - EPA Method Unknown (µg/L)				
Antimony[6]	1U	--	640	1,000
Arsenic[6]	**91**	36	0.14	0.098
Beryllium[7]	**8.5**	--	--	270
Cadmium[7]	**9.9**	8.8	--	20
Chromium[7]	**324**	50	--	490
Copper[7]	**357**	2.4	--	2,700
Lead[6]	**126**	8.1	--	--
Mercury[6]	--	0.025	0.15	--
Nickel[7]	**959**	8.2	4,600	1,100
Selenium[6]	1U	71	4,200	2,700
Silver[6]	**2.2**	--	--	26,000
Thallium[6]	**1.8**	--	0.47	--
Zinc[7]	**779**	81	26,000	17,000

Notes:

[1]Ecology, 1989

[2]Surface water criteria identified in WAC 173-340-730(3)(b)(i) The surface water criteria are being used in this report for screening purposes, and are not intended to represent proposed or final cleanup levels

[3]Lowest available aquatic life marine chronic criteria from Chapter 173-201A, Clean Water Act Section 304, and National Toxics Rule (40 CFR 131)

[4]Lowest available human health marine criteria from Clean Water Act Section 304 and National Toxics Rule (40 CFR 131)

[5]MTCA Method B surface water cleanup level [WAC 173-340-730(3)(b)(iii)]

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nd = not detected

n/a = not analyzed or not applicable

bold indicates a detected concentration

shading indicates that detected concentration is greater than at least one surface water criteria

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TABLE 3

1996 SKAGIT COUNTY HEALTH DEPARTMENT LETTER - LEACHATE SAMPLES[1]

MARCH POINT LANDFILL
ANACORTES WASHINGTON

Analytes	Sample ID		Surface Water Criteria[2]		
	MW-1 Figure 9 - Location 3A	MW-2 Figure 9 - Location 3B	Aquatic Life Marine/Chronic[3]	Human Health Marine[4]	MTCA Method B[5]
Volatile Organic Compounds - EPA Method 8260 (µg/L)					
Benzene	**6**	**2J**	--	51	23
Chlorobenzene	**15**	**1J**	--	1,600	5,000
m,p-xylenes	**3**	**1J**	--	--	--
o-xylene	**3**	3U	--	--	--
acetone	5U	5U	--	--	--
Carbon disulfide	3U	3U	--	--	--
Methylene chloride	3U	3U	--	--	--
2-Butanone	5U	5U	--	--	--
4-Methyl-2-pentanone	5U	5U	--	--	--
Toluene	**2J**	3U	--	15,000	19,000
2-Hexanone	5U	5U	--	--	--
Semivolatile Organic Compounds - EPA Method 8270 (µg/L)					
2,4-Dimethylphenol	**3**	1U	--	850	550
Naphthalene	**2**	1U	--	--	4,900
2-Methylnaphthalene	**1**	1U	--	--	--
n-Nitrosodiphenylamine	1U	**1**	--	6	9.7
Bis(2-ethylhexyl)phthalate	1U	**1**	--	2.2	3.6
Fluoranthene	1U	1U	--	140	90
Pyrene	1U	1U	--	4,000	2,600
Benzo(a)anthracene	1U	1U	--	0.018	0.03
Chrysene	1U	1U	--	0.018	0.03
Benzo(b)fluoranthene	1U	1U	--	0.018	0.03
Benzo(k)fluoranthene	1U	1U	--	0.018	0.03
Pesticides/PCBs - EPA Method 8080	nd	nd	--	--	--
Phenol - EPA Method 420.2 (mg/L)					
Total phenol (mg/L)	**10**	5U	--	--	--
Metals - EPA 6000/7000 Series Methods (µg/L)					
Antimony	6U	3U	--	640	1,000
Arsenic	5U	5U	36	0.14	0.098
Beryllium	10U	10U	--	--	270
Cadmium	10U	10U	8.8	--	20
Chromium	10U	10U	50	--	490
Copper	10U	10U	2.4	--	2,700
Cyanide	5U	5U	--	--	--
Lead	50U	50U	8.1	--	--
Mercury	0.2U	0.2U	0.025	0.15	--
Nickel	20U	20U	8.2	4,600	1,100
Selenium	5U	5U	71	4,200	2,700
Silver	10U	10U	--	--	26,000
Thallium	1U	1U	--	--	--
Zinc	**26**	**31**	81	26000	17000
Cyanide - EPA Method 335.3 (mg/L)					
Cyanide	5U	5U	--	--	--

Notes:

[1]Skagit County, 1996

[2]Surface water criteria identified in WAC 173-340-730(3)(b)(i). The surface water criteria are being used in this report for screening purposes, and are not intended to represent proposed or final cleanup levels

[3]Lowest available aquatic life marine chronic criteria from Chapter 173-201A Clean Water Act Section 304 and National Toxics Rule (40 CFR 131)

[4]Lowest available human health marine criteria from Clean Water Act Section 304 and National Toxics Rule (40 CFR 131)

[5]MTCA Method B surface water cleanup level [WAC 173-340-730(3)(b)(iii)]

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TABLE 4

1999 ECOLOGY REPORT - LEACHATE SAMPLES[1]

MARCH POINT LANDFILL
ANACORTES WASHINGTON

Analytes	Sample ID 248005 Figure 9 - Location 4A	Sample ID 248006 Figure 9 - Location 4B	Surface Water Criteria[2] Aquatic Life Marine/Chronic[3]	Surface Water Criteria[2] Human Health Marine[4]	MTCA Method B[5]
Priority Pollutant Metals - EPA Method 200.7 (µg/L)					
Antimony	30 UJ	30 U	--	640	1000
Arsenic	30 U	30 U	36	0.14	0.098
Beryllium	1 U	1 U	--	--	270
Cadmium	4 U	4 U	8.8	--	20
Chromium	5 U	5 U	50	--	490
Copper	5 U	5 U	2.4	--	2700
Lead	20 U	20 U	8.1	--	--
Mercury - EPA Method 245.1	0.05 U	0.05 U	0.025	0.15	--
Nickel	15 U	15 U	8.2	4600	1100
Selenium	40 U	40 U	71	4200	2700
Silver	4 U	4 U	--	--	26000
Thallium	50 U	50 U	--	0.47	--
Zinc	5 U	5 U	81	26000	17000
Miscellaneous Trace Elements - EPA Method 200.7 (µg/L)					
Aluminum	**106**	**39**	--	--	--
Barium	**103**	**162**	--	--	--
Calcium	**43,400**	**54,500**	--	--	--
Cobalt	5 U	5 U	--	--	--
Iron	**5,660**	**16,200**	--	--	--
Magnesium	**37,300**	**31,400**	--	--	--
Manganese	**127**	**234**	--	100	--
Molybdenum	**7.4**	5 U	--	--	--
Potassium	**17,400**	**15,500**	--	--	--
Sodium	**137,000**	**86,200**	--	--	--
Strontium	**402**	**369**	--	--	--
Titanium	5 U	5 U	--	--	--
Vanadium	5 U	5 U	--	--	--
Cyanide - EPA Method 4500CNC (µg/L)	5 U	5 U	1	16,000	22,500
Total Petroleum Hydrocarbons - EPA Method 8000, 8015 (µg/L)					
#2 Diesel	**850**	**470**	--	--	500[6]
Lube Oil	80 U	80 U	--	--	--
Gasoline	120 U	120 U	--	--	--
Volatile Organic Compounds - EPA Method 8260 (µg/L)					
Benzene	**2.5**	**1.6**	--	51	23
Ethylbenzene	**0.10 J**	1.0 U	--	2,100	6,900
Isopropylbenzene	**0.15 J**	**0.29 J**	--	--	--
Chlorobenzene	**0.55**	**0.92 J**	--	1,600	5,000
1,2-Dichlorobenzene	**0.33 J**	**0.28 J**	--	1,300	4,200
1,4-Dichlorobenzene	**0.52 J**	**0.42 J**	--	190	4.9
1,2,4-Trimethylbenzene	**0.79 J**	1 U	--	--	--
1,3,5-Trimethylbenzene	**0.14 J**	1 U	--	--	--
Toluene	**0.86 J**	**0.15 J**	--	15,000	19,000
m,p-Xylenes	**1.2 J**	**0.41 J**	--	--	--
o-Xylene	**1.3 J**	**0.14 J**	--	--	--
Naphthalene	**2.1**	1 U	--	--	4,900
Ethylether	1 U	**0.51 J**	--	--	--
Low Molecular Weight Polycyclic Aromatic Hydrocarbons - EPA Method 8270 (µg/L)					
Naphthalene	**0.84**	**0.09 J**	--	--	4,900
1-Methylnaphthalene	**0.49**	**0.52**	--	--	--
2-Methylnaphthalene	**0.39**	**0.28**	--	--	--
2,6-Dimethylnaphthalene	**0.10 J**	**0.15**	--	--	--
1,6,7-Trimethylnaphthalene	0.12 U	**0.02 J**	--	--	--
Acenaphthalene	**0.42**	**0.24**	--	990	640
Fluorene	**0.26**	**0.16**	--	5,300	3,500
Phenanthrene	**0.24**	**0.06 J**	--	--	--
1-Methylphenanthrene	0.12 U	**0.02 J**	--	--	--
2-Methylnphenanthrene	**0.04 J**	**0.02 J**	--	--	--
Anthracene	**0.04 J**	**0.03 J**	--	40,000	26,000
High Molecular Weight Polycyclic Aromatic Hydrocarbons - EPA Method 8270 (µg/L)					
Fluoranthene	**0.07 J**	**0.02 J**	--	140	90
Pyrene	**0.04 J**	**0.04 J**	--	4,000	2,600
Benzo(a)anthracene	**0.03 J**	0.12 U	--	0.018	0.03
Chrysene	0.12 U	0.12 U	--	0.018	0.03
Benzo(b)fluoranthene	0.12 U	0.12 U	--	0.018	0.03
Benzo(k)fluoranthene	0.25 U	0.25 U	--	0.018	0.03
Benzo(e)pyrene	0.12 U	0.12 U	--	--	--
Benzo(a)pyrene	0.25 U	0.25 U	--	0.018	0.03
Perylene	0.12 U	0.12 U	--	--	--
Indeno(1,2,3-cd)pyrene	0.62 U	0.62 U	--	0.018	0.03

TABLE 4

1999 ECOLOGY REPORT - LEACHATE SAMPLES[1]

MARCH POINT LANDFILL
ANACORTES WASHINGTON

Analytes	Sample ID 248005 Figure 9 - Location 4A	Sample ID 248006 Figure 9 - Location 4B	Surface Water Criteria[2] Aquatic Life Marine/Chronic[3]	Surface Water Criteria[2] Human Health Marine[4]	Surface Water Criteria[2] MTCA Method B[5]
Benzo(g,h,i)perylene	0.12 U	0.12 U	--	--	--
Phenols EPA Method 8270 (µg/L)					
Phenol	**0.08 J**	0.12 U	--	1,700,000	1,100,000
2-Methylphenol	**0.16**	0.25 U	--	--	--
4-Methylphenol	**0.30**	**0.10 J**	--	--	--
2,4-Dimethylphenol	0.12 U	0.12 U	--	850	550
4-Chloro-3-methylphenol	**0.52**	0.12 U	--	--	--
Chlorinated Benzenes - EPA Method 8260 (µg/L)					
1,2-Dichlorobenzene	**0.18**	**0.13**	--	1,300	4,200
1,3-Dichlorobenzene	**0.01 J**	0.25 U	--	960	--
1,4-Dichlorobenzene	**0.34**	**0.24**	--	190	4.9
Phthalate Esters - EPA Method 8270 (µg/L)					
Diethylphthalate	**0.19 J**	**0.14 J**	--	44,000	28,000
Di-n-butylphthalate	0.12 U	0.12 U	--	4,500	2,900
Bis(2-ethylhexyl)phthalate	0.12 U	0.25 U	--	2.2	3.6
Miscellaneous Semivolatiles - EPA Method 8270 (µg/L)					
n-Nitrosodiphenylamine	**0.41**	**1.5**	--	6	9.7
Dibenzofuran	**0.16**	**0.08 J**	--	--	--
Carbazole	**0.18**	**0.18**	--	--	--
Dibenzothiophene	0.12 U	**0.05 J**	--	--	--
3B-Coprostanol	0.62 U	0.62 U	--	--	--
Retene	0.25 U	0.25 U	--	--	--
PCBs - EPA Method 8080 (µg/L)					
Aroclor 1016	0.033 UJ	0.034 UJ	0.03	0.000064	0.00011
Aroclor 1221	0.033 UJ	0.034 UJ	0.03	0.000064	0.00011
Aroclor 1232	0.033 UJ	0.034 UJ	0.03	0.000064	0.00011
Aroclor 1242	**0.028 J**	**0.011 J**	0.03	0.000064	0.00011
Aroclor 1248	0.033 UJ	0.034 UJ	0.03	0.000064	0.00011
Aroclor 1254	0.033 UJ	0.034 UJ	0.03	0.000064	0.00011
Aroclor 1260	0.033 UJ	0.034 UJ	0.03	0.000064	0.00011
Nitrogen-Containing Pesticides - EPA Method 8085 (µg/L)					
Carbaryl	**4.5 J**	**0.13 J**	--	--	--
Organophosphoruous Pesticides - EPA Me	nd	nd	--	--	--
Organochlorine Pesticides - EPA Method 8	nd	nd	--	--	--
Carbamate Pesticides - EPA Method 531.1 (µg/L)					
Carbaryl	**5.8 J**	**0.12 J**	--	--	--
Herbicides - EPA Method 8085 (µg/L)	nd	nd	--	--	--

Notes:

[1]Ecology 1999

[2]Surface water criteria identified in WAC 173-340-730(3)(b)(i) The surface water criteria are being used in this report for screening purposes, and are not intended to represent proposed or final cleanup levels

[3]Lowest available aquatic life marine chronic criteria from Chapter 173-201A Clean Water Act Section 304, and National Toxics Rule (40 CFR 131)

[4]Lowest available human health marine criteria from Clean Water Act Section 304 and National Toxics Rule (40 CFR 131)

[5]MTCA Method B surface water cleanup level [WAC 173-340-730(3)(b)(iii)]

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Photo 1: Saw Mill Looking Northwest

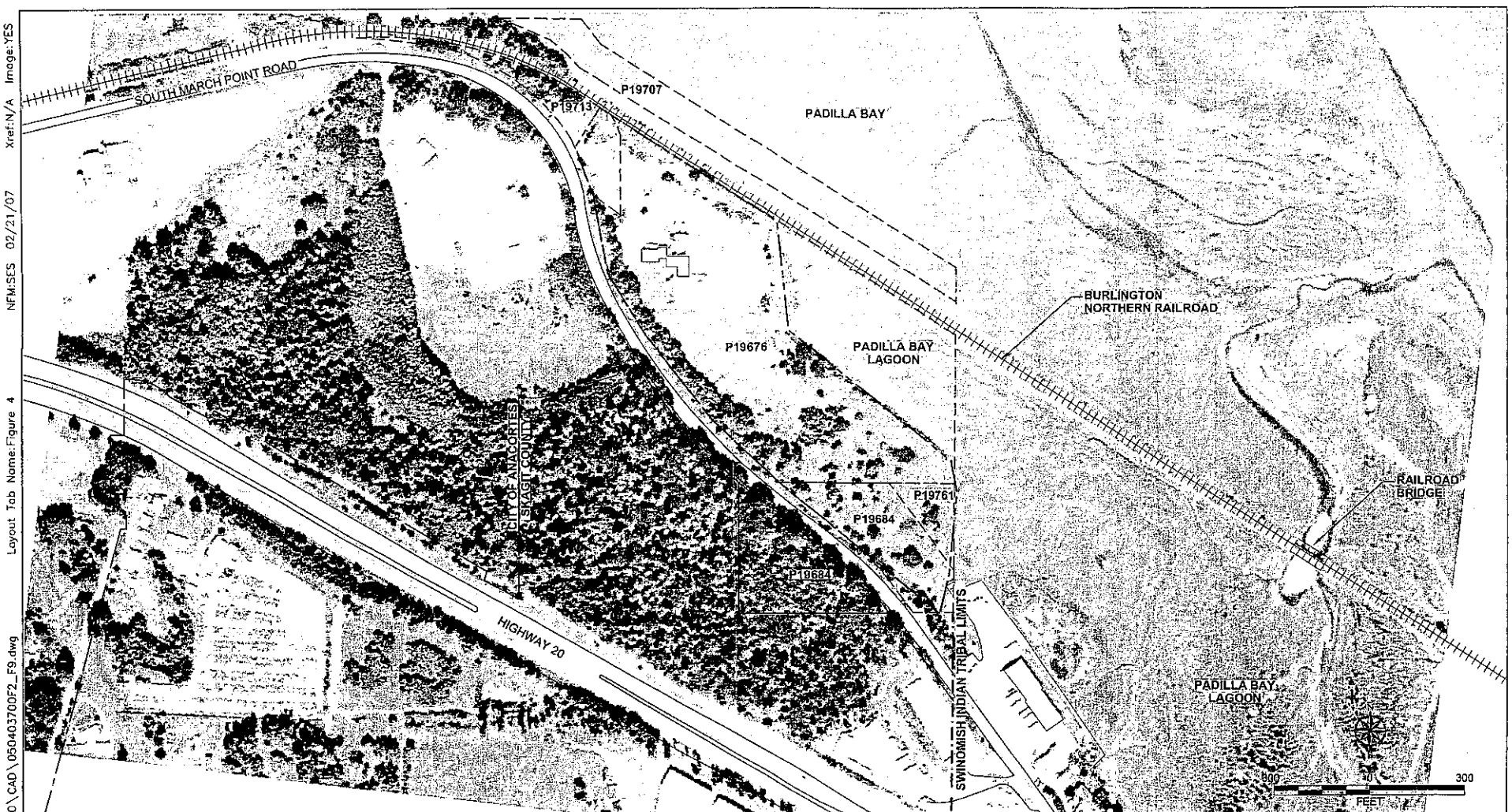
Photo 3: Padilla Bay Lagoon Looking Southeast

Photo 2: West of Saw Mill Looking Southeast

Photo 4: Landfill Dike Looking Southwest

FIGURE 3 – 2006 SITE PHOTOGRAPHS

Whitmarsh Landfill, Anacortes, Washington



Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

References: Drawing base from aerial photographs from Aero-Metric/Seattle

Legend:

- Approximate Landfill Boundary
- Parcel Boundary
- P 19713 Parcel Number
- City / County Line
- Tribal Boundary

Tax Parcels

Whitmarsh Landfill
Anacortes, Washington

GeoEngineers | Figure 4

Approaching Whitmarsh Dump on March Point Road

12-13-68

Whitmarsh Dump by Jack Wai

12-13-68

Whitmarsh

12-13-68

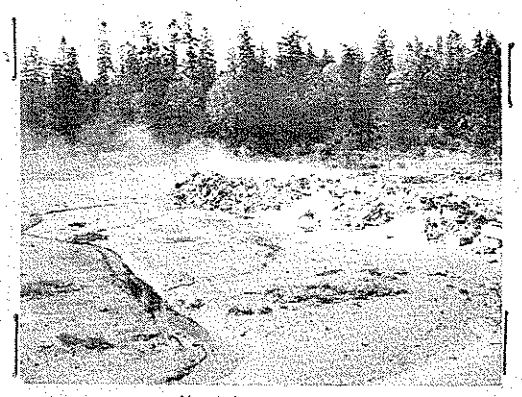
Photographs Obtained From Skagit County Health Department

GeoEngineers

FIGURE 5 – Historic Photographs (1968-1970)

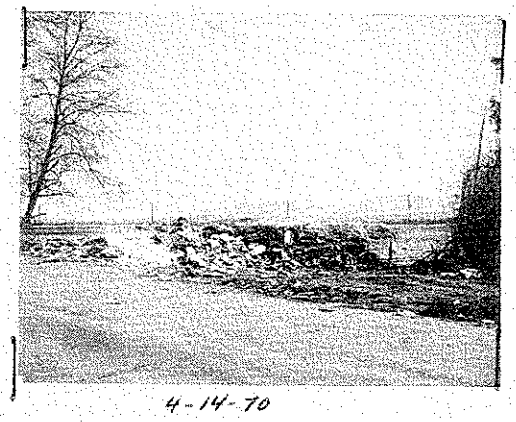
Whitmarsh Landfill, Anacortes, Washington

Whitmarsh Dump by Jack Wall



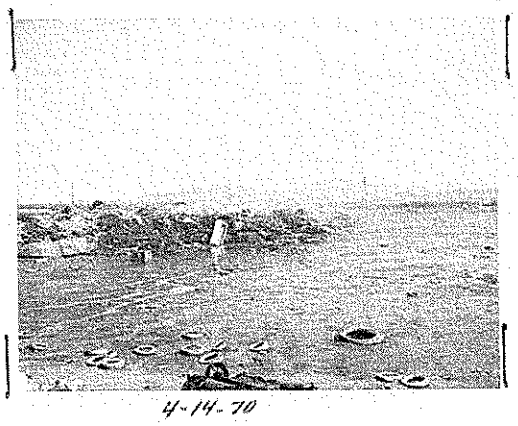
4-14-70

Whitmarsh



4-14-70

Whitmarsh



4-14-70

Photographs Obtained From Skagit County Health Department

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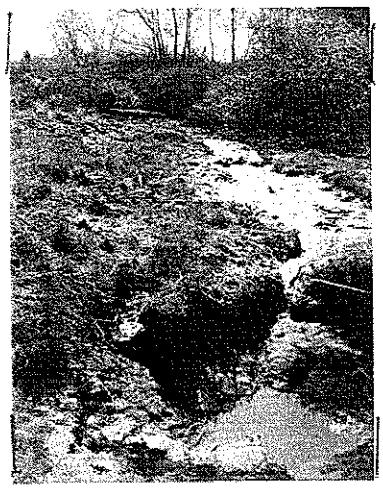
GeoEngineers

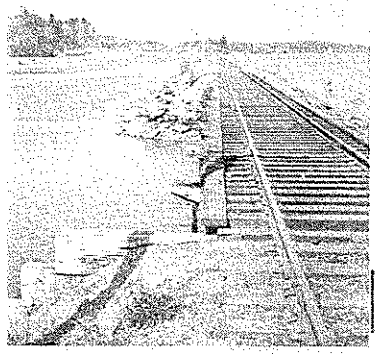
FIGURE 6 – Historic Photographs (1968-1970)

Whitmarsh Landfill, Anacortes, Washington



Near Whitmarsh by David Kurz

4-14-70



4-14-70

Looking back at Whitmarsh Dump by David Kurz

4-14-70

Photographs Obtained From Skagit County Health Department

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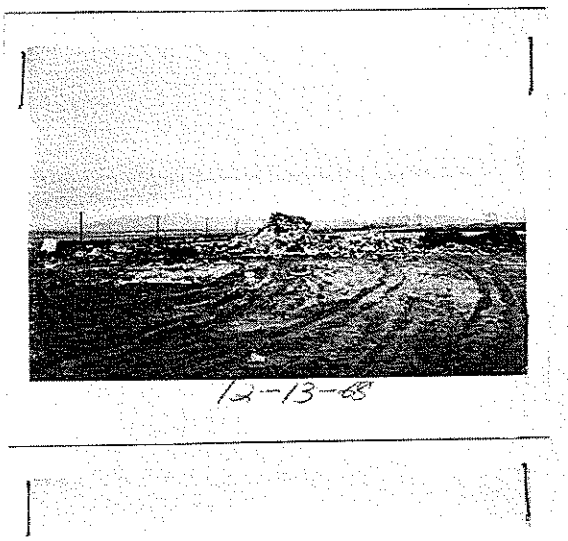
GeoEngineers

FIGURE 7 – Historic Photographs (1968-1970)

Whitmarsh Landfill, Anacortes, Washington



Photographs Obtained From Skagit County Health Department

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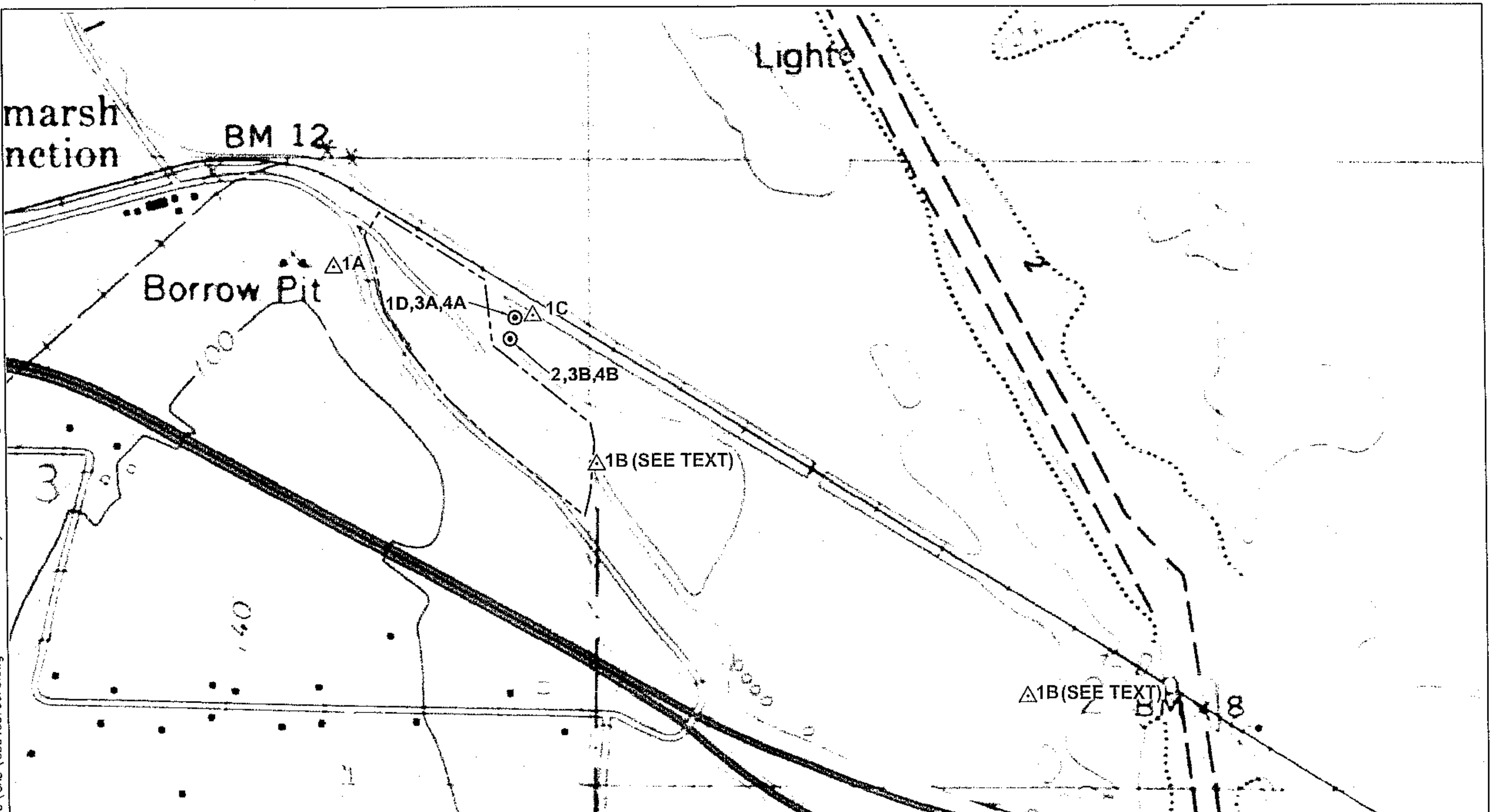
FIGURE 8 – Historic Photographs (1968-1970)

Whitmarsh Landfill, Anacortes, Washington



Notes:
1. The locations of all features shown are approximate. 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Drawing base USGS 7.5 topographic quadrangle map, Anacortes South, WA. 1978.

Legend:
- Approximate Landfill Boundary
- 1D ⊙ Location of Previous Leachate Water Sample
- 1A △ Location of Previous Surface Water Sample
- 1A △ Surface Water Exceedance
- 1D ⊙ Leachate Exceedance

Key
1 = Ecology, 1986
2 = Ecology, 1988
3 = Skagit County, 1996
4 = Ecology, 1999

500 0 500 FEET

Previous Leachate / Surface Water Sample Locations

Whitmarsh Landfill
Anacortes, Washington

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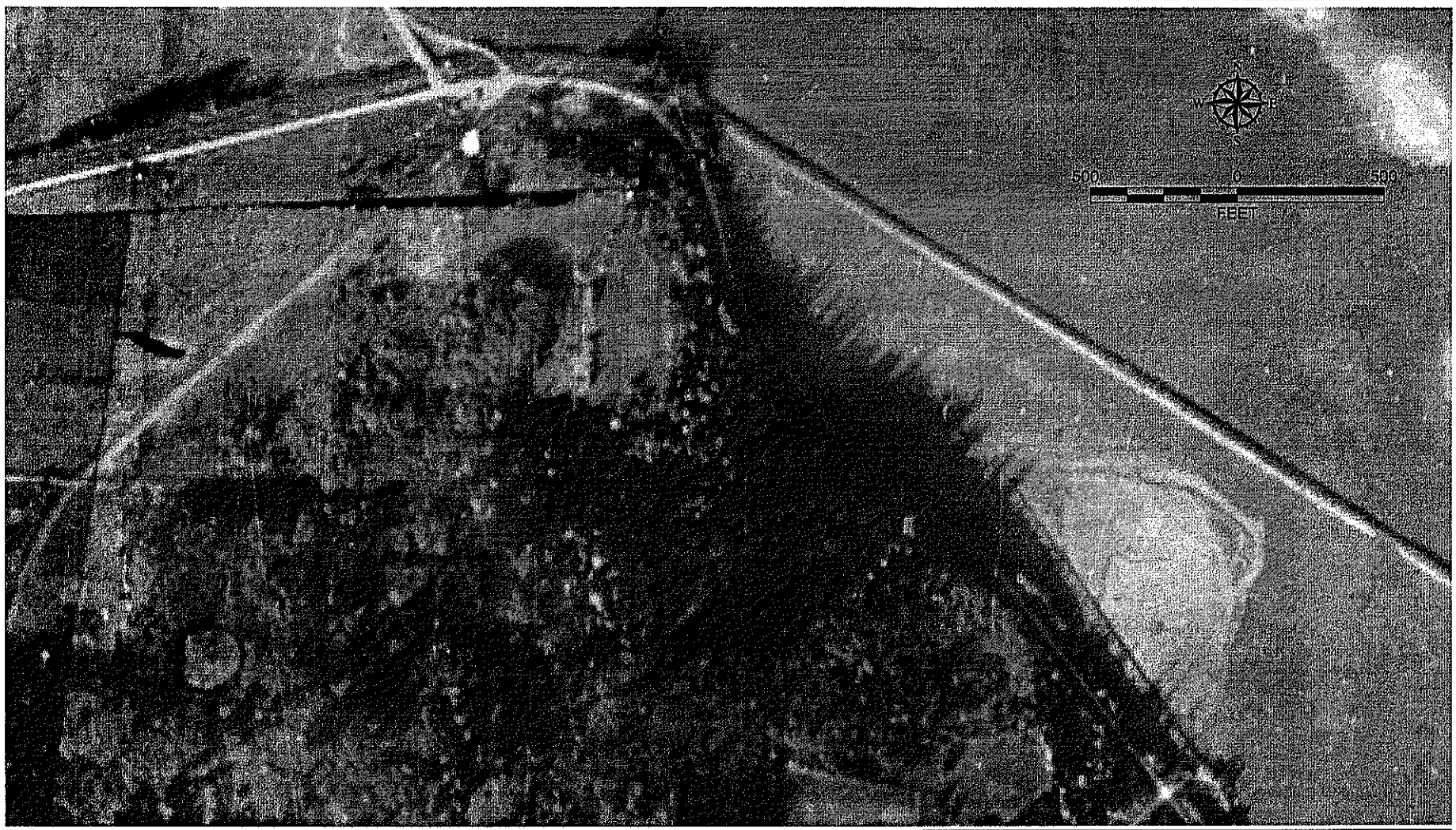
Figure 9

SEAT \P:\ 0504037\00\CAD\050403700F2_F9.dwg Layout Tab Name:Figure 10 NFM:SES 02/15/07 Xref:N/A Image:YES



Notes:

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Reference: Image from Skagit County Web site:
http://www.skagitcounty.net/Common/Asp/Default.asp?d=GIS&c=General&p=Digital/main.htm

Aerial Photograph 1937

Whitmarsh Landfill
Anacortes, Washington

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Figure 10

SEAT \P:\ 0504037\00\CAD\050403700F2_F9.dwg Layout Tab Name:Figure 11 NFM:SES 02/15/07 Xref:N/A Image:YES

Notes:

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Reference: Drawing base from aerial photographs from Washington State Department of Transportation.

Aerial Photograph 1966

Whitmarsh Landfill
Anacortes, Washington

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Figure 11

SEAT \P:\ 0504037\00\CAD\050403700F2_F9.dwg Layout Tab Name:Figure 12 NFM:SES 02/19/07 Xref:N/A Image:YES

Notes:

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Reference: Drawing base from aerial photographs from Aero-Metric/Seattle.

Aerial Photograph 1969

Whitmarsh Landfill
Anacortes, Washington

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Figure 12

Notes:

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Reference: Drawing base from aerial photographs from Aero-Metric/Seattle.

Aerial Photograph 1975

Whitmarsh Landfill
Anacortes, Washington

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Figure 13

SEAT \P:\ 0504037\00\CAD\050403700F2_F9.dwg Layout Tab Name:Figure 14 NFM:SES 02/19/07 Xref:N/A Image:YES

Notes:

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Reference: Drawing base from aerial photographs from Aero-Metric/Seattle.

Aerial Photograph 1981

Whitmarsh Landfill
Anacortes, Washington

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Figure 14

Notes:

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Reference: Drawing base from aerial photographs from Aero-Metric/Seattle.

Aerial Photograph 1992

Whitmarsh Landfill
Anacortes, Washington

GeoEngineers

Figure 15

SEAT \P:\ 0504037\00\CAD\050403700F2_F9.dwg Layout Tab Name:Figure 16 NFM:SES 02/19/07 Xref:N/A Image:YES

Aerial Photograph 2001

Whitmarsh Landfill
Anacortes, Washington

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Figure 16

Notes:

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Reference: Drawing base from aerial photographs from Aero-Metric/Seattle.

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APPENDIX A
REPORT LIMITATIONS AND GUIDELINES FOR USE

APPENDIX A

REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

READ THESE PROVISIONS CLOSELY

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

THIS ENVIRONMENTAL REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

This report has been prepared for SAIC and Washington State Department of Ecology. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you.
- not prepared for your project.
- not prepared for the specific site explored.
- completed before important project changes were made.

If important changes are made to the project or site after the date of this report, GeoEngineers should be retained to review our interpretations and recommendations and to provide written modifications or confirmation, as appropriate.

RELIANCE CONDITIONS FOR THIRD PARTIES

No third party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the client and generally accepted environmental practices in this area at the time this report was prepared.

HISTORICAL INFORMATION PROVIDED BY OTHERS

GeoEngineers makes no warranties or guarantees regarding the accuracy or completeness of information provided or compiled by others. The information presented in this report is based on the above-described research and a single recent site visit. GeoEngineers has relied upon information provided by others in our description of historical conditions and in our review of regulatory databases and files. The available data do not provide definitive information with regard to all past uses, operations or incidents at the site or adjacent properties.

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

UNCERTAINTY REMAINS EVEN AFTER THIS STUDY IS COMPLETED

No study can wholly eliminate uncertainty regarding the potential for recognized environmental conditions (RECs) in connection with a property. There is always a potential that areas with contamination that were not identified during this study exist at the site or in the study area. Further evaluation of such potential would require additional research, subsurface exploration, sampling and/or testing.

ENVIRONMENTAL REGULATIONS ARE ALWAYS EVOLVING

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

SITE CONDITIONS CAN CHANGE

This environmental report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report so that GeoEngineers may evaluate reliability of the report to changed conditions.

GEOTECHNICAL, GEOLOGIC AND ENVIRONMENTAL REPORTS SHOULD NOT BE INTERCHANGED

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

BIOLOGICAL POLLUTANTS

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If you desire these specialized services, they should be obtained from a consultant who offers services in this specialized field.