

Sunnyside Municipal Airport Pesticide Spray Shed

Revised Focused Feasibility Study Sunnyside, Washington

June 2025

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SIGNATURE



This report, and Mott MacDonald's work contributing to this report, were reviewed by the undersigned and approved for release.

Janet N. Knox Licensed Geologist Washington State Geologist No. 413

Executive summary

Pacific Groundwater Group (now part of Mott MacDonald) is pleased to submit this Focused Feasibility Study to the Washington Department of Ecology. This Focused Feasibility Study presents five remedial alternatives to address pesticide and nitrate impacts at the Sunnyside Municipal Airport Pesticide Spray Shed site in Sunnyside, Washington. Historic spray operator use is believed to have resulted in releases of pesticides resulting in soil and groundwater concentrations above state cleanup levels. Nitrate concentrations in groundwater are also above background at the site but appear to be at background concentrations at the downgradient property boundary. The extent of contamination above cleanup and background levels is limited to the Sunnyside Municipal Airport property based on existing data.

Remediation at the site is required by the Model Toxics Control Act (MTCA) to reduce risk to human health and the environment. The routes of potential exposure are direct contact with contaminated soil, and offsite migration to groundwater receptors. The screening of remedial technologies for pesticide contamination finds that no individual cleanup technology is likely to be completely effective at the site. This is due to the diversity of chemical characteristics of the site contaminants, access limitations presented by buildings over contaminated areas, logistical challenges presented by excavating below the water table, and low hydraulic conductivity of the silty sand at the water table. Therefore, the considered remedial alternatives incorporate combinations of technologies to achieve remediation goals. The five remedial alternatives and estimated planning-level costs are:

- Alternative 1: Excavation with Groundwater Treatment (\$1.8 million)
- Alternative 2: Targeted Excavation with Groundwater Treatment (\$1.3 million)
- Alternative 3: Containment with Groundwater Monitoring (\$0.7 million)
- Alternative 4: Containment with Groundwater nZVI Treatment (\$1.2 million)
- Alternative 5: Targeted Excavation with Containment (\$1.3 million)

All of the alternatives leave some contaminant mass in place that will likely require 60 to 90 years to naturally decrease to cleanup levels. Therefore, all alternatives include long-term compliance groundwater monitoring to track changes in groundwater concentrations and to confirm that the site remains protective of potential downgradient receptors.

Alternative 3 is the preferred remedial action based on the relative costs and environmental benefits, as evaluated through the MTCA disproportionate cost analysis process. Alternative 3 includes limited excavation of impacted soils concurrent with installation of an asphalt cap over contamination that would be left in place. Natural degradation of remaining contaminants may take on the order of 90 years, during which time groundwater monitoring would be required. With Ecology concurrence, Alternative 3 will be further developed in the draft Cleanup Action Plan (dCAP).

1 Introduction

The Sunnyside Municipal Airport serves the City of Sunnyside and surrounding agricultural areas and is located on the eastern edge of the city (Figures 1 and 2). It is owned by the City of Sunnyside. Portions of the airport have been used since the 1940s for crop duster operations including tank filling and aircraft spray down. Ecology confirmed the presence of pesticide-impacted soil in 2010 near a former pesticide storage shed. Pacific Groundwater Group conducted a Remedial Investigation for the City of Sunnyside, which was accepted by Ecology on December 8, 2014 (PGG, 2014; Ecology, 2014).

The primary objective of the Focused Feasibility Study (FFS) is to describe remedial alternatives to address contamination at the site and select a preferred remedial alternative consistent with the Model Toxics Control Act (MTCA). The remedial alternatives are described and compared in Sections 3 through 6 with Cost Estimates provided as Appendix A. Pending Ecology concurrence, the preferred alternative will form the basis for development of a Cleanup Action Plan and remedial action.

The City presents this draft FFS in accordance with Agreed Order DE 9746, as amended effective September 1, 2015.

This work was performed, our findings obtained, and this report prepared, using generally accepted environmental practices used at this time and in this vicinity, for exclusive application to this study, and for the exclusive use of the City of Sunnyside. This in lieu of other warranties, express or implied.

1.1 General Facility Information

Site Name:	Sunnyside Municipal Airport Pesticide Spray Shed
Site Address:	3318 Edison Road, Sunnyside, WA 98944
Parcel Number:	23102924003
Facility/Site ID:	20367
Cleanup Site ID:	11423
Agreed Order Number:	DE 9746

2 Site Background

Sunnyside Municipal Airport has been active since at least the 1940s. The airport was originally a dirt strip with later paving of the runway and taxiways. The site is currently used for civilian aviation including support for crop dusting operations and operation of other small aircraft. The site is level and is not paved beyond the edges of the asphalt taxiway.

A remedial investigation (RI) was conducted at the site in response to a citizen report to Ecology and subsequent confirmation of pesticide impacts at the site. The RI delineated an area of impacted soil and groundwater at and around a former pesticide spray shed and aircraft spray down area (PGG, 2014). Anecdotal reports also indicate that there may be buried debris at the site including pesticide storage cans and other metal debris. What are likely pesticide cans were observed during excavation at the site in 2010 and were left in-place. A geophysical survey of the site conducted during the RI is consistent with the presence of pockets of buried metal. Supplemental groundwater sampling conducted in 2015 to confirm groundwater pesticide concentrations also discovered elevated nitrate concentrations in groundwater above background levels (Section 2.1).

Constituents of concern and the nature and extent of soil and groundwater contamination are summarized in Tables 1 through 3 and Figure 3.

2.1 Supplemental Data Collection

Additional monitoring and investigation were conducted after the RI, including:

- A supplemental groundwater monitoring event was conducted on August 26, 2015 at groundwater monitoring wells SMW-1, SMW-2, and SMW-3 to supplement data on groundwater pesticide and herbicide concentrations. A non-petroleum odor was noted during sampling at SMW-3 and nitrate (an added analyte) was detected above expected background and above the screening level (10 mg/L) based on the maximum contaminant limit.
- A supplemental nitrate investigation was conducted in December 2015 including installation of monitoring well SMW-4 at the southern property boundary. Direct push groundwater sampling was also used to investigate the extent of elevated nitrate in groundwater and background concentrations. Sampling and analytical details are included in the September and December 2015 monthly progress reports (PGG 2015, 2016a, 2016b).
- An additional upgradient direct-push groundwater sample was collected in the sand and gravel unit on August 25, 2016.
- Four test pits were excavated on August 25, 2016 at the locations of geophysical anomalies identified during the RI. The purpose of the test pits was to determine if the geophysical anomalies were related to buried pesticide containers.
- The first quarter of the interim groundwater monitoring was conducted on April 12, 2017 (PGG, 2017).

The supplemental investigations confirmed pesticide and herbicide concentrations above screening levels at the water table in SMW-1, SMW-2, and SMW-3 and at concentrations consistent with the RI findings. Analytical results at SMW-4, which is completed in the deeper sand and gravel unit, included a single detection above screening levels. This suggests that

groundwater impacts do not extend beyond the southern property boundary, consistent with the conceptual model in the RI.

Nitrate was not included as a constituent of concern in the RI and thus the supplemental investigations are used to update site characterization for this FFS. Nitrate concentrations range from 3.3 to 190 mg/L at the site, with the highest concentrations detected at SMW-3. Groundwater nitrate concentrations are regionally elevated and background at the site appears to be somewhat variable between 10 and 20 mg/L (PGG, 2016). The extent of nitrate groundwater impacts appears to be centered near what is now the location of the metal building and extends west of the pesticide extent of contamination. Groundwater samples collected at the southern property boundary at the water table in the silt unit and in the deeper sand and gravel unit were at background concentrations. Nitrate is added to the site constituents of concern based on the results of the supplemental investigations.

The August 2016 groundwater sample collected in the sand and gravel unit was below reporting limits for all constituents of concern except nitrate. Nitrate was detected at 35 mg/L, which is similar to other upgradient groundwater samples and within an expected range for regional background. The groundwater sample provides an upgradient bound on the extent of groundwater impacts.

The August 2016 test pitting did not find evidence of pesticide containers. Buried metallic debris was identified at each of the locations. The buried debris appeared to be household items that had been partially burned and buried. The two eastern test pits exposed foundation footings from historic structures.

In addition, a round of monitoring well sampling is scheduled for the week of April 14, 2025. This and future monitoring will specify that laboratories achieve reporting limits at or below screening levels, however analytical methods and sample matrix interferences may not allow on a caseby-case basis and these elevated reporting limits will be discussed. Upon receipt of the analytical data, a data quality review will be performed, and the data will be reported to Ecology with tables and maps.

2.2 Constituents of Concern

The RI and supplemental data collection confirmed the presence of impacts to soil and groundwater. Constituents of concern (COCs) at the site are constituents that exceeded the screening levels in soil or groundwater, and include:

- Organochlorine Pesticides
- Organophosphorous Pesticides
- Chlorinated Herbicides
- Nitrate

Table 1 summarizes soil and groundwater exceedances for individual constituents. Tables 2 and 3 summarize soil and groundwater results and screening levels. Screening levels in the RI that were below the practical quantitation limit (PQL) have been revised to the PQL (PGG, 2014)(provided in Appendix B of this document). This adjustment to PQLs is consistent with Washington Administrative Code (WAC) 173-340-720(7)(c) and does not alter the estimated extent of contamination. Constituent-specific maximum exceedance ratios and average values in Table 1 include non-detect values at half the reporting limit.

2.3 Extent of Contamination

The extents of contamination in soil and groundwater were investigated in the Remedial Investigation and updated following the December 2015 supplemental investigation (PGG, 2014; 2015). Figure 3 shows the revised extent of contamination in soil and groundwater. Key features of the extent of contamination include:

- Shallow soil (less than 5 feet) contamination is concentrated in former use areas, as inferred from historic air photos (PGG, 2014). Pesticide impacts below 5 feet primarily occur at the location of the former pesticide spray shed. An additional, smaller area is also present in the southwest corner of the site.
- Pesticide groundwater impacts near the water table appear to be similar in extent to the soil impacts. In the deeper sand and gravel unit, limited impacts above the screening levels were observed at location SP-32, and all pesticides were below screening levels at SMW-4 except nitrate and dinoseb, which is at the south (downgradient) property boundary. Nitrate measured at SMW-4 is significantly lower than other monitoring wells and is likely associated with agricultural sources outside the Site. Dinoseb observed in SMW-4 warrants additional monitoring to assess trends and possibly the installation of a new groundwater monitoring well if trends show increasing concentrations. The proposed 2025 sampling event will provide additional information regarding dinoseb and other contaminant concentrations.
- Based on groundwater and soil sampling events from 2015 to 2018, there was no clear trend
 of degradation within that short timeframe. Conditions are such that there should be
 degradation occurring for a number of Site contaminants; the proposed 2025 sampling will
 provide additional information. Overall, pesticide impacts do not appear to extend beyond the
 southern property boundary at the water table or in the deeper sand and gravel unit. The
 nitrate extent of contamination is mapped (Figure 3) as concentrations above background
 (15 mg/L). The extent of exceedance near the water table is similar to the pesticide extent
 but extends further to the west. Groundwater nitrate concentrations do not appear to exceed
 background at the southern property boundary.

2.4 Fate and Transport

The fate and transport of contaminants is discussed in the RI (PGG, 2014) and is summarized and updated here where relevant to the evaluation of remedial alternatives. There is substantial variability in sorption, solubility, and biodegradation rates among constituents detected at the Site. Partitioning coefficients (K_{oc}) provided in the Remedial Investigation imply retardation factors (R) span three orders of magnitude.

The fate and transport of pesticides and herbicides are chemical-specific and based on the chemical properties of each pesticide or herbicide. These fate and transport characteristics are a hybrid of the soil and chemical properties. The shallow silt unit is part of the glacial outburst flood slackwater deposits (Touchet Beds). These soil units are well characterized for both research and agricultural purposes and literature values are sufficient for the requested information (i.e. Chan, 2003).

Table 4 is a table of partitioning coefficients from the Cleanup Levels and Risk Calculation (CLARC) database. To provide further information, in the event of the installation of a new groundwater monitoring well, soil samples will be collected from the boring to analyze for characteristics such as soil surface area, cation exchange capacity, bulk density, porosity, and soil organic matter to further refine chemical fate and transport properties.

The measurement of Site-specific soil properties is informative, however empirical (monitoring) evidence of degradation is the most compelling data to indicate degradation and describe the fate and transport for this site. The planned April 2025 groundwater sampling will provide additional information regarding trends in contaminant degradation.

2.5 Applicable or Relevant and Appropriate Requirements

Applicable or relevant and appropriate requirements (ARARs) are state and federal regulations that apply to the site and may influence selection and implementation of remedial actions. The MTCA (Chapter 70.105D Revised Code of Washington [RCW]) requires that cleanup actions comply with applicable state and federal laws (WAC 173-340-360(2)a(iii)), which include legally applicable requirements, as well as requirements that the department determines are relevant and appropriate. ARARs for cleanup actions often include various construction-related permits, air emission requirements, offsite disposal requirements, and other issues related to impacts in and around the site. Specific regulations applicable to the site include:

- Model Toxics Control Act (MTCA)(WAC 173-340), which authorizes Ecology to adopt cleanup standards for groundwater and soil where hazardous substances are present
- Washington Hazardous Waste Management Act (Chapter 70.105 RCW; Chapter 173 303 WAC)
- General Occupational Health Standards (Chapter 296-62 WAC)
- Safety Standards for Construction Work (Chapter 296-155 WAC)
- Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC)
- Underground Injection Control Program (Chapter 173-218 WAC)
- The State Environmental Policy Act (SEPA) (RCW 43.21C; WAC 197-11)
- Toxic Substances Control Act (15 United States Code [USC] §2601 et seq. 40 CFR 761.61)
- The federal Clean Water Act (33 USC Section 1251)
- Federal Aviation Administration (FAA) Airport Compliance Program (FAA Order 5190.6A)
- Construction and/or site use permits from City of Sunnyside and Yakima County

2.5.1 Terrestrial Ecological Evaluation

Terrestrial ecological evaluations (TEE) are conducted to determine if contamination at a site presents risk to plants or animals that may inhabit or occupy the site. A TEE was conducted as part of the RI Work Plan (PGG, 2013) and is revisited here based on data collected during the RI and Ecology comments on the draft Feasibility Study (Ecology, 2017). The Site does not qualify for an exclusion under the simplified TEE evaluation due to the acreage of the adjacent agricultural parcel, which is classified as undeveloped land. However, no additional TEE is required under WAC 173-340-7491(1)(b) because the anticipated remedial action prevents contact with contamination. The relevant portions of MTCA are:

(1) Criteria for determining that no further evaluation is required. No further evaluation is required if the department determines that a site meets any of the criteria in (a) through (d) of this subsection:

And:

(1)(b) All soil contaminated with hazardous substances is, or will be, covered by buildings, paved roads, pavement, or other physical barriers that will prevent plants or wildlife from being exposed to the soil contamination. To qualify for this exclusion, an institutional control shall be required by the department under WAC 173-340-440. An exclusion based on planned future

land use shall include a completion date for such future development that is acceptable to the department;

As discussed in Section 6, the anticipated remedial alternative includes a physical barrier and institutional controls that will prevent plants or wildlife from coming into contact with contaminated soil.

2.5.2 Environmental Justice

When identifying cleanup actions for this alternative, the threats posted by the site to human health and the environment, including likely vulnerable populations and overburdened communities was taken into account per WAC 173-340-351 and WAC 173-340-360.

3 Screening of Remedial Alternatives

This section describes the remedial action objectives and applicable remedial technologies. Remedial alternatives are described and ranked for feasibility in Sections 4 and 5.

The remedial action objectives (RAOs) identified for the site are:

- RAO-1: Prevent or limit risks from direct human contact with impacted soil or groundwater
- RAO-2: Prevent offsite migration of contaminants
- RAO-3: Protect environmental receptors, which are primarily burrowing animals and bioaccumulation in predators that would consume them

These RAOs can be achieved through a combination of remedial technologies, monitoring, and institutional controls.

3.1 Applicability of Remedial Technologies

This section describes the general function and applicability of remedial technologies at the site. The remedial alternatives in Section 4 include combinations of these remedial technologies to achieve remedial action objectives.

3.1.1 Excavation

Excavation is a commonly-implemented method for remediation of impacted soil. Impacted soil is excavated and disposed of at an appropriate offsite disposal facility. The excavation is then backfilled with clean fill material. The disposal facility is selected based on the concentrations present in the impacted soil, transport logistics, and cost. Hazardous waste classification would occur if soil samples tested using the U.S Environmental Protection Agency (US EPA) Toxicity Characteristic Leaching Procedure (TCLP) exceed criteria defined in CFR 40 §261.21 Table 1, or criteria defined by waste disposal sites.

Offsite disposal of soil classified as hazardous waste would require disposal at a hazardous waste facility (e.g. Subtitle C landfill), which would incur additional expense relative to disposal at an approved Subtitle D landfill. The closest Subtitle D landfill that accepts pesticide contaminated soil is the Roosevelt Regional Landfill in Klickitat County. The closest Subtitle C landfill is located in Arlington, Oregon. Yakima County does not accept pesticide contaminated soils at local landfills.

Roosevelt Regional Landfill, located approximately 60 miles from the site, accepts pesticide contaminated soil below set criteria based on TCLP and dry soil concentrations. Approximately 10% of soil samples from the site exceed the dry soil criteria for toxaphene (10 mg/kg) and would not be accepted at the Roosevelt Regional Landfill. Additional soil volume may be classified as hazardous waste based on TCLP results and would also not be accepted at Roosevelt. The Waste Management facility in Arlington, Oregon includes both Subtitle D and Subtitle C landfills and can accept soil that is classified as hazardous waste. Neither the Waste Management nor the Roosevelt facilities accept soils with free liquid present (i.e., no saturated soils).

TCLP analyses have not been conducted at the site but would be conducted as part of the Cleanup Action Plan (CAP) to support excavation and disposal remedial design. Partitioning

calculations based on maximum observed soil concentrations suggest that a portion of the soil would require disposal at a Subtitle C facility.

Excavation is most applicable above the water table. Excavation below the water table is unlikely to be feasible due to dewatering requirements prior to loading and offsite transport.

3.1.2 Institutional Controls

Institutional controls are applicable to both soil and groundwater. Institutional controls for soil would include deed restrictions restricting excavation at the site to prevent direct-contact and/or ingestion of impacted soils. Institutional controls would be coupled with other remedial options to prevent contact with impacted soils near the ground surface that could be exposed through incidental site use. Institutional controls for groundwater would prohibit the installation of groundwater wells within the site (parcel #23129-23404) and neighboring parcel to the south (parcel #231029-24002) other than those installed for monitoring purposes. Institutional controls would likely specify a surveyed area within the property rather than encumber the much larger entire airport property. Institutional controls for groundwater will also include a depth limitation and apply only to the near-surface aquifer (to 76 feet below ground surface [bgs]) and the next deeper aquifer (to 106 feet bgs) because deeper aquifers below the first two regional confining layers are unlikely to be affected. MTCA requires that tenants be informed of the institutional controls and that control elements be incorporated into applicable lease or rental agreements.

Institutional controls are likely to be a component of the selected remedy at this site due to the inferred presence of impacted soil beneath onsite structures.

3.1.3 Capping

Capping is the installation and maintenance of a physical barrier between contaminated soil and the surface. This barrier prevents direct contact and can also be designed to reduce leaching of contamination from vadose zone soils. Capping will also control dust at the site, which could otherwise migrate offsite.

Capping design elements applicable at this site include: placement of a layer of clean fill; geotextile barriers to reduce infiltration and as a visual indicator of the contact with impacted soils; and asphalt or concrete paving as a physical barrier to prevent contact and reduce infiltration. The use of paved surfaces for containment typically includes a maintenance and inspection program to ensure continued function as a physical barrier.

3.1.4 Nanoscale Zero-Valent Iron

Nanoscale zero-valent iron (nZVI) is used to catalyze in-situ chemical degradation. nZVI has demonstrated ability to degrade nitrate, pesticides, and herbicides. nZVI is mixed with aquifer materials or emplaced as a permeable reactive barrier. The nZVI reduces contaminant concentrations by inducing reductive dechlorination (Cook, 2009; Thompson and Bezbaruah, 2008). Bench-scale studies of nZVI effectiveness indicate substantial variability in effectiveness ranging from rapid degradation to little or no degradation depending on the target pesticide compound. nZVI is unlikely to be effective for all COCs at the site. Effectiveness is also controlled by ability to bring contaminants into contact with nZVI particles, which would be challenging in the study area due to the silty aquifer materials and low groundwater flow velocities. Implementation of nZVI should be coupled with bench-scale testing to assess actual contaminant reduction ability.

nZVI is available in several commercial formulations, some of which are coupled with carrier solutions that enhance biodegradation (Section 3.1.7).

3.1.5 In-Situ Chemical Oxidation

In situ-chemical oxidation (ISCO) has variable effectiveness in reducing pesticide concentrations depending on the selected oxidant, application method, and specific pesticide being oxidized. ISCO will not be effective in reducing nitrate concentrations. ISCO typically requires multiple applications to achieve target concentration reductions. Of the available oxidizers, ozone, potassium/sodium permanganate and sodium persulfate¹ have a strong enough oxidizing potential to reduce pesticide concentrations, with ozone being the strongest oxidizer of the three. The low permeability of the site favors slower-reacting oxidants to allow time to bring the oxidant into contact with contaminated soil and groundwater.

- Ozone is applied by sparging gas through injection wells and is active in the subsurface for minutes to hours. Ozone is not a feasible option at this site due to the low permeability of the site and rapid reaction rate.
- Potassium or sodium permanganate is applied as liquid to injection wells or infiltration galleries. The solutions have a density similar to sea water and will typically sink rather than move horizontally with groundwater flow. Given the vertical gradients at the site, the density of the permanganate is a benefit because it would encourage vertical transport into/through the contaminated zone.
- Persulfate is applied as a liquid with or without a catalyst, which is typically either an iron filing, or an alkaline solution to raise pH to the 8-12 range. Persulfate could be useful for injection in areas with buried metal containers. However, because the conditions in the areas with buried metal containers are unknown, the reactions may or may not be adequately controlled and excess heat and reaction gasses (CO2 and water vapor) may be generated. Excess gas production could cause health and safety issues during injection. Persulfox is a proprietary compound that utilizes persulfate chemistry.
- RegenOx is a commonly used oxidant and, in principle, should be able to degrade pesticide and herbicide compounds in groundwater. However, because RegenOx has not been thoroughly studied for effectiveness with a broad range of pesticides, and the possibility that degradation could produce recalcitrant (persistent) compounds, the current Regenesis policy is that RegenOx is not recommended at pesticide sites. Therefore, while it is likely to be effective at degrading some site contaminants, the overall effectiveness is not well understood at present.

With proper design, ISCO has the potential to reduce pesticide and herbicide concentrations in soil and groundwater. However, due to the low permeability of the sandy silts at the site, bringing oxidants into full contact with contaminants is likely to be challenging and it is unlikely that cleanup levels could be achieved through the full soil and groundwater volume through ISCO alone. A realistic expectation for chemical oxidation is a reduction in most, but not all, constituents and that some constituents would remain above cleanup levels within the treatment zone. The technology is most likely to be useful when used as an intermediate step to reduce pesticide and herbicide concentrations followed by institutional controls and long-term monitoring.

An additional concern is that the toxicity of reaction byproducts is not well understood. The toxicity and specific chemical pathways are still being researched (Chiron, 2000). Subsequent toxicological research may demonstrate risk associated with the toxicology or fate and transport behavior of the reaction products. These technical concerns reduce confidence in the technical and regulatory implementability of an ISCO remedy at the site. Bench testing prior to design would improve understanding of the effectiveness of reductions in pesticide and herbicide

¹ Hydrogen peroxide is not listed because of health and safety concerns.

concentrations but would not address concerns related to reaction byproducts. Based on the technical difficultly of implementing ISCO at the site and potential for adverse secondary chemical effects, ISCO is not a preferred technology for the site and is not included in remedial alternatives.

3.1.6 Natural Attenuation

Natural attenuation (NA) includes a range of processes that reduce contaminant concentrations in the subsurface including advection, dispersion, and chemical and biologic degradation processes. The presence of 1,4-DDE indicates that DDT is degrading, suggesting that biodegradation of at least some COCs is occurring at the site. Typical literature degradation half-lives² for DDT and toxaphene in soil and groundwater of 10 to 15 years in soil under aerobic conditions and significantly faster under anaerobic conditions with half-lives on the order of 1 to 2 months are reported in the literature (EPA, 2005; FAO, 2000). A parcel of soil impacted with contaminants with an exceedance ratio of 10 and a 10-year half-life would take 30 to 40 years to reach cleanup levels; a 15-year half-life would extend that to 45 to 60 years. Assuming similar decay rates, the final cleanup time will be limited by the time required for the highest exceedance ratio to reach cleanup levels. Detected exceedance ratios at the site are as high as 275 in groundwater and 462 in soil (RI Table 3; PGG, 2014). Assuming a 10-year degradation half-life yields an estimated natural attenuation time of 80 to 90 years. In practice, degradation rate is likely to vary between constituents with some constituents decreasing to cleanup levels over shorter time periods.

NA processes in conjunction with the low mobility of the constituents appear to be currently protective of groundwater receptors downgradient of the airport property but alone are unlikely to achieve cleanup levels in hotspot areas in less than 50 to 100 years. NA is likely to be necessary after completion of any more aggressive action, because the aggressive actions are unlikely to result in complete removal or destruction of contamination sources, particularly in the silty sand unit. Although formal NA is not listed as an element of the alternatives, NA processes should be considered a part of each during compliance monitoring.

3.1.7 Enhanced Biodegradation

This technology reduces pesticide and herbicide concentrations by enhancing naturally occurring metabolic pathways. Naturally occurring bacteria in the subsurface metabolize and degrade pesticides and herbicides. These metabolic degradation pathways vary by specific compound, but are often rate-limited by electron-donor compounds required to complete the reactions. These reactions are enhanced by adding electron donor compounds to the subsurface to "feed" the naturally occurring bacterial populations and accelerate degradation of the target compounds. Examples of electron donor compounds include vegetable oil, molasses, and proprietary compounds such as Daramend and 3-D Microemulsion. Some compounds function best under specific oxidizing or reducing conditions. For example, optimal application of Daramend includes cycling between oxygen-rich and oxygen-poor reaction cycles through tilling or mixing of the soil. Compounds that function best under reducing conditions typically only require application and monitoring to check progress. Given the technical difficulty of aerating the saturated zone at this site, compounds that require intensive soil mixing are not recommended.

² Degradation half-lives are the time required for degradation mechanisms to reduce constituent concentrations by 50%. Microbes biodegrading contaminants are often empirically observed to follow a first-order (half-life) decay trend.

3.1.8 Soil Mixing and Amendment

This technology uses rotary mixing bits to amend soils above and below the water table with remediation compounds. All soils are left in place. Soil mixing amendments can be selected to either stabilize and immobilize compounds through mixing of bentonite, or cement into the subsurface, or distribute reactive compounds that will degrade or immobilize contaminants in place.

At the Sunnyside site, targeted excavations to remove or confirm the absence of buried metal debris would be required prior to implementation; larger pieces of metal could interfere with mixing operations. Specialty auger equipment would be required to reach the vertical extent of contamination at the site. Implementation would require either working around or removing existing structures and paved surfaces.

Soil mixing would nominally be conducted to 20 to 35 feet below ground surface at this site to reach the lower extent of groundwater impacts within the silt unit. Stabilization implementation would include adding a bentonite or bentonite grout amendment to reduce the hydraulic conductivity of the soil mass. Chemical treatment implementation would focus on amendment with nZVI and/or anaerobic biodegradation enhancers. Some sites implementing chemical degradation require multiple rounds of soil mixing to be effective. The primary benefit of immobilization is prevention of offsite migration along the groundwater pathway. However, because the site is currently protective, the technology offers little risk reduction. Soil mixing is significantly less cost effective than injection for application of chemical agents on a per-yard basis. Because homogeneous mixing is not a critical design requirement for the considered chemical alternatives, injection is preferred over soil mixing in development of remedial alternatives.

3.1.9 Groundwater Pump and Treat

Pump and treat systems extract groundwater from a network of wells, process the water to reduce contaminant concentrations to below cleanup levels and then either reinject the water to the aquifer or otherwise dispose of the groundwater. These systems can be designed to provide hydraulic control of groundwater to prevent offsite migration of contaminants. System effectiveness is a function of contaminant solubility and partitioning coefficients, and the ability to effectively flush groundwater through the target aquifer volume.

Water treatment would likely include either granular activated carbon filtration, or degradation in a reaction vessel by chemical oxidation to address pesticide and herbicide contamination. Nitrate could then be addressed through ion exchange or another commercial water treatment technology.

Pump and treat is not recommended for application at this site. The low permeability of the sandy silt aquifer would significantly limit extraction, and there are limited water disposal options; there is no sewer in the area. The high sorption coefficients of the pesticides and herbicides would likely result in extended treatment times. The primary application would be as a contingency measure to achieve hydraulic control of offsite migration, which has not occurred.

4 Remedial Alternatives

This section describes five remedial alternatives for the site incorporating selected remedial technologies described in Section 3.1. The alternatives are:

- Alternative 1: Excavation with Groundwater Treatment
- Alternative 2: Targeted Excavation with Groundwater Treatment
- Alternative 3: Containment with Groundwater Monitoring
- Alternative 4: Containment with Groundwater nZVI Treatment
- Alternative 5: Targeted Excavation with Containment

Alternative implementation including a brief description of the logistics, fulfillment of RAOs, alternative-specific data gaps, schedule, and estimated cost are discussed below and summarized in Table 5. Planning-level cost estimate details are included in Appendix A. Alternative schematic layouts are included in Figures 4 through 8. A disproportionate cost analysis is included in Table 6 and Section 6.

4.1 **Common Assumptions**

This section describes considerations and assumptions that are common to multiple remedial alternatives.

4.1.1 Excavation

All of the alternatives include excavation either as a primary contaminant mass removal technology or to facilitate construction of an asphalt cap. The primary intent of these actions is to reduce the direct contact and ingestion pathways from contaminated soil early in the remediation process and significantly improve the overall site protectiveness.

Excavation may require location, and possibly temporary removal and replacement of buried infrastructure including existing monitoring wells, power supply to existing buildings, and an east-west oriented City water supply line located near the north edge of the gravel access road. This may result in local service interruptions. A survey benchmark adjacent to SMW-1 will also have to be maintained or replaced at the conclusion of excavation.

Approximately 25% of excavated soils are expected to classify as hazardous waste, requiring special disposal. Soils with concentrations below hazardous waste criteria would be disposed of off-site at a Subtitle D landfill. Soils above hazardous waste criteria would be disposed of at the Columbia Ridge Subtitle C landfill in Arlington, Oregon. Soils would be transported to the landfills in trucks with covers to provide dust control. Hazardous waste designation is based on toxicity characteristic leaching protocol (TCLP) testing results and comparison to state criteria listed in WAC 173-303-090.

Excavation is likely to encounter metallic debris in areas with geophysical anomalies as identified in the RI and subsequent test pit explorations (Figure 3, and PGG, 2014). This material may include empty pesticide containers, building fragments, or other metal debris. If pesticide containers are encountered, they would either be stockpiled separately for separate disposal or included with excavated soils after communication with the disposal facility.

4.1.2 Groundwater Monitoring

All remedial alternatives assume a 60- or 90-year groundwater monitoring period that would be terminated when monitoring data indicate achievement of cleanup levels³. Groundwater monitoring would follow a schedule including:

- Quarterly: 1 year
- Semi-Annual: 3 years
- Annual: 2 years
- Biennial: to 1 year from completion of monitoring
- Quarterly compliance monitoring in final year

Groundwater monitoring would conclude when 4 consecutive monitoring events are below applicable cleanup levels, and it is assumed that the final year of monitoring will be conducted on a quarterly basis. It is expected that some constituents may be recalcitrant requiring longer monitoring times even for the more aggressive remedies. 60 years of monitoring is assumed for costing of Alternatives 1, 2 and 4. For Alternative 3 and 5, monitoring is costed assuming 90 years. While it is possible that groundwater objectives will be achieved in a shorter period of time, the longer timeframe is adopted to remain conservative for costing purposes given the uncertainty in degradation times for inaccessible contaminant mass. A conditional point of compliance for groundwater may be established in the Cleanup Action Plan as a part of the compliance monitoring program.

Groundwater cost estimates are calculated using the US EPA net present value (NPV) approach (EPA, 2000). The NPV calculation estimates how much money would need to be set aside in current day dollars to pay for a future cost. This allows estimation of the cost of a long-term, recurring expense in current dollars for more realistic comparison of alternatives with different cleanup times and cost distributions. The NPV calculation assumes that the money has a rate of return at a discount rate published by the Federal Office of Management and Budget. NPV calculations assume a 2.5% discount rate. NPV calculation discounts liabilities far in the future because less money needs to be set aside for an event far in the future than one in the near future.

4.1.3 Institutional Controls

Institutional controls are a component of all remedial alternatives. These institutional controls will include restrictions on groundwater use, construction or excavation activity, and notification requirements for the site. Institutional controls would be attached to the site title documents and filed with the County and City, as appropriate. Because of the large size of the airport property relative to the site, the institutional controls would be established for the entire airport parcel (#23129-23404) and for the adjoining parcel to the south (#231029-24002). Site restrictions include:

• Groundwater within shallow and deep aquifers above the first and second confining layers would be restricted to installation of monitoring wells only. The first confining layer is at approximately 35 feet bgs and the second at approximately 75 feet bgs in the log for a nearby water supply well⁴.

³ See Section 5.2.1 for a comparison to the MTCA requirement for a reasonable timeframe.

⁴ See well tag ID AAR996 at:

https://appswr.ecology.wa.gov/WellConstruction/Map/WCLSWebMap/TextSearch.aspx

- Excavation and construction would require environmental review and may include oversight. The intent is to prevent construction workers from contacting impacted soil, and to manage and verify that excavated soil is properly handled and disposed of.
- Lease and other rental agreements would be amended to include the institutional controls and notify tenants of the site conditions.

Specifics of the institutional controls would be further developed after the CAP has been completed. Institutional controls would likely be implemented after the primary construction phase of the selected alternative has been completed.

4.2 Alternative 1: Excavation with Groundwater Treatment

This alternative consists of excavation and disposal of all accessible vadose zone soils exceeding screening levels coupled with in-situ groundwater pesticide mass reduction via enhanced biodegradation (Figure 4). Institutional controls would be implemented for inaccessible soils beneath existing structures or infrastructure.

Soil excavation would include removal of approximately 4,200 cubic yards of soil (6,300 tons), of which approximately 25% is expected to classify as hazardous waste. Soils with concentrations below hazardous waste criteria would be disposed of off-site at a Subtitle D landfill, likely either the Waste Management Columbia Ridge facility or Roosevelt Regional Landfill. Soils above hazardous waste criteria would be disposed of at the Subtitle C portion of the Columbia Ridge landfill in Arlington, Oregon. Soils would be transported to the landfills in lined trucks with covers to provide dust control. Existing pavement in aircraft areas would be replaced after conclusion of excavation and backfill activities.

Groundwater treatment would include 3 annual injections of 3-D Microemulsion, Daramend, or another equivalent enhanced biodegradation compound. Costing assumes application of 3-D Microemulsion by direct push (Appendix A). The initial treatment area is a 25,000 square foot area with injections between 9 and 24 feet bgs (to 15 feet below the water table). The depth and extent of subsequent injections are assumed to be the same for all three events but may be reduced or adjusted for area and/or depth based on groundwater monitoring results.

Long-term groundwater monitoring would monitor compliance with RAOs. Institutional controls would be put in place for soil and groundwater remaining above cleanup levels. Institutional controls would restrict the use of groundwater at the site, and would place restrictions on excavation, which could impact future construction, as discussed in Section 3.1.2.

4.2.1 Comparison to Remedial Action Objectives

This alternative would meet RAOs 1 and 2.

4.2.2 Estimated Cost and Schedule

Excavation and backfilling would take 2 months assuming 10-15 truckloads per day and 5-day work weeks. Groundwater enhanced bioremediation injections would be completed within 18 months of the conclusion of excavation with an additional 6-month waiting period prior to the beginning of groundwater monitoring. Groundwater concentration reduction to cleanup levels is estimated at 20 to 40 years assuming enhanced degradation rates two to four times as fast as literature biodegradation half-lives. Residual hot spots are likely to remain, and groundwater monitoring is therefore assumed to continue for 60 years.

The estimated cost for Alternative 1 is \$1,847,000. Cost details are included in Appendix A Table A1. This cost estimate does not include removal of existing structures and source material below those structures.

4.2.3 Alternative-Specific Data Gaps

Alternative-specific data gaps include waste characterization profiling for soil disposal and treatability study for groundwater enhanced biodegradation.

Soil profiling includes collection of representative soil samples for TCLP testing. The TCLP results will be compared to state hazardous and dangerous waste criteria to determine which soils are disposed at Subtitle D (solid waste) and Subtitle C (hazardous waste) landfills. Approximately 25% of the excavated soils (those from hotspot areas) are expected to test as hazardous waste requiring disposal at a Subtitle C landfill. Waste profiling is a required component of offsite disposal.

Enhanced biodegradation treatability testing compares the effectiveness of treatment compounds on impacted soils from the site. The tests are conducted by collecting a homogenized composite soil sample from impacted areas of the site, combining with candidate treatment compounds, 3-D Microemulsion and Daramend, and comparing the resulting changes in constituent concentrations for effectiveness. This data is used to select or disregard candidate biodegradation compounds.

4.3 Alternative 2: Targeted Excavation with Groundwater Treatment

This alternative includes excavation and disposal of soils that exceed screening levels, within 3 feet of ground surface, coupled with in-situ groundwater treatment (Figure 5). Excavation to 3 feet provides separation between the ground surface and impacted soils reducing the risk of direct contact and removing contaminant mass from the site to an engineered disposal facility. The total excavated volume is expected to be approximately 3,100 cubic yards of soil (4,600 tons), of which approximately 25% is assumed to classify as hazardous waste. Groundwater treatment by enhanced biodegradation would reduce groundwater cleanup times and reduce offsite migration risk.

Groundwater treatment would include 3 annual injections of 3-D Microemulsion, Daramend, or another equivalent enhanced biodegradation compound. Costing assumes application of 3-D Microemulsion. The initial treatment area is a 25,000 square foot area with injections between 9 and 24 feet bgs (to 15 feet below the water table). The depth and extent of subsequent injections are assumed to be the same for all three events but may be reduced or adjusted for area and/or depth based on groundwater monitoring results. The institutional controls impact future redevelopment and new construction at the site. Any construction within that area would have to either not extend below 3 ft bgs or address contaminated soils encountered below that depth during construction and would include review for compatibility with ongoing remediation. Injections conducted after installation of the containment layer would include a specification for asphalt repair and borehole sealing across the geotextile barrier.

Long-term groundwater monitoring would monitor compliance with RAOs. Institutional controls would be put in place for soil and groundwater remaining above cleanup levels. Institutional controls would restrict the use of groundwater at the site, and would place restrictions on excavation, which could impact future construction.

4.3.1 Comparison to Remedial Action Objectives

This alternative would meet RAOs 1, 2, and 3.

4.3.2 Estimated Cost and Schedule

Direct push groundwater injections would take approximately 1 month to complete and would precede excavation. Subsequent annual injection events would be conducted after excavation and paving. Excavation and backfilling is expected to take approximately 2 months. Groundwater monitoring is assumed to continue for approximately 60 years, similar to the remediation time assumptions for Alternative 1.

The estimated cost for Alternative 2 is \$1,337,000. Details are included in Appendix A Table A2.

4.3.3 Alternative-Specific Data Gaps

Alternative-specific data gaps include waste characterization profiling for soil disposal and treatability study for groundwater enhanced biodegradation, similar to Alternative 1.

4.4 Alternative 3: Containment with Groundwater Monitoring

This alternative uses a containment remedy to prevent direct contact with contaminated soils and reduce infiltration. Long-term groundwater monitoring is used to confirm site groundwater protectiveness (Figure 6). Groundwater sampling in both the silt unit and sand and gravel unit indicate that current groundwater concentrations are below screening levels for pesticides and herbicides and at or below background concentrations for nitrate at the property boundary (PGG, 2016).

The containment remedy would consist of an asphalt slab over the impacted soil area and repair of damaged pavement within the existing paved aircraft tarmac. The asphalt would provide a physical barrier preventing contact with impacted soils and would require concurrent institutional controls to address potential future site redevelopment/construction or other excavation work. The asphalt cap would also provide a low permeability barrier to reduce infiltration and leaching of contaminants in the vadose zone. Installation of the asphalt cap would include excavation of 1 foot of soil to provide room to install 1 foot of base fill material to support the asphalt layer. Contaminated soil would be disposed of at an appropriate facility following the same screening as described for Alternative 1. For costing purposes, 25% of the excavated soil is assumed to require Subtitle C disposal.

Long-term groundwater monitoring would monitor compliance with RAOs. Institutional controls would be put in place for soil and groundwater remaining above cleanup levels. Institutional controls would restrict the use of groundwater at the site, and would place restrictions on excavation, which could impact future construction.

An operation and maintenance plan (OMP) would be implemented for inspection and maintenance of the containment layer. OMPs for this type of containment typically include annual inspection of the paved surface for cracks greater than 1/8-inch or other obvious damage, and for vegetation growing in the containment surface with repair within 60 or 90 days of observation. Sites using engineered containment systems may also be required to demonstrate financial assurance for maintenance of engineered control elements. Site tenants would also be required to be notified of site restrictions associated with the remedy and have the remedy incorporated into lease agreements (Ecology, 2007).

4.4.1 Comparison to Remedial Action Objectives

This alternative would meet RAOs 1, 2 and 3. The asphalt cap would prevent direct contact with impacted soils and prevent offsite transport of soils. Offsite migration of impacted groundwater would be addressed through groundwater monitoring.

4.4.2 Estimated Cost and Schedule

Paving and pavement repair would take approximately 1 month to implement assuming 2 weeks for excavation, and 2 weeks for backfill and pavement installation/repair work. Groundwater monitoring is assumed to occur for 90 years.

The estimated cost for Alternative 3 is \$674,000. Details are included in Appendix A Table A3.

4.4.3 Alternative-Specific Data Gaps

Profiling of excavated materials as described in Alternative 1 would be required.

4.5 Alternative 4: Containment with Groundwater nZVI Treatment

This alternative uses a containment remedy to prevent direct contact with contaminated soils and reduce infiltration, coupled with injection of nZVI to prevent offsite migration of contaminants in groundwater (Figure 7).

The containment remedy would consist of an asphalt slab over the impacted soil area and repair of damaged pavement within the existing paved aircraft tarmac. The asphalt would provide a physical barrier preventing contact with impacted soils and would require concurrent institutional controls to address potential future site redevelopment/construction or other excavation work. The asphalt cap would also provide a low impermeability barrier to reduce infiltration and leaching of contaminants in the vadose zone. Installation of the asphalt cap would include excavation of 1 foot of soil to provide room to install 1 foot of base fill material to support the asphalt layer. Contaminated soil would be disposed of at an appropriate facility following the same screening as described for Alternative 1. For costing purposes, 25% of the excavated soil is assumed to require Subtitle C disposal.

Groundwater treatment would include injection of nZVI along the downgradient edge of the site and immediately downgradient of soil hotspots at the former spray shed and reported buried debris. The injections would form a permeable reactive barrier zone intended to reduce concentrations of pesticides, herbicides and nitrate in groundwater. The nZVI treatment barriers shown in Figure 7 include approximately 1,780 cubic yards of aquifer assuming a 10-foot thickness. nZVI would degrade mobile pesticides and herbicides and reduce nitrate concentrations through denitrification. The objective would not be to reduce overall site groundwater concentrations but to improve the groundwater pathway protectiveness of the containment remedy.

Long-term groundwater monitoring would monitor compliance with RAOs. Institutional controls would be put in place for soil and groundwater remaining above cleanup levels. Institutional controls would restrict the use of groundwater at the site, and would place restrictions on excavation, which could impact future construction.

4.5.1 Comparison to Remedial Action Objectives

This alternative would meet RAOs 1, 2, and 3. The asphalt cap would prevent direct contact with impacted soils and prevent offsite transport of soils. Offsite migration of impacted groundwater would be addressed through groundwater treatment and monitoring.

4.5.2 Estimated Cost and Schedule

Groundwater treatment injections would occur in 1 mobilization taking approximately 3 weeks. Paving and pavement repair would take approximately 1 month and would occur after the first groundwater injections were complete. Groundwater monitoring is assumed to occur for 60 years.

The estimated cost for Alternative 4 is \$1,217,000. Details are included in Appendix A Table A4.

4.5.3 Alternative-Specific Data Gaps

Alternative-specific data gaps include treatability study bench testing for groundwater contaminant reduction. This information would be incorporated into the final remedial design.

4.6 Alternative 5: Targeted Excavation with Containment

This alternative consists of excavation and disposal of soil that exceeds screening levels within 3 feet of ground surface coupled with a containment remedy to prevent direct contact with contaminated soils and reduce infiltration (Figure 8). Excavation to 3 feet provides separation between the ground surface and impacted soils reducing the risk of direct contact and removing contaminant mass from the site to an engineered disposal facility. Groundwater sampling in both the silt unit and sand and gravel unit indicate that current groundwater concentrations are below screening levels for pesticides and herbicides and at or below background concentrations for nitrate at the property boundary (PGG, 2016).

Soil excavation would include removal of approximately 3,100 cubic yards of soil (4,600 tons), of which approximately 25% is expected to classify as hazardous waste. Soils with concentrations below hazardous waste criteria would be disposed of off-site at a Subtitle D landfill, likely either the Waste Management Columbia Ridge facility or Roosevelt Regional Landfill. Soils above hazardous waste criteria would be disposed of at the Subtitle C portion of the Columbia Ridge landfill in Arlington, Oregon. Soils would be transported to the landfills in lined trucks with covers to provide dust control. Existing pavement in aircraft areas would be replaced after conclusion of excavation and backfill activities.

The containment remedy would consist of an asphalt slab over the impacted soil area and repair of damaged pavement within the existing paved aircraft tarmac. The asphalt would provide a physical barrier preventing contact with impacted soils and would require concurrent institutional controls to address potential future site redevelopment/construction or other excavation work. The asphalt cap would also provide a low permeability barrier to reduce infiltration and leaching of contaminants in the vadose zone. Installation of the asphalt cap would include 1 foot of base fill material to support the asphalt layer. Contaminated soil would be disposed of at an appropriate facility following the same screening as described for Alternative 1. For costing purposes, 25% of the excavated soil is assumed to require Subtitle C disposal.

Long-term groundwater monitoring would monitor compliance with RAOs. Institutional controls would be put in place for soil and groundwater remaining above cleanup levels. Institutional

controls would restrict the use of groundwater at the site, and would place restrictions on excavation, which could impact future construction, as discussed in Section 3.1.2.

An operation and maintenance plan (OMP) would be implemented for inspection and maintenance of the containment layer. OMPs for this type of containment typically include annual inspection of the paved surface for cracks greater than 1/8-inch or other obvious damage, and for vegetation growing in the containment surface with repair within 60 or 90 days of observation. Sites using engineered containment systems may also be required to demonstrate financial assurance for maintenance of engineered control elements. Site tenants would also be required to be notified of site restrictions associated with the remedy and have the remedy incorporated into lease agreements (Ecology, 2007).

4.6.1 Comparison to Remedial Action Objectives

This alternative would meet RAOs 1, 2, and 3. The asphalt cap would prevent direct contact with impacted soils and prevent offsite transport of soils. Offsite migration of impacted groundwater would be addressed through groundwater monitoring.

4.6.2 Estimated Cost and Schedule

Excavation and backfilling would take 2 months assuming 10-15 truckloads per day and 5-day work weeks. Paving and pavement repair would take approximately 1 month and would occur after the excavation and backfilling is complete. Groundwater monitoring is assumed to occur for 90 years.

The estimated cost for Alternative 5 is \$1,324,000. Cost details are included in Appendix A Table A5. This cost estimate does not include removal of existing structures and source material below those structures.

4.6.3 Alternative-Specific Data Gaps

Profiling of excavated materials as described in Alternative 1 would be required.

4.7 Contingency

The CAP will include contingency actions to be implemented in the event that remediation objectives are not met. Contingency actions may include supplemental groundwater treatment to mitigate offsite migration, installation of filtration or other water treatment at downgradient wells, or modification/repair of the asphalt cap, as applicable.

5 Evaluation of Alternatives

MTCA requires that cleanup alternatives be compared to criteria to evaluate the adequacy of achieving the intent of the regulations and as a basis for comparing their relative merits. The evaluation of each cleanup alternative against the MTCA criteria specified in WAC 173-340-360 is presented in the following sections. Consistent with MTCA, the cleanup alternatives were evaluated with respect to threshold requirements (Section 5.1) and other MTCA Criteria (Section 5.2). All remedial alternatives discussed in Section 4 are viable alternatives under MTCA. Each alternative achieves the applicable RAOs and meets MTCA threshold requirements.

5.1 Threshold Requirements

Under MTCA, a cleanup alternative must meet the following threshold requirements (WAC 173-340-360(2)(a)):

- Protect human health and the environment
- Comply with cleanup standards
- Comply with applicable state and federal laws
- Provide for compliance monitoring

Compliance with the threshold requirements under MTCA is presumed to be protective of human health and the environment once the cleanup standards are met for all affected media. Also, any cleanup action performed in accordance with the requirements of MTCA is assumed to be in compliance with cleanup standards and applicable state and federal laws. The following sections identify how each cleanup alternative complies with the threshold requirements.

5.1.1 Protect Human Health and the Environment

The proposed alternatives protect human health and the environment through containment and institutional controls during the remedial action, contaminant reduction, and groundwater compliance monitoring.

5.1.2 Comply with Cleanup Standards

Alternatives 1 through 4 all comply with MTCA cleanup standards through the various cleanup technologies employed, and achievement of the applicable remedial action objectives. All of the proposed alternatives will leave some contamination in place at the standard points of compliance for soil and groundwater in areas that are inaccessible or technically impractical to achieve cleanup levels. These areas are addressed through the use of institutional controls and compliance groundwater monitoring.

5.1.3 Comply with State and Federal Laws

Alternatives comply with state and federal laws through compliance with identified ARARs and compliance with MTCA regulations (Section 2.4).

5.1.4 Provide for Compliance Monitoring

Compliance monitoring requirements (WAC 173-340-410(1)) include: protection monitoring during construction, operation, and maintenance of the cleanup action; performance monitoring

to confirm progress of the cleanup action; and confirmation monitoring to confirm the cleanup action has been attained and the long-term effectiveness of the cleanup action.

All of the alternatives include compliance monitoring.

5.2 Other MTCA Requirements

MTCA requires consideration of additional criteria for alternatives meeting the threshold requirements. The additional requirements include:

- Require that remediation be completed in a reasonable restoration timeframe
- Use permanent solutions to the extent practicable
- Consider public concerns

These additional MTCA criteria are discussed below.

5.2.1 Requirement for a Reasonable Restoration Timeframe

MTCA identifies a number of factors to be considered when establishing a reasonable restoration timeframe. A cleanup action is considered to have achieved restoration once cleanup standards have been met. The basis for considering if timeframes are reasonable is summarized in the bullets below:

- Potential risks to human health and the environment: The site currently presents a risk to human health and environment. The primary risk pathway is contact with impacted soils. There are no known impacted domestic wells. All remedial alternatives quickly reduce the potential for direct contact and prevent use of impacted groundwater through institutional controls during the remediation. Reduction of groundwater concentrations to below cleanup levels is variable between the alternatives, but generally slow because of the need to rely on NA processes to reduce concentration of inaccessible contaminant source mass.
- Availability of alternative water supplies: All onsite water is provided by a municipal supply owned and operated by the City of Sunnyside.
- Current use of the site, surrounding areas, and associated resources that are, or may be, affected by releases from the site: Current use of the site is not impacted by the presence of the contamination, but new construction and development would be limited by soil left in place. The City of Sunnyside is expected to own the airport property indefinitely and will be able to control site construction activities in the affected areas consistent with any applied institutional controls.
- Likely effectiveness and reliability of institutional controls: Institutional controls are likely to be effective at preventing direct contact with soil and consumption of groundwater.
- Practicability of achieving a shorter restoration timeframe: Some areas of contaminant mass are located under buildings and are inaccessible under existing conditions. Pesticides and herbicides in groundwater have significant variability in treatability and are relatively immobile due to both high sorption coefficients and silty lithologies near the water table. Even the more aggressive remedies are expected to leave contaminant mass in place and recalcitrant compounds may persist. NA and monitoring is conservatively estimated for 60 to 90 years at the site.
- Ability to control and monitor migration of hazardous substances from the site: Monitoring wells can provide adequate monitoring for potential offsite migration, though no such migration has been detected.

• *Toxicity of the hazardous substances at the site*: Soil and groundwater have pesticide concentrations with exceedance ratios up to 462 and 275 times their respective cleanup levels (PGG, 2014). The most likely receptor pathway is through direct contact or ingestion of near-surface soils. Soils within the upper 18 inches have exceedance ratios up to 130.

All of the considered remedial alternatives include excavation or containment elements to significantly reduce the direct contact pathway during the initial phase of the remediation. Once the excavation and/or containment elements have been completed, the contamination at the site will represent a relatively low risk because the groundwater pathway is not complete beyond the property boundary. Because of the technical difficulty of accessing and treating all of the contaminant mass, remediation times ranging from 60 to 90 years are expected for all of the considered alternatives. This is a conservative estimate for these timeframes, and actual time to restoration is likely to be significantly shorter. As discussed in the Draft Cleanup Action Plan (Mott MacDonald, 2025), April and May 2025 sampling analytical results indicate that concentrations have decreased since 2018 sampling. The decreasing trend may indicate a shorter restoration timeframe, to be confirmed in future remedial action and sampling.

Background nitrate concentrations exceed applicable MTCA cleanup levels. Therefore, reducing nitrate concentrations below background levels is not considered consistent with WAC 173-340-360(4)(d).

5.2.2 Permanent Solutions to the Maximum Extent Practicable

MTCA gives preference to permanent solutions to the extent possible. Permanent actions are those that do not require additional action over time to achieve remedial objectives.

The primary difference between the alternatives with respect to permanence is the requirement for containment layer maintenance and enforcement of institutional elements. The relative permanence of the remedial alternatives is evaluated in the disproportionate cost analysis (Section 6).

5.2.3 Requirement for Consideration of Public Concerns

Consideration of public concerns will be incorporated through the public review process. Formal public comments were not received on the RI report. Any additional comments will be considered and addressed as applicable in the final FFS or draft CAP.

6 Disproportionate Cost Analysis

The disproportionate cost analysis (DCA) ranks alternatives based on their relative costs and benefits. The evaluation criteria for the disproportionate cost analysis are specified in WAC 173-340-360(3)(f), and include the following:

- Overall protectiveness
- Permanence
- Long-term effectiveness
- Management of short-term risks
- Technical and administrative implementability
- Public concerns
- Cost (weighed against criteria above)

The following sections discuss the relative rankings of alternatives for each of the criteria. Each alternative is assigned a score from 1 to 10 with higher values reflecting fulfillment of the criteria. Values are assigned qualitatively based on professional judgement and the relative merits of each alternative. Scores for each criteria are summed to calculate the overall benefit score (Table 6).

6.1 Overall Protectiveness

The overall protectiveness criterion considers how much existing risks are reduced, the time required to reach cleanup standards, onsite and offsite risk and impacts associated with implementation, and overall improvement in environmental quality.

All of the alternatives leave inaccessible contaminant mass in place and have similar remedial action components designed to reduce general public direct contact risk. All of the considered alternatives are likely to require 60 years or more to achieve remedial action objectives due to the inaccessibility and technical difficulty of accessing all known contamination. Aggressive excavation and treatment Alternatives 1 and 2 reduce the risk of offsite migration and reduce contaminant mass at the site but have increased short-term risks and still leave contamination in place. Less aggressive excavation coupled with containment and/or groundwater treatment (Alternatives 4 and 5) may reduce the risk of offsite groundwater migration, but there are potential issues with the effectiveness of treating a broad spectrum of pesticides and herbicides and leaves the majority of vadose zone contaminant mass in place. Alternative 3 has the lowest short-term risk and is the most straightforward to implement but does not actively attempt to reduce groundwater concentrations resulting in long compliance monitoring times. Given the maturity of the contamination at the site, and the generally low solubility and mobility of the pesticides and herbicides is likely to remain protective of groundwater receptors at the property boundary.

Based on these factors, the alternatives are assigned the following scores (Table 6):

- Alternative 1:8
- Alternative 2: 8
- Alternative 3: 7
- Alternative 4: 8

• Alternative 5: 8

6.2 Permanence

Permanence criteria consider the degree to which the alternative permanently reduces the toxicity, mobility, or mass of hazardous substances. This includes consideration of the effectiveness of the alternative in destroying the hazardous substances, the reduction of source areas, and the potential for reversibility of the contaminant reductions.

The selected alternatives focus on either containment or offsite disposal, but all leave some source mass in place. Groundwater treatment is included as an additional measure to reduce the risk of offsite groundwater migration in Alternatives 1, 2 and 4. Containment elements require ongoing effort ranging from incorporation into lease agreements to inspection and repair of asphalt cover surfaces. Alternative 1 is the most permanent due to the removal of large quantities of source mass and lowest degree of ongoing effort.

Based on these factors, the alternatives are assigned the following scores (Table 6):

- Alternative 1:8
- Alternative 2: 7
- Alternative 3: 6
- Alternative 4: 7
- Alternative 5: 7

6.3 Long-Term Effectiveness

The long-term effectiveness criterium considers the certainty that the alternative will be successful, the reliability of the alternative until cleanup levels are met, the magnitude of residual risk at alternative completion, and the effectiveness of controls required to manage contamination left in place. MTCA regulations specify a preference for cleanup action components in descending order of reuse/recycling, destruction or detoxification, immobilization/solidification, offsite disposal in an engineered facility, onsite isolation or containment with attending engineering controls, and institutional controls and monitoring. This does not consider the time required to meet the objective.

All considered alternatives include offsite disposal and containment components with secondary emphasis of groundwater treatment to reduce the source mass and risk of offsite migration. None of the alternatives achieve complete source removal, and suspected high-concentration areas under the metal building will remain in place in all alternatives. All alternatives include compliance monitoring to track effectiveness. Therefore, alternative long-term effectiveness is limited by the ability to reduce source mass. Alternative 3 has the lowest long-term effectiveness because it is the least aggressive approach to reducing soil and groundwater concentrations but will still remain protective of the site receptors.

Based on these factors, the alternatives are assigned the following scores (Table 6):

- Alternative 1: 8
- Alternative 2: 8
- Alternative 3: 6
- Alternative 4: 8
- Alternative 5: 8

6.4 Management of Short-Term Risks

The management of short-term risks criterion considers the risk to human health and the environment during construction and implementation, and the effectiveness of the measures that will be taken to manage such risks.

Short-term risks vary between the alternatives. Excavation and hauling of the contaminated soil significantly increase the potential for human exposure through direct contact, inhalation, and ingestion due to dust generation, tracking and hauling. Therefore, the management of short-term risks are ranked based on their relative excavation quantities and placement of a protective cap to prevent direct contact.

Based on these factors, the alternatives are assigned the following scores (Table 6):

- Alternative 1: 5
- Alternative 2: 6
- Alternative 3: 8
- Alternative 4: 7
- Alternative 5: 6

6.5 Technical and Administrative Implementability

The implementability criterion considers the relative difficulty and uncertainty of implementing the cleanup actions. Factors considered in this evaluation include use of innovative vs. mature technologies, the feasibility of implementing the technologies in the site conditions, and potential regulatory or permitting issues.

All considered alternatives incorporate a mix of mature technologies and technologies with mixed results in pesticide sites. Excavation and containment are demonstrated, mature technologies. Chemical treatment of pesticides in soil and groundwater is uncertain given the mix of constituents at the site prior to bench testing. Alternative 3 is the simplest to implement and relies on simple, proven approaches. Excavation is a mature technology, but careful implementation to prevent disruption to airport activities, human contact with impacted soils, and potentially challenging excavation conditions in the capillary zone could increase the difficulty of excavation at the site. Alternative 3 has the lowest level of effort and simplest implementation, followed by Alternative 5, Alternative 4, Alternative 2, and Alternative 1.

Based on these factors, the alternatives are assigned the following scores (Table 6):

- Alternative 1: 7
- Alternative 2: 7
- Alternative 3: 8
- Alternative 4: 7
- Alternative 5: 7

6.6 Public Concerns

Specific comments from the public have not been received on site documents. Therefore, all alternatives have similar consideration of public concerns. The alternatives are assigned the following scores (Table 6):

Alternative 1: 9

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- Alternative 2: 9
- Alternative 3: 9
- Alternative 4: 9
- Alternative 5: 9

6.7 Cost

Cost is not included in the MTCA benefit score but is instead weighed against the benefit score in a cost to benefit ratio for each alternative. The estimated costs for implementation of the alternatives rounded to the nearest hundred thousand dollars are (Table 6):

- Alternative 1: \$1.8 million
- Alternative 2: \$1.3 million
- Alternative 3: \$0.7 million
- Alternative 4: \$1.2 million
- Alternative 5: \$1.3 million

Details supporting the cost estimate for each alternative are included in Appendix A and discussed in each alternative.

6.8 Ranking of Alternatives

Alternatives are ranked by their respective cost to benefit ratios (Table 6). Cost to benefit ratios are calculated as the costs divided by 10,000 and then divided by the benefit scores. Cost benefit ratios are also presented graphically in Figure 9. The cost to benefit ratios for the alternatives are:

- Alternative 1: 3.5
- Alternative 2: 3.0
- Alternative 3: 1.6
- Alternative 4: 2.6
- Alternative 5: 2.9

Alternative 3 is the preferred remedy based on the DCA ranking of alternatives.

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 Table 1. Constituents of Concern

 Sunnyside Municipal Airport, Sunnyside, Washington

		Soil	Number of	Number of	Number of Soil	Maximum Soil	Maximum
Constituent	Coll Unit	Screening	Soil	Soil			Exceedanc
Constituent	Soil Units	Level	Analyses	Detections	Exceedances ¹	Value ¹	Ratio
Chlorinated Herbicides		0.5	70	0	0	6 F	0.7
2,4,5-T	ug/kg	9.5				6.5	
2,4,5-TP (Silvex)	ug/kg	4979	70 70	1	0	13 31	0.0
2,4-D	ug/kg	9.4		6	5		3.3
2,4-DB	ug/kg	16179 959.2	70 70	1 0	0	140 155	0.0
Dalapon	ug/kg			-	-		•
Dicamba	ug/kg	3258	70	0	0	9	0.0
Dichlorprop	ug/kg	71	70	0	0	47	0.7
Dinoseb	ug/kg	687.6	70	11	1	9100	13
MCPA	ug/kg	940	70	0	2	1300	1.4
MCPP	ug/kg	940	70	1	1	1100	1.2
Pentachlorophenol	ug/kg	3.5	70	2	5	13	3.7
rganochlorine Pesticides							
4,4'-DDD	ug/kg	335.4	70	11	1	14000	42
4,4'-DDE	ug/kg	445.7	70	27	10	17000	38
4,4'-DDT	ug/kg	2941	72	29	8	150000	51
Aldrin	ug/kg	5	72	2	3	550	110
alpha-BHC	ug/kg	5	70	0	1	550	110
alpha-Chlordane	ug/kg	2857	70	2	0	1050	0.4
beta-BHC	ug/kg	5	70	0	1	550	110
delta-BHC	ug/kg	5	70	0	1	550	110
Dieldrin	ug/kg	10	72	14	13	4100	410
Endosulfan I	ug/kg	304683	70	9	0	5000	0.0
Endosulfan II	ug/kg	304683	70	13	õ	7400	0.0
Endosulfan Sulfate	ug/kg	480000	70	7	0	1050	0.0
Endrin	ug/kg	440.4	72	8	1	1050	2.4
Endrin Aldehyde	ug/kg	24000	70	10	0	5900	0.2
Endrin Ketone		24000 8560	70	8	0	1050	0.2
	ug/kg						
gamma-BHC	ug/kg	6.2	72	8	6	550	89
gamma-Chlordane	ug/kg	2857	70	4	0	1050	0.4
Heptachlor	ug/kg	5	72	2	3	550	110
Heptachlor Epoxide	ug/kg	8	70	7	6	550	69
Methoxychlor	ug/kg	64160	70	7	0	15000	0.2
Toxaphene	ug/kg	152.8	70	22	19	320000	2094
rganophosphorous Pesticides							
Azinphos-methyl	ug/kg	25	63	1	0	0.023	0.9
Bolstar (Sulprofos)	ug/kg	10300	63	0	0	0.0135	0.0
Chlorpyrifos	ug/kg	43900	63	0	0	0.0135	0.0
Coumaphos	ug/kg	65	63	0	0	0.0135	0.2
Demeton-S	ug/kg	25	63	0	0	0.0135	0.5
Diazinon	ug/kg	30	63	0	0	0.0135	0.5
Dichlorvos (DDVP)	ug/kg	3500	63	0	0	0.0135	0.0
Dimethoate	ug/kg	20	63	2	2	3.3	165
Disulfoton (Di-Syston)	ug/kg	95	63	2	1	0.11	1.2
EPN	ug/kg	24	63	1	1	0.025	1.0
Ethoprop	ug/kg	25	63	1	1	0.11	4.4
Fensulfothion	ug/kg	60	63	2	2	0.12	2.0
			63	2	-		
Fenthion	ug/kg	25			0	0.0135	0.5
Malathion	ug/kg	2520	63	0	0	0.0135	0.0
Merphos	ug/kg	2200	63	1	0	0.087	0.0
Methyl Parathion	ug/kg	447	63	0	0	0.0135	0.0
Monocrotophos	ug/kg	60	63	0	0	0.0335	0.6
Phorate	ug/kg	162	63	0	0	0.0135	0.1
Sulfotepp	ug/kg	1600	63	0	0	0.0135	0.0
Tetrachlorvinphos (Gardona)	ug/kg	41700	63	0	0	0.0135	0.0
Tokuthion	ug/kg	98200	63	0	0	0.0135	0.0
Trichloronate	ug/kg	169	63	0	0	0.0135	0.1
norganics	5.0						
Nitrate as N							
Petroleum Compounds							
Benzene							
Diesel Range Organics							
Ethylbenzene							
Lube Oil							
m,p-Xylene							
o-Xylene							
Toluene							

 Table 1. Constituents of Concern

 Sunnyside Municipal Airport, Sunnyside, Washington

	Groundwater	Groundwater Screening	Number of Groundwater	Number of Groundwater	Number of Groundwater	Maximum Groundwater	Maximum Exceedanc
Constituent	Units	Level	Analyses	Detections	Exceedances	Value 1	Ratio
Chlorinated Herbicides	Units	Level	Analyses	Detections	Exceedances	Value	Natio
2,4,5-T	ug/L	0.024	31	4	26	0.66	27.5
2.4-D	ug/L	70	31	6	0	2.5	0.0
2,4-DB	ug/L	128	31	4	0	2.3	0.0
Dalapon	ug/L	200	31	0	0	0.255	0.0
Dicamba	ug/L	480	31	13	0	9.4	0.0
Dichlorprop	ug/L	0.024	31	4	18	0.12	5.0
Dinoseb	ug/L ug/L	7	31	27	15	460	65.7
MCPA		8	31	5	5	220	27.5
MCPA	ug/L			5	5		
	ug/L	16	31			170	10.6
Pentachlorophenol	ug/L	0.219	31	2	0	0.041	0.2
Silvex	ug/L	50	31	8	0	0.24	0.0
rganochlorine Pesticides							
4,4'-DDD	ug/L	0.365	31	11	0	0.3	0.8
4,4'-DDE	ug/L	0.257	31	9	0	0.19	0.7
4,4'-DDT	ug/L	0.257	31	18	0	0.14	0.5
Aldrin	ug/L	0.005	31	8	8	0.08	16.0
alpha-BHC	ug/L	0.014	31	14	11	0.12	8.6
alpha-Chlordane	ug/L	0.25	31	13	0	0.14	0.6
beta-BHC	ug/L	0.049	31	0	0	0.00305	0.1
delta-BHC	ug/L	0.005	31	6	6	0.25	50.0
Dieldrin	ug/L	0.005	31	22	22	0.26	52.0
Endosulfan I	ug/L	96	31	13	0	1.6	0.0
Endosulfan II	ug/L	96	31	22	0	0.67	0.0
Endosulfan Sulfate	ug/L	96	31	8	0	0.21	0.0
Endrin	ug/L	2	31	8	0	0.087	0.0
		2	31	9	0		
Endrin Aldehyde	ug/L					0.24	0.1
Endrin Ketone	ug/L	2	31	9	0	0.17	0.1
gamma-BHC	ug/L	0.2	31	13	3	1.1	5.5
gamma-Chlordane	ug/L	0.25	31	3	0	0.085	0.3
Heptachlor	ug/L	0.019	31	6	2	0.19	10.0
Heptachlor Epoxide	ug/L	0.005	31	0	1	0.0235	4.7
Methoxychlor	ug/L	40	31	10	0	0.93	0.0
Toxaphene	ug/L	0.08	31	3	18	22	275.0
rganophosphorous Pesticides							
Azinphos-methyl	ug/L	0.5	31	0	0	0.345	0.7
Bolstar (Sulprofos)	ug/L	0.2	31	0	3	0.25	1.3
Chlorpyrifos	ug/L	48	31	0	0	0.25	0.0
Coumaphos	ug/L	0.2	31	0	3	0.25	1.3
Demeton-S	ug/L	0.64	31	1	1	1.4	2.2
Diazinon	ug/L	0.2	31	0	3	0.25	1.3
Dichlorvos (DDVP)	ug/L	0.2	31	0	3	0.25	1.3
Dimethoate	ug/L	3.2	31	1	0	1.4	0.4
Disulfoton (Di-Syston)	ug/L	0.64	31	4	3	3.56	5.6
EPN	ug/L	0.2	31	4	3	0.25	1.3
		0.2	31	0	3		1.3
Ethoprop	ug/L		31	0		0.25	
Fensulfothion	ug/L	0.5			0	0.345	0.7
Fenthion	ug/L	0.2	31	0	3	0.25	1.3
Malathion	ug/L	320	31	3	0	55	0.2
Merphos	ug/L	0.5	31	1	1	1.6	3.2
Methyl Parathion	ug/L	4	31	0	0	0.25	0.1
Monocrotophos	ug/L	0.5	31	0	0	0.345	0.7
Phorate	ug/L	3.2	31	0	0	0.25	0.1
Sulfotepp	ug/L	8	31	0	0	0.25	0.0
Tetrachlorvinphos (Gardona)	ug/L	3.65	31	0	0	0.25	0.1
Tokuthion	ug/L	0.2	31	0	3	0.25	1.3
Trichloronate	ug/L	0.2	31	0	3	0.25	1.3
norganics	- 9' -		5.		5	1.20	
Nitrate as N	mg/L as N	10	29	29	27	190	19.0
etroleum Compounds	iiig/∟ as N	10	23	23	21	130	19.0
	1100/1	0.9	5	0	0	0.4	0.4
Benzene Bissel Bassa Ossanias	ug/L	0.8				0.1	0.1
Diesel Range Organics	mg/L	0.5	10	2	2	0.67	1.3
Ethylbenzene	ug/L	6	5	0	0	0.1	0.0
Lube Oil	mg/L	0.5	10	0	0	0.23	0.5
m,p-Xylene	ug/L	9	4	0	0	0.2	0.0
o-Xylene	ug/L	9	4	0	0	0.1	0.0
Toluene	ug/L	640	5	0	0	0.5	0.0

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Table 2. Summary of Soil Analytical Results Sunnyside Municipal Airport, Sunnyside, Washington

		Table 749-		SMA-S001	- SMA-S001	- SMA-S002	- SMA-S003	- SMA-S004	-																		
Constituent	Units	3 Value	SL	06	12	12	16	12		SMW-2-S	SP-1-18-S	SP-1-40-S	SP-2-18-S	SP-2-40-S	SP-3-18-S	SP-3-40-S	SP-4-18-S	SP-4-40-S	SP-5-18-S	SP-5-40-S	SP-6-18-S	SP-6-40-S	SP-7-18-S	SP-7-30-S	SP-7-40-S	SP-8-12-S	SP-8-18-S
Organochlorine Pesticides (EPA	Method 8081A	l)																									
4,4'-DDD	ug/kg	750 *	335	160	180	0.4	63	200	U 13	U 12	U 13	26	U 11	U 12	U 11	U 11	U 12	U 11	170	U 12	U 12	U 11	U 12	U 11	U 11	U 12	37
4,4'-DDE	ug/kg	750 *	446	130	930	4.1	680	3400	U 13	U 12	U 13	47	U 11	U 12	U 11	U 11	U 12	U 11	3200	3200	13	U 11	U 12	670	U 11	U 12	1200
4,4'-DDT	ug/kg	750 *	2941	4700	4700	13	1600	4300	16	U 12	170	1200	110	31	U 11	U 11	U 12	U 11	3000	42000	50	U 11	U 12	910	U 11	U 12	880
Aldrin	ug/kg	100	2.52	U 1.1	U 1	U 1.1	U 1.1	U 1.1	U 6.3	U 6.1	U 6.3	U 5.6	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.8	U 5.5	U 6.2	U 5.5	U 5.4	U 6.2	U 5.5
alpha-BHC	ug/kg	6000	0.55	U 1.1	U 1	U 1.1	U 1.1	U 1.1	U 6.3	U 6.1	U 6.3	U 5.6	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.8	U 5.5	U 6.2	U 5.5	U 5.4	U 6.2	U 5.5
alpha-Chlordane	ug/kg	1000	2857	U 1.1	U 1	U 1.1	U 1.1	U 1.1	U 13	U 12	U 13	U 11	15	U 12	U 11	U 11	U 12	U 11	U 11	U 12	U 12	U 11	U 12	U 11	U 11	U 12	U 11
beta-BHC	ug/kg	6000	2.27	U 1.1	U 1	U 1.1	U 1.1	U 1.1	U 6.3	U 6.1	U 6.3	U 5.6	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.8	U 5.5	U 6.2	U 5.5	U 5.4	U 6.2	U 5.5
delta-BHC Dieldrin	ug/kg ug/kg	6000 70	1.02 2.82	U 1.1 30	U 1 180	U 1.1 8.1	U 1.1 U 2.1	U 1.1 U 2.2	U 6.3 U 13	U 6.1 U 12	U 6.3 180	U 5.6 1300	U 5.6 U 11	U 5.8 U 12	U 5.7 13	U 5.6 U 11	U 5.8 U 12	U 5.7 U 11	U 5.6 77	U 5.8 U 12	U 5.8 U 12	U 5.5 U 11	U 6.2 U 12	U 5.5 21	U 5.4 U 11	U 6.2 U 12	U 5.5 17
Endosulfan I	ug/kg	70	304683	5.2	15	U 1.1	U 1.1	U 1.1	U 6.3	U 6.1	U 6.3	30	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.7	25	300	U 5.8	U 5.5	U 6.2	U 5.5	U 5.4	U 6.2	U 5.5
Endosulfan II	ug/kg		304683	48	150	2.7	94	100	U 13	U 12	U 13	23	U 11	U 12	U 11	U 11	U 12	U 11	100	190	U 12	U 11	U 12	U 11	U 11	U 12	U 11
Endosulfan Sulfate	ug/kg		480000	U 2.1	U 2.1	U 2.2	U 2.1	U 2.2	U 13	U 12	U 13	13	U 11	U 12	U 11	U 11	U 12	U 11	190	320	U 12	U 11	U 12	U 11	U 11	U 12	34
Endrin	ug/kg	200	440	U 2.1	U 2.1	2.4	U 2.1	U 2.2	U 13	U 12	U 13	31	U 11	U 12	U 11	U 11	U 12	U 11	180	240	U 12	U 11	U 12	U 11	U 11	U 12	25
Endrin Aldehyde	ug/kg	200	24000	U 2.1	U 2.1	U 2.2	U 2.1	U 2.2	U 13	U 12	19	14	U 11	U 12	U 11	U 11	U 12	U 11	120	270	U 12	U 11	U 12	U 11	U 11	U 12	24
Endrin Ketone	ug/kg	200	8560	U 2.1	U 2.1	0.63	82	U 2.2	U 13	U 12	410	46	U 11	U 12	U 11	U 11	U 12	U 11	92	13	U 12	U 11	U 12	U 11	U 11	U 12	U 11
gamma-BHC	ug/kg	6000	6.21	2.3	6.1	2.7	U 1.1	U 1.1	U 6.3	U 6.1	U 6.3	U 5.6	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.8	U 5.5	U 6.2	U 5.5	U 5.4	U 6.2	U 5.5
gamma-Chlordane	ug/kg		2857	U 1.1	U 1	1.5	U 1.1	U 1.1	U 13	U 12	U 13	U 11	U 11	U 12	U 11	U 11	U 12	U 11	37	35	U 12	U 11	U 12	U 11	U 11	U 12	U 11
Heptachlor	ug/kg	400	3.78	U 1.1	U 1	U 1.1	U 1.1	U 1.1	U 6.3	U 6.1	U 6.3	U 5.6	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.8	U 5.5	U 6.2	U 5.5	U 5.4	U 6.2	U 5.5
Heptachlor Epoxide	ug/kg	400	8.02	5.3	18	U 1.1	7.9	12	U 6.3	U 6.1	U 6.3	U 5.6	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.7	U 5.6	U 5.8	U 5.8	U 5.5	U 6.2	U 5.5	U 5.4	U 6.2	U 5.5
Methoxychlor	ug/kg		64160	U 11	U 10	U 10	U 11	U 11	U 13	U 12	20	150	U 11	U 12	U 11	U 11	U 12	U 11	710	U 12	U 12	U 11	U 12	U 11	U 11	U 12	94
Toxaphene	ug/kg		153	2900	13000	77	7300	11000	U 63	U 61	870	1700	330	130	140	U 56	U 58	U 57	20000	43000	U 58	U 55	U 62	810	U 54	U 62	1800
Chlorinated Herbicides (EPA Mer			0.07	1170	1174	1170	1170	1170	11.10	1144	10	1144	1144	1144	4.4	1144	1144	1 4 4	1144	1144	1144	1140	1140	11.10	11.40	1140	11.10
2,4,5-T 2,4,5-TP (Silvex)	ug/kg ug/kg		0.97 4979	U 7.2 U 7.2	U 7.1 U 7.1	U 7.3 U 7.3	U 7.2 U 7.2	U 7.2 U 7.2	U 12 U 12	U 11 U 12	U 12 U 12	U 11 U 11	U 11 U 11	U 11 U 11	U 11 U 11	U 11 U 11	U 11 U 11	U 11 U 11	U 11 U 11	U 11 U 11	U 11 U 11	U 10 U 10	U 12 U 12	U 10 U 10	U 10 U 10	U 12 U 12	U 10 U 10
2,4-D	ug/kg		860	7	14	U 7.3	U 7.2	31	U 12	U 11	U 12	U 10	U 10	U 11	U 11	U 11	U 11	U 11	U 11	U 11	U 11	U 10	U 12	U 10	U 10	U 12	U 10
2,4-D 2,4-DB	ug/kg		16179	U 7.2	U 7.1	U 7.3	U 7.2	U 7.2	U 12	U 11	U 12	U 11	U 11	U 11	U 11	U 11	U 11	U 11	U 11	U 11	U 11	U 10	U 12	U 10	U 10	U 12	U 10
Dalapon	ug/kg		959	U 27	U 27	U 27	U 27	0	U 290	U 280	U 290	U 260	U 260	U 270	U 260	U 260	U 260	U 260	U 260	U 260	U 260	U 250	U 280	U 250	U 250	U 280	U 250
Dicamba	ug/kg		3258	U 18	U 12	U 11	U 12	U 10	U 10	U 11	U 11	U 11	U 11	U 11	U 11	U 11	U 11	U 10	U 12	U 10	U 10	U 12	U 10				
Dichlorprop	ug/kg		0.98	U 7.2	U 7.1	U 7.3	U 7.2	U 7.2	U 89	U 86	U 89	U 79	U 79	U 82	U 80	U 79	U 82	U 80	U 80	U 81	U 82	U 78	U 88	U 78	U 77	U 88	U 77
Dinoseb	ug/kg		688	U 18	U 18	10	U 18	U 18	U 12	9100	110	19	57	86	U 11	U 11	U 11	U 11	U 11	U 11	U 11	U 10	U 12	U 10	U 10	U 12	U 10
MCPA	ug/kg		424	U 7.2	U 7.1	U 7.3	U 7.2	U 7.2	U 1200	U 1100	U 1200	U 1000	U 1000	U 1100	U 1100	U 1000	U 1100	U 1000	U 1200	U 1000	U 1000	U 1200	U 1000				
MCPP	ug/kg		498	U 7.2	U 7.1	U 7.3	U 7.2	U 7.2	U 1200	U 1100	U 1200	U 1000	U 1000	U 1100	U 1100	U 1000	U 1100	U 1100	U 1100	U 1100	1100	U 1000	U 1200	U 1000	U 1000	U 1200	U 1000
Pentachlorophenol	ug/kg	3000	3.47	13	6.5	U 18	U 18	U 18	U 6	U 5.8	U 6	U 5.3	U 5.3	U 5.5	U 5.4	U 5.3	U 5.5	U 5.4	U 5.4	U 5.5	U 5.5	U 5.2	U 5.9	U 5.2	U 5.1	U 5.9	U 5.2
Organophosphorous Pesticides	(EPA Method 8	8270D-SIM)																									
Azinphos-methyl/Guthion	mg/kg		0.005						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.023	0.023	U 0.023	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022
Bolstar/Sulprofos	mg/kg		10.28						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Chlorpyrifos/Dursban Coumaphos	mg/kg		43.89						U 0.025 U 0.025	U 0.024 U 0.024	U 0.025 U 0.025	U 0.022 U 0.022	U 0.022 U 0.022	U 0.023 U 0.023	U 0.023 U 0.023	U 0.022 U 0.022	U 0.023 U 0.023	U 0.022 U 0.022	U 0.025 U 0.025	U 0.022 U 0.022	U 0.022 U 0.022	U 0.025 U 0.025	U 0.022 U 0.022				
Demeton-S	mg/kg mg/kg		3.2						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Diazinon	mg/kg		0.03						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Dichlorvos(DDVP)	mg/kg		3.45						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Dimethoate	mg/kg		0.013						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Disulfoton	mg/kg		0.095						U 0.025	0.11	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
EPN	mg/kg		0.024						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.023	0.025	U 0.023	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022
Ethoprophos	mg/kg		0.01						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Fenchlorphos/Ronnel	mg/kg		4000						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Fensulfothion	mg/kg		0.06						U 0.063	U 0.061	U 0.063	U 0.056	U 0.056	U 0.058	U 0.057	U 0.056	U 0.058	U 0.057	0.077	0.12	U 0.058	U 0.055	U 0.062	U 0.055	U 0.054	U 0.062	U 0.055
Fenthion	mg/kg		0.025						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Malathion	mg/kg		2.52						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Merphos&Merphos-oxone	mg/kg		2.21						U 0.063	U 0.061	U 0.063	U 0.056	U 0.056	U 0.058	U 0.057	U 0.056	U 0.058	U 0.057	U 0.056	U 0.058	U 0.058	U 0.055	U 0.062	U 0.055	U 0.054	U 0.062	U 0.055
Mevinphos/Phosdrin Monocrotophos	mg/kg		0.025						U 0.025 U 0.063	U 0.024 U 0.061	U 0.025 U 0.063	U 0.022 U 0.056	U 0.022 U 0.056	U 0.023 U 0.058	U 0.023 U 0.057	U 0.022 U 0.056	U 0.023 U 0.058	U 0.023 U 0.057	U 0.023 U 0.056	U 0.023 U 0.058	U 0.023 U 0.058	U 0.022 U 0.055	U 0.025 U 0.062	U 0.022 U 0.055	U 0.022 U 0.054	U 0.025 U 0.062	U 0.022 U 0.055
Naled	mg/kg mg/kg		160						U 0.083	U 0.081	U 0.063	U 0.056	U 0.056	U 0.058	U 0.057	U 0.022	U 0.058	U 0.023	U 0.056	U 0.058	U 0.058	U 0.055	U 0.062	U 0.055	U 0.054	U 0.062	U 0.055
Parathion-ethyl	mg/kg mg/kg		10.72						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Parathion-methyl	mg/kg		0.45						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Phorate	mg/kg		1.62						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Stirofos/Tetrachlorvinphos	mg/kg		41.7						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Sulfotepp	mg/kg		1.56						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Tokuthion/Prothiofos	mg/kg		98.19						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
Trichloronate	mg/kg		0.17						U 0.025	U 0.024	U 0.025	U 0.022	U 0.022	U 0.023	U 0.023	U 0.022	U 0.023	U 0.022	U 0.025	U 0.022	U 0.022	U 0.025	U 0.022				
	~ ~						_						_						_		_						
		-												-													
Petroleum Compounds (NWTPH		od 8260C)																									
Benzene	mg/kg		0.0045								U 0.001		U 0.0011		U 0.00097				U 0.001		U 0.00092						
Toluene	mg/kg		0.052								U 0.0052		U 0.0054		0.034				U 0.0052		U 0.0046						
Ethylbenzene	mg/kg		0.082								U 0.001		U 0.0011		0.0012				U 0.001		U 0.00092						
m,p-Xylene	mg/kg		4.46								U 0.0021		U 0.0022		0.0041				U 0.0021		U 0.0018						
o-Xylene Naphthalene	mg/kg mg/kg		0.082 4.65								U 0.001 U 0.001		U 0.0011 U 0.0011		0.0012 U 0.00097				U 0.001 U 0.001		U 0.00092 U 0.00092						
Diesel Range Organics	mg/kg		2000	U 53	U 52	U 53	U 52	94			U 31		U 0.0011		U 0.00097				U 140		U 29						
Lube Oil Range Organics	mg/kg		2000	U 110	U 100	U 110	U 100	710			U 63		U 56		U 57				400		U 58						
Labo on range Organica	iiig/ng		2000	0 110	0 100	0 110	0 100	. 10			0.00		0.00		0.01				-100		0.00					-	

Toluene	mg/kg	0.052						 	U 0.0052	 U 0.0054	 0.034	 	 U 0.0052	
Ethylbenzene	mg/kg	0.082						 	U 0.001	 U 0.0011	 0.0012	 	 U 0.001	
m,p-Xylene	mg/kg	4.46						 	U 0.0021	 U 0.0022	 0.0041	 	 U 0.0021	
o-Xylene	mg/kg	0.082						 	U 0.001	 U 0.0011	 0.0012	 	 U 0.001	
Naphthalene	mg/kg	4.65						 	U 0.001	 U 0.0011	 U 0.00097	 	 U 0.001	
Diesel Range Organics	mg/kg	2000	U 53	U 52	U 53	U 52	94	 	U 31	 U 28	 U 28	 	 U 140	
Lube Oil Range Organics	mg/kg	2000	U 110	U 100	U 110	U 100	710	 	U 63	 U 56	 U 57	 	 400	

Notes:

Additional data discussion in the Remedial Investigation Report (PGG, 2014) * Total DDE, DDT, DDD based on Table 749-3 comments.

Table 2. Summary of Soil Analytical Results Sunnyside Municipal Airport, Sunnyside, Washington

		Table 749-				SD 10 19	SD 11 10	SD 12 122	SB 12 144	CD 12 10	SB 12 220	SB 12 40	CD 12 10	SB 12 40	SD 14 19	SB 14 40	SD 15 19	SP-15-40-	SP-16-12-	SD 16 19	SP-16-40-	SP-17-18-	SB 17 40		
Constituent	Units	3 Value	SL	SP-8-40-S	SP-9-18-S		SP-11-16- S	SP-12-122	SP-12-144- S	SP-12-18-	SP-12-230- S	SP-12-40- S	SP-13-16-	SP-13-40- S	SP-14-16- S	SP-14-40- S	SP-15-16-	SP-15-40- S	SP-16-12- S	SP-10-18- S	SP-16-40- S	SP-17-16- S	SP-17-40- S	SP-18-2-S	SP-18-6-8
rganochlorine Pesticides (EPA		/	005	11.40	11.4.4	11.4.4	11.4.4	11.40	11.40	11.4.4	11.40	11.40	11.4.4	11.40	11.4.4	11.40	11.4.4	11.40	11.40	11.4.4	11.40	11.4.4	11.40	11.40	11.40
4,4'-DDD 4,4'-DDE	ug/kg ug/kg	750 * 750 *	335 446	U 12 U 12	U 11 100	U 11 43	U 11 18	U 13 U 13	U 13 U 13	U 11 U 11	U 12 U 12	U 12 U 12	U 11 260	U 12 U 12	U 11 20	U 12 U 12	U 11 U 11	U 12 12	U 13 U 13	U 11 U 11	U 12 U 12	U 11 420	U 12 U 12	U 12 48	U 12 U 12
4,4'-DDT	ug/kg	750 *	2941	U 12	U 11	U 11	U 11	U 13	U 13	U 11	U 12	U 12	96	U 12	U 11	U 12	22	66	U 13	U 11	U 12	1300	U 12	140	U 12
Aldrin	ug/kg	100	2.52	U 6.1	U 5.5	U 5.4	U 5.6	U 6.4	U 6.4	U 5.7	U 6.2	U 5.8	U 5.7	U 5.9	U 5.6	U 6.1	U 5.6	U 5.9	U 6.5	U 5.5	U 6	U 5.7	U 6.2	U 6.1	U 6.2
alpha-BHC	ug/kg	6000	0.55	U 6.1	U 5.5	U 5.4	U 5.6	U 6.4	U 6.4	U 5.7	U 6.2	U 5.8	U 5.7	U 5.9	U 5.6	U 6.1	U 5.6	U 5.9	U 6.5	U 5.5	U 6	U 5.7	U 6.2	U 6.1	U 6.2
alpha-Chlordane	ug/kg	1000	2857	U 12	U 11	U 11	U 11	U 13	U 13	U 11	U 12	U 12	U 11	U 12	U 11	U 12	U 11	U 12	U 13	U 11	U 12	U 11	U 12	U 12	U 12
beta-BHC	ug/kg	6000	2.27	U 6.1	U 5.5	U 5.4	U 5.6	U 6.4	U 6.4	U 5.7	U 6.2	U 5.8	U 5.7	U 5.9	U 5.6	U 6.1	U 5.6	U 5.9	U 6.5	U 5.5	U 6	U 5.7	U 6.2	U 6.1	U 6.2
delta-BHC Dieldrin	ug/kg	6000 70	1.02 2.82	U 6.1 U 12	U 5.5 U 11	U 5.4	U 5.6 U 11	U 6.4 U 13	U 6.4	U 5.7 U 11	U 6.2 U 12	U 5.8	U 5.7 U 11	U 5.9 U 12	U 5.6 U 11	U 6.1 U 12	U 5.6	U 5.9 U 12	U 6.5 U 13	U 5.5	U 6 U 12	U 5.7 33	U 6.2 U 12	U 6.1 U 12	U 6.2 U 12
Endosulfan I	ug/kg ug/kg	70	304683	U 6.1	U 5.5	U 11 U 5.4	U 5.6	U 6.4	U 13 U 6.4	U 5.7	U 6.2	U 12 U 5.8	U 5.7	U 5.9	U 5.6	U 6.1	U 11 U 5.6	U 5.9	U 6.5	U 11 U 5.5	U 6	13	U 6.2	150	U 6.2
Endosulfan II	ug/kg		304683	U 12	U 11	U 11	U 11	U 13	U 13	U 11	U 12	U 12	U 11	U 12	U 11	U 12	U 11	U 12	U 13	U 11	U 12	120	U 12	99	U 12
Endosulfan Sulfate	ug/kg		480000	U 12	U 11	U 11	U 11	U 13	U 13	U 11	U 12	U 12	U 11	U 12	U 11	U 12	U 11	U 12	U 13	U 11	U 12	150	U 12	U 12	U 12
Endrin	ug/kg	200	440	U 12	U 11	U 11	U 11	U 13	U 13	U 11	U 12	U 12	U 11	U 12	U 11	U 12	U 11	U 12	U 13	U 11	U 12	140	U 12	U 12	U 12
Endrin Aldehyde	ug/kg	200	24000	U 12	U 11	U 11	U 11	U 13	U 13	U 11	U 12	U 12	U 11	U 12	U 11	U 12	U 11	U 12	U 13	U 11	U 12	81	U 12	36	U 12
Endrin Ketone	ug/kg	200	8560	U 12	U 11	U 11	U 11	U 13	U 13	U 11	U 12	U 12	U 11	U 12	U 11	U 12	U 11	U 12	U 13	U 11	U 12	48	U 12	U 12	U 12
gamma-BHC	ug/kg	6000	6.21	U 6.1	U 5.5	U 5.4	U 5.6	U 6.4	U 6.4	U 5.7	U 6.2	U 5.8	U 5.7	U 5.9	U 5.6	U 6.1	U 5.6	U 5.9	U 6.5	U 5.5	U 6	7.6	U 6.2	11	U 6.2
gamma-Chlordane Heptachlor	ug/kg ug/kg	400	2857 3.78	U 12 U 6.1	U 11 U 5.5	U 11 U 5.4	U 11 U 5.6	U 13 U 6.4	U 13 U 6.4	U 11 U 5.7	U 12 U 6.2	U 12 U 5.8	U 11 U 5.7	U 12 U 5.9	U 11 U 5.6	U 12 U 6.1	U 11 U 5.6	U 12 U 5.9	U 13 U 6.5	U 11 U 5.5	U 12 U 6	U 11 U 5.7	U 12 U 6.2	U 12 U 6.1	U 12 U 6.2
Heptachlor Epoxide	ug/kg	400	8.02	U 6.1	U 5.5	U 5.4	U 5.6	U 6.4	U 6.4	U 5.7	U 6.2	U 5.8	U 5.7	U 5.9	U 5.6	U 6.1	U 5.6	U 5.9	U 6.5	U 5.5	U 6	23	U 6.2	U 6.1	U 6.2
Methoxychlor	ug/kg		64160	U 12	U 11	U 11	U 11	U 13	U 13	U 11	U 12	U 12	U 11	U 12	U 11	U 12	U 11	U 12	U 13	U 11	U 12	420	U 12	U 12	U 12
Toxaphene	ug/kg		153	U 61	U 55	U 54	U 56	U 64	U 64	U 57	U 62	U 58	360	U 59	U 56	U 61	U 56	U 59	U 65	U 55	U 60	13000	U 62	1900	U 62
nlorinated Herbicides (EPA Met																									
2,4,5-T	ug/kg		0.97	U 12	U 10	U 10	U 11	U 12	U 12	U 11	U 12	U 11	U 11	U 11	U 11	U 12	U 11	U 11	U 12	U 10	U 11	U 11	U 12	U 12	U 12
2,4,5-TP (Silvex) 2,4-D	ug/kg		4979 860	U 12 U 12	U 10 U 10	U 10 U 10	U 11 U 11	U 12 U 12	U 12 U 12	U 11 U 11	U 12 U 12	U 11 U 11	U 11 U 11	U 11 U 11	U 11 U 10	U 12 U 11	U 11 U 11	U 11 U 11	U 12 U 12	U 10 U 10	U 11 U 11	U 11 U 11	U 12 U 12	U 12 12	U 12 U 12
2,4-D 2,4-DB	ug/kg ug/kg		16179	U 12	U 10	U 10	U 11	U 12	U 12	U 11	U 12	U 11	U 11	U 11	U 10	U 12	U 11	U 11	U 12	U 10	U 11	U 11	U 12	U 12	U 12
Dalapon	ug/kg		959	U 280	U 250	U 250	U 260	U 300	U 290	U 260	U 290	U 270	U 260	U 270	U 250	U 280	U 260	U 270	U 300	U 250	U 280	U 260	U 280	U 280	U 290
Dicamba	ug/kg		3258	U 12	U 10	U 10	U 11	U 12	U 12	U 11	U 12	U 11	U 11	U 11	U 10	U 11	U 11	U 11	U 12	U 10	U 11	U 11	U 12	U 11	U 12
Dichlorprop	ug/kg		0.98	U 87	U 78	U 77	U 79	U 91	U 90	U 81	U 88	U 83	U 81	U 83	U 79	U 86	U 80	U 84	U 92	U 78	U 85	U 81	U 88	U 86	U 88
Dinoseb	ug/kg		688	U 12	U 10	U 10	U 11	U 12	U 12	U 11	47	U 11	74	89	U 12	U 10	U 11	U 11	U 12	U 12	U 12				
MCPA	ug/kg		424	U 1100	U 1000	U 1000	U 1000	U 1200	U 1200	U 1100	U 1200	U 1100	U 1100	U 1100	U 1000	U 1100	U 1100	U 1100	U 1200	U 1000	U 1100	U 1100	U 1200	U 1100	U 1200
MCPP	ug/kg		498	U 1100	U 1000	U 1000	U 1000	U 1200	U 1200	U 1100	U 1200	U 1100	U 1100	U 1100	U 1000	U 1100	U 1100	U 1100	U 1200	U 1000	U 1100	U 1100	U 1200	U 1100	U 1200
Pentachlorophenol	ug/kg	3000 8270D-SIM)	3.47	U 5.8	U 5.2	U 5.2	U 5.3	U 6.1	U 6.1	U 5.4	U 5.9	U 5.5	U 5.5	U 5.6	U 5.3	U 5.8	U 5.4	U 5.6	U 6.1	U 5.2	U 5.7	U 5.4	U 5.9	U 5.8	U 5.9
rganophosphorous Pesticides Azinphos-methyl/Guthion	mg/kg	8270D-SIIVI)	0.005	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Bolstar/Sulprofos	mg/kg		10.28	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Chlorpyrifos/Dursban	mg/kg		43.89	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Coumaphos	mg/kg		0.06	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Demeton-S	mg/kg		3.2	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Diazinon	mg/kg		0.03	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Dichlorvos(DDVP) Dimethoate	mg/kg		3.45 0.013	U 0.025 U 0.025	U 0.022 U 0.022	U 0.022 U 0.022	U 0.022 U 0.022	U 0.026 U 0.026	U 0.026 U 0.026	U 0.023 U 0.023	U 0.025 U 0.025	U 0.023 U 0.023	U 0.023 U 0.023	U 0.024 U 0.024	U 0.022 U 0.022	U 0.024 U 0.024	U 0.023 U 0.023	U 0.024 U 0.024	U 0.026 U 0.026	U 0.022 U 0.022	U 0.024 U 0.024	U 0.023 U 0.023	U 0.025 U 0.025	U 0.024 U 0.024	U 0.025 U 0.025
Disulfoton	mg/kg mg/kg		0.013	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
EPN	mg/kg		0.000	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Ethoprophos	mg/kg		0.01	U 0.025	U 0.022	U 0.022	U 0.022	0.11	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Fenchlorphos/Ronnel	mg/kg		4000	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Fensulfothion	mg/kg		0.06	U 0.061	U 0.055	U 0.054	U 0.056	U 0.064	U 0.064	U 0.057	U 0.062	U 0.058	U 0.057	U 0.059	U 0.056	U 0.061	U 0.056	U 0.059	U 0.065	U 0.055	U 0.06	U 0.057	U 0.062	U 0.061	U 0.062
Fenthion	mg/kg		0.025	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Malathion	mg/kg		2.52	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Merphos&Merphos-oxone Mevinphos/Phosdrin	mg/kg mg/kg		2.21 0.025	U 0.061 U 0.025	U 0.055 U 0.022	U 0.054 U 0.022	U 0.056 U 0.022	U 0.064 U 0.026	U 0.064 U 0.026	U 0.057 U 0.023	U 0.062 U 0.025	U 0.058 U 0.023	U 0.057 U 0.023	U 0.059 U 0.024	U 0.056 U 0.022	U 0.061 U 0.024	U 0.056 U 0.023	U 0.059 U 0.024	U 0.065 U 0.026	U 0.055 U 0.022	U 0.06 U 0.024	U 0.057 U 0.023	U 0.062 U 0.025	U 0.061 U 0.024	U 0.062 U 0.025
Monocrotophos	mg/kg mg/kg		0.025	U 0.023	U 0.022	U 0.022	U 0.022	U 0.028	U 0.028	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Naled	mg/kg		160	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Parathion-ethyl	mg/kg		10.72	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Parathion-methyl	mg/kg		0.45	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Phorate	mg/kg		1.62	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Stirofos/Tetrachlorvinphos	mg/kg		41.7	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Sulfotepp Tokuthion/Prothiofos	mg/kg		1.56	U 0.025	U 0.022	U 0.022	U 0.022	U 0.026	U 0.026	U 0.023	U 0.025	U 0.023	U 0.023	U 0.024	U 0.022	U 0.024	U 0.023	U 0.024	U 0.026	U 0.022	U 0.024	U 0.023	U 0.025	U 0.024	U 0.025
Tokuthion/Prothiofos Trichloronate	mg/kg mg/kg		98.19 0.17	U 0.025 U 0.025	U 0.022 U 0.022	U 0.022 U 0.022	U 0.022 U 0.022	U 0.026 U 0.026	U 0.026 U 0.026	U 0.023 U 0.023	U 0.025 U 0.025	U 0.023 U 0.023	U 0.023 U 0.023	U 0.024 U 0.024	U 0.022 U 0.022	U 0.024 U 0.024	U 0.023 U 0.023	U 0.024 U 0.024	U 0.026 U 0.026	U 0.022 U 0.022	U 0.024 U 0.024	U 0.023 U 0.023	U 0.025 U 0.025	U 0.024 U 0.024	U 0.025 U 0.025
			0.11	0 0.020	0 0.012	0 0.022	0 01022	0 01020	0 01020	0 01020	0 0.020	0 01020	0 01020	0 0.02 1	0 0.012	0 0102 1	0 01020	0 0.02 1	0 0.020	0 010LL	0 0102 1	0 0.020	0 0.020	0 0.02 1	0 0.020
troleum Compounds (NWTPH		hod 8260C)																							
Benzene	mg/kg		0.0045					0.0032	0.0027		U 0.00096														
Toluene	mg/kg		0.052					U 0.0047	U 0.0048		U 0.0048														
Ethylbenzene	mg/kg		0.082					0.003	U 0.00096		U 0.00096														
m,p-Xylene o-Xylene	mg/kg		4.46					0.039	U 0.0019 U 0.00096		U 0.0019 U 0.00096														
Naphthalene	mg/kg mg/kg		4.65					0.037	0.00096		U 0.00096														
Diesel Range Organics	mg/kg		2000					220	U 32		U 31														
Lube Oil Range Organics	mg/kg		2000					U 65	U 64		U 63														
· •	~ ~																								

troleum Compounds (NWTPH	and EPA Method 82	60C)										
Benzene	mg/kg	0.0045	 	 	0.0032	0.0027	 U 0.00096	 	 	 	 	
Toluene	mg/kg	0.052	 	 	U 0.0047	U 0.0048	 U 0.0048	 	 	 	 	
Ethylbenzene	mg/kg	0.082	 	 	0.003	U 0.00096	 U 0.00096	 	 	 	 	
m,p-Xylene	mg/kg	4.46	 	 	0.039	U 0.0019	 U 0.0019	 	 	 	 	
o-Xylene	mg/kg	0.082	 	 	0.037	U 0.00096	 U 0.00096	 	 	 	 	
Naphthalene	mg/kg	4.65	 	 	0.16	0.042	 U 0.00096	 	 	 	 	
Diesel Range Organics	mg/kg	2000	 	 	220	U 32	 U 31	 	 	 	 	
Lube Oil Range Organics	mg/kg	2000	 	 	U 65	U 64	 U 63	 	 	 	 	

Notes: Additional data discussion in the Remedial Investigation Report (PGG, 2014) * Total DDE, DDT, DDD based on Table 749-3 comments.

Table 2. Summary of Soil Analytical Results Sunnyside Municipal Airport, Sunnyside, Washington

Constituent	Units	Table 749- 3 Value	SL	SP-19-2-S	SP-19-5-S	SP-20-2-S	SP-20-6-S	SP-21-2-S	SP-21-6-S	SP-22-2-S	SP-22-5-S	SP-23-2-S	SP-23-6-S	SP-24-2-S	SP-24-5-S	SP-26-2-S	SP-26-5-S	SP-27-2-S	SP-27-6-S	SP-28-2-S	SP-29-2-S	SP-30-2-S	SP-30-5-S	SP-31-2-S	SP-31-5-S	SP-37-0.5	SP-38-0.5
Organochlorine Pesticides (EPA	Method 8081	A)																									
4,4'-DDD	ug/kg	750 *	335	U 11	U 12	U 11	U 11	U 12	U 11	63	U 12	U 11	U 12	U 11	U 12	U 12	U 13	U 11	U 12	U 12	U 12	U 12	U 11	U 12	U 12	180	14000
4,4'-DDE	ug/kg	750 *	446	U 11	U 12	23	U 11	U 12	U 11	10000	50	U 11	U 12	U 11	U 12	270	16	U 11	U 12	U 12	U 12	71	U 11	U 12	U 12	790	17000
4,4'-DDT	ug/kg	750 *	2941	U 11	U 12	U 11	U 11	U 12	U 11	9900	21	U 11	U 12	U 11	U 12	180	21	U 11	U 12	U 12	U 12	18	U 11	U 12	U 12	3600	150000
Aldrin	ug/kg	100	2.52	U 5.6	U 5.9	U 5.6	U 5.3	U 5.8	U 5.5	U 5.5	U 6	U 5.6	U 6.2	U 5.6	U 5.8	U 5.8	U 6.5	U 5.5	U 5.9	U 5.9	U 5.9	U 6.1	U 5.7	U 5.9	U 5.9	U 5.6	U 1100
alpha-BHC	ug/kg	6000	0.55	U 5.6	U 5.9	U 5.6	U 5.3	U 5.8	U 5.5	U 5.5	U 6	U 5.6	U 6.2	U 5.6	U 5.8	U 5.8	U 6.5	U 5.5	U 5.9	U 5.9	U 5.9	U 6.1	U 5.7	U 5.9	U 5.9	U 5.6	U 1100
		1000	2857	U 11	U 12	U 11	U 11	U 12	U 11	U 11	U 12	U 11	U 12	U 11	U 12	U 12	U 13	U 11	U 12	U 12	U 12	U 12	U 11	U 12	U 12	P 15	U 2100
alpha-Chlordane	ug/kg		2.27	U 5.6	U 5.9	U 5.6	U 5.3	U 5.8	U 5.5	U 5.5	U 6	U 5.6	U 6.2	U 5.6	U 5.8	U 5.8	U 6.5	U 5.5	U 5.9	U 5.9	U 5.9	U 6.1	U 5.7	U 5.9	U 5.9	U 5.6	U 1100
beta-BHC	ug/kg	6000																									
delta-BHC	ug/kg	6000	1.02	U 5.6	U 5.9	U 5.6	U 5.3	U 5.8	U 5.5	U 5.5	U 6	U 5.6	U 6.2	U 5.6	U 5.8	U 5.8	U 6.5	U 5.5	U 5.9	U 5.9	U 5.9	U 6.1	U 5.7	U 5.9	U 5.9	U 5.6	U 1100
Dieldrin	ug/kg	70	2.82	U 11	U 12	U 11	U 11	U 12	U 11	U 11	U 12	U 11	U 12	U 11	U 12	U 12	U 13	17	U 12	U 12	U 12	U 12	U 11	U 12	U 12	U 11	4100
Endosulfan I	ug/kg		304683	U 5.6	U 5.9	U 5.6	U 5.3	U 5.8	U 5.5	U 5.5	U 6	U 5.6	U 6.2	U 5.6	U 5.8	U 5.8	U 6.5	U 5.5	U 5.9	U 5.9	U 5.9	U 6.1	U 5.7	U 5.9	U 5.9	79	5000
Endosulfan II	ug/kg		304683	U 11	U 12	U 11	U 11	U 12	U 11	55	U 12	U 11	U 12	U 11	U 12	U 12	U 13	U 11	U 12	U 12	U 12	U 12	U 11	U 12	U 12	190	7400
Endosulfan Sulfate	ug/kg		480000	U 11	U 12	U 11	U 11	U 12	U 11	71	U 12	U 11	U 12	U 11	U 12	U 12	U 13	U 11	U 12	U 12	U 12	U 12	U 11	U 12	U 12	P 82	U 2100
Endrin	ug/kg	200	440	U 11	U 12	U 11	U 11	U 12	U 11	U 11	U 12	U 11	U 12	U 11	U 12	U 12	U 13	U 11	U 12	U 12	U 12	U 12	U 11	U 12	U 12	U 11	U 2100
Endrin Aldehyde	ug/kg	200	24000	U 11	U 12	U 11	U 11	U 12	U 11	210	U 12	U 11	U 12	U 11	U 12	U 12	U 13	U 11	U 12	U 12	U 12	U 12	U 11	U 12	U 12	P 120	P 5900
Endrin Ketone	ug/kg	200	8560	U 11	U 12	U 11	U 11	U 12	U 11	27	U 12	U 11	U 12	U 11	U 12	U 12	U 13	U 11	U 12	U 12	U 12	U 12	U 11	U 12	U 12	U 11	U 2100
gamma-BHC	ug/kg	6000	6.21	U 5.6	U 5.9	U 5.6	U 5.3	U 5.8	U 5.5	U 5.5	U 6	U 5.6	U 6.2	U 5.6	U 5.8	U 5.8	U 6.5	U 5.5	U 5.9	U 5.9	U 5.9	U 6.1	U 5.7	U 5.9	U 5.9	25	U 1100
gamma-Chlordane	ug/kg		2857	U 11	U 12	U 11	U 11	U 12	U 11	U 11	U 12	U 11	U 12	U 11	U 12	U 12	U 13	U 11	U 12	U 12	U 12	U 12	U 11	U 12	U 12	P 22	U 2100
Heptachlor	ug/kg	400	3.78	U 5.6	U 5.9	U 5.6	U 5.3	U 5.8	U 5.5	U 5.5	U 6	U 5.6	U 6.2	U 5.6	U 5.8	U 5.8	U 6.5	U 5.5	U 5.9	U 5.9	U 5.9	U 6.1	U 5.7	U 5.9	U 5.9	U 5.6	U 1100
Heptachlor Epoxide	ug/kg	400	8.02	U 5.6	U 5.9	U 5.6	U 5.3	U 5.8	U 5.5	10	U 6	U 5.6	U 6.2	U 5.6	U 5.8	U 5.8	U 6.5	U 5.5	U 5.9	U 5.9	U 5.9	U 6.1	U 5.7	U 5.9	U 5.9	P 28	U 1100
Methoxychlor	ug/kg		64160	U 11	U 12	U 11	U 11	U 12	U 11	U 11	U 12	U 11	U 12	U 11	U 12	U 12	U 13	U 11	U 12	U 12	U 12	U 12	U 11	U 12	U 12	P 400	P 15000
Toxaphene	ug/kg		153	U 56	U 59	U 56	U 53	U 58	U 55	7000	U 60	U 56	U 62	U 56	U 58	930	U 65	460	U 59	U 59	U 59	U 61	U 57	U 59	U 59	12000	320000
			100	0.00	0.08	0.00	0.00	0.00	0.00	7000	0.00	0.00	0.02	0.00	0.00	330	0.00	400	0.08	0.09	0.08	0.01	0.07	0.58	0.09	12000	320000
Chlorinated Herbicides (EPA Me			0.07	1144	11.4.4	1144	1140	1144	1140	1140	11.4.4	1144	1140	1144	1144	1144	11.40	1140	11.4.4	1144		1140	1144	1140	1144	1144	11.40
2,4,5-T	ug/kg		0.97	U 11	U 11	U 11	U 10	U 11	U 10	U 10	U 11	U 11	U 12	U 11	U 11	U 11	U 12	U 10	U 11	U 11	U 11	U 12	U 11	U 13	U 11	U 11	U 10
2,4,5-TP (Silvex)	ug/kg		4979	U 11	U 11	U 11	U 10	U 11	U 10	U 10	U 11	U 11	U 12	U 11	U 11	U 11	U 12	U 10	U 11	U 11	U 11	U 12	U 11	U 13	U 11	U 11	P 13
2,4-D	ug/kg		860	U 11	U 11	U 10	U 10	U 11	U 10	U 10	U 11	U 11	U 12	U 11	U 11	U 11	U 12	U 10	U 11	U 13	U 11	P 21	P 11				
2,4-DB	ug/kg		16179	U 11	U 11	U 11	U 10	U 11	U 10	U 10	U 11	U 11	U 12	U 11	U 11	U 11	U 12	U 10	U 11	U 11	U 11	U 12	U 11	U 13	U 11	U 11	140
Dalapon	ug/kg		959	U 260	U 270	U 250	U 240	U 260	U 250	U 250	U 270	U 260	U 280	U 260	U 270	U 260	U 300	U 250	U 270	U 270	U 270	U 280	U 260	U 310	U 270	U 200	U 200
Dicamba	ug/kg		3258	U 11	U 11	U 10	U 10	U 11	U 10	U 10	U 11	U 11	U 12	U 11	U 11	U 11	U 12	U 10	U 11	U 13	U 11	U 10	U 10				
Dichlorprop	ug/kg		0.98	U 80	U 84	U 79	U 75	U 82	U 78	U 78	U 85	U 79	U 88	U 80	U 82	U 81	U 91	U 78	U 83	U 84	U 83	U 86	U 81	U 94	U 84	U 79	U 75
Dinoseb	ug/kg		688	U 11	U 11	U 11	U 10	U 11	U 10	U 10	U 11	U 11	U 12	U 11	U 11	U 11	U 12	U 10	U 11	U 13	U 11	P 11	330				
MCPA	ug/kg		424	U 1100	U 1100	U 1000	U 990	U 1100	U 1000	U 1000	U 1100	U 1000	U 1200	U 1100	U 1100	U 1100	U 1200	U 1000	U 1100	U 1200	U 1100	U 2600	U 2500				
MCPP	ug/kg		498	U 1100	U 1100	U 1000	U 990	U 1100	U 1000	U 1000	U 1100	U 1000	U 1200	U 1100	U 1100	U 1100	U 1200	U 1000	U 1100	U 1200	U 1100	U 1000	U 1000				
Pentachlorophenol	ug/kg	3000	3.47	U 5.3	U 5.6	U 5.3	U 5	U 5.5	U 5.2	U 5.2	U 5.7	U 5.3	U 5.9	U 5.4	U 5.5	U 5.5	U 6.1	U 5.2	U 5.6	U 5.6	U 5.6	U 5.8	U 5.4	U 6.3	U 5.6	U 5.3	U 5.1
Organophosphorous Pesticides			0.11	0 0.0	0 0.0	0.010	00	0.010	0 0.12	0 012	0.011	0 0.0	0 0.0	0 0.1	0 0.0	0.010	0 011	0 0.12	0 0.0	0 0.0	0 0.0	0 0.0	0 011	0 0.0	0 0.0	0 0.0	0 011
Azinphos-methyl/Guthion	mg/kg		0.005	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Bolstar/Sulprofos	mg/kg		10.28	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Chlorpyrifos/Dursban			43.89	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
	mg/kg																										
Coumaphos	mg/kg		0.06	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Demeton-S	mg/kg		3.2	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Diazinon	mg/kg		0.03	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Dichlorvos(DDVP)	mg/kg		3.45	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Dimethoate	mg/kg		0.013	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	0.4	3.3	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Disulfoton	mg/kg		0.095	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	0.028	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
EPN	mg/kg		0.024	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Ethoprophos	mg/kg		0.01	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Fenchlorphos/Ronnel	mg/kg		4000	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Fensulfothion	mg/kg		0.06	U 0.056	U 0.059	U 0.056	U 0.053	U 0.058	U 0.055	U 0.055	U 0.06	U 0.056	U 0.062	U 0.056	U 0.058	U 0.058	U 0.065	U 0.055	U 0.059	U 0.059	U 0.059	U 0.061	U 0.057	U 0.067	U 0.059		
Fenthion	mg/kg		0.025	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Malathion	mg/kg		2.52	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Merphos&Merphos-oxone	mg/kg		2.21	U 0.056	U 0.059	U 0.056	U 0.053	U 0.058	U 0.055	0.087	U 0.06	U 0.056	U 0.062	U 0.056	U 0.058	U 0.058	U 0.065	U 0.055	U 0.059	U 0.059	U 0.059	U 0.061	U 0.057	U 0.067	U 0.059		
Meriphosamerphos-oxone Mevinphos/Phosdrin			0.025	U 0 022	U 0 024	U 0 022	U 0 021	U 0 023	U 0 022	U 0 022	U 0 024	U 0 022	U 0 025	U 0 023	U 0 023	U 0 023	U 0 026	U 0 022	U 0 023	U 0 024	U 0 024	U 0 024	0 0.007	U 0 027	U 0 024		
Monocrotophos	mg/kg mg/kg		0.025	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.023	U 0.023	U 0.023	U 0.023	U 0.026	U 0.055	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Naled			160	U 0.038	U 0.039	U 0.038	U 0.033	U 0.038	U 0.035	U 0.033	U 0.024	U 0.038	U 0.025	U 0.038	U 0.038	U 0.038	U 0.085	U 0.022	U 0.039	U 0.039	U 0.039	U 0.024	U 0.023	U 0.007	U 0.039		
	mg/kg																										
Parathion-ethyl	mg/kg		10.72	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Parathion-methyl	mg/kg		0.45	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Phorate	mg/kg		1.62	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Stirofos/Tetrachlorvinphos	mg/kg		41.7	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Sulfotepp	mg/kg		1.56	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Tokuthion/Prothiofos	mg/kg		98.19	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
Trichloronate	mg/kg		0.17	U 0.022	U 0.024	U 0.022	U 0.021	U 0.023	U 0.022	U 0.022	U 0.024	U 0.022	U 0.025	U 0.023	U 0.023	U 0.023	U 0.026	U 0.022	U 0.023	U 0.024	U 0.024	U 0.024	U 0.023	U 0.027	U 0.024		
									/ Marka			_ ~ ~ / in in								Am 1							
Petroleum Compounds (NWTPH	and FPA Mot	hod 8260C)																									
Benzene			0.0045																								
	mg/kg		0.0045																								
Toluene	mg/kg																										
Ethylbenzene	mg/kg		0.082																								
m,p-Xylene	mg/kg		4.46																								
o-Xylene	mg/kg		0.082																								
Naphthalene	mg/kg		4.65																								
Diesel Range Organics	mg/kg		2000																								
Lube Oil Range Organics	mg/kg		2000																								
5 5 -	0 0																										

etroleum Compounds (NWTPH	and EPA Method 82	60C)									
Benzene	mg/kg	0.0045	 								
Toluene	mg/kg	0.052	 								
Ethylbenzene	mg/kg	0.082	 								
m,p-Xylene	mg/kg	4.46	 								
o-Xylene	mg/kg	0.082	 								
Naphthalene	mg/kg	4.65	 								
Diesel Range Organics	mg/kg	2000	 								
Lube Oil Range Organics	mg/kg	2000	 								

Notes:

Additional data discussion in the Remedial Investigation Report (PGG, 2014) * Total DDE, DDT, DDD based on Table 749-3 comments.

Table 3. Summary of Groundwater Monitoring Well Results

Sunnyside Municipal Airport, Sunnyside, Washington

Constituent	Units	Screening	SMW-1	SMW-1	SMW-1	SMW-1	SMW-1	SMW-1	SMW-2	SMW-2	SMW-2	SMW-2	SMW-2	SMW-2
		Level	3/31/2014	8/26/2015	4/12/2017	7/31/2017	10/30/2017	1/31/2018	3/31/2014	8/26/2015	4/12/2017	7/31/2017	10/30/2017	1/31/2018
Field Parameters														
Depth to Water	feet		10.56	10.32	9.28	9.48	9.57	9.81	10.95	10.56	9.65	9.66	9.91	10.16
Oxidation-Reduction Potential	mV		159	145			7.09	-86.1	130	159			7.15	-22.2
pH, Field	std.		7.74	7.46	7.2	7.17	1141	7.54	7.69	7.37	6.8	7.23	943	7.11
Specific Conductivity	umhos/cm		926	904		1114	18.7	1389	1005	1010		837	17.6	1092
Temperature	degrees C		14.3	20.07	13.4	18.9	4.36	15	14.9	18.23	13.9	18	2.34	15.2
Nitrate Results														
Nitrate as N	mg/L as N	10		39	100	120	110	120		28	54	41	47	64
Nitrite as N	mg/L as N	1		0.02U						0.02U				
Petroleum Compounds														
Benzene	ug/L	0.8	0.2U											
Diesel Range Organics	mg/L	0.5	0.26U											
Ethylbenzene	ug/L	6	0.2U											
Lube Oil	mg/L	0.5	U											
m,p-Xylene	ug/L	9	0.4U											
o-Xylene	ug/L	9	0.2U											
Toluene	ug/L	640	1U											
Organochlorine Pesticides														
4,4'-DDD	uq/L	0.365	0.043P	0.0048U	U 0.0047	0.0051UZ	0.0052 U	0.0048U	0.0047U	0.005U	0.04	0.019Z	0.045	0.028
4,4'-DDE	ug/L	0.257	0.058P	0.0048U	U 0.0047	0.0051UZ	0.13	0.0048U	0.03P	0.005U	0.034	0.005UZ	0.0052 U	0.0049U
4,4'-DDT	ug/L	0.257	0.034P	0.033	0.099	0.071PZ	0.1P	0.11	0.12P	0.08	0.061	0.022Z	0.0052 U	0.04
Aldrin	ug/L	0.003	0.01P	0.011	U 0.0047	0.051Z	0.0052 U	0.053P	0.0047U	0.02	U 0.0047	0.005UZ	0.0052 U	0.0049U
alpha-BHC	ug/L	0.014	0.018P	0.0048U	0.041	0.036Z	0.06	0.047	0.0047U	0.005U	0.0065	0.005UZ	0.0058P	0.0049U
alpha-Chlordane	ug/L	0.25	0.074P	0.023	U 0.0047	0.056PZ	0.09	0.14	0.0047U	0.005U	U 0.0047	0.0051PZ	0.0052 U	0.013P
beta-BHC	ug/L	0.049	0.005U	0.0048U	U 0.0047	0.0051UZ	0.0052 U	0.0048U	0.0047U	0.005U	U 0.0047	0.005UZ	0.0052 U	0.0049U
delta-BHC	ug/L	0.005	0.25	0.0048U	U 0.0047	0.11PZ	0.0052 U	0.0048U	0.0054P	0.005U	0.0094	0.07PZ	0.0052 U	0.0049U
Dieldrin	ug/L	0.005	0.26	0.042	0.077	0.025PZ	0.055P	0.074P	0.11P	0.005U	0.044	0.016PZ	0.041	0.034
Endosulfan I	ug/L	96	1.6	0.03	0.07	0.074Z	0.0052 U	0.067P	0.033P	0.005U	0.021	0.012PZ	0.0052 U	0.095P
Endosulfan II	ug/L	96	0.67	0.064	0.072	0.044Z	0.25	0.17P	0.085	0.019	0.031	0.017Z	0.053	0.036
Endosulfan Sulfate	ug/L	96	0.14	0.0071	U 0.0047	0.0051UZ	0.0052 U	0.0048U	0.0047U	0.026	U 0.0047	0.005UZ	0.0052 U	0.0049U
Endrin	ug/L	2	0.005U	0.0048U	0.03	0.058Z	0.06	0.061	0.0047U	0.005U	U 0.0047	0.005UZ	0.0052 U	0.0049U
Endrin Aldehyde	ug/L	2	0.099P	0.0048U	0.12	0.0051UZ	0.15P	0.0048U	0.033P	0.005U	U 0.0047	0.015PZ	0.0052 U	0.0049U
Endrin Ketone	ug/L	2	0.045P	0.019U	0.073	0.02UZ	0.021 U	0.019U	0.12P	0.17	0.11	0.097Z	0.17P	0.1P
gamma-BHC	ug/L	0.2	0.15P	0.0048U	U 0.0047	0.14PZ	0.21P	0.0048U	0.018P	0.005U	U 0.0047	0.013PZ	0.0052 U	0.025P
gamma-Chlordane	ug/L	0.25	0.039P	0.0048U	U 0.0047	0.0051UZ	0.0052 U	0.0048U	0.0047U	0.005U	U 0.0047	0.005UZ	0.0052 U	0.0049U
Heptachlor	ug/L	0.019	0.015	0.0067	U 0.0047	0.028PZ	0.0052 U	0.0048U	0.0047U	0.005U	U 0.0047	0.005UZ	0.0052 U	0.0049U
Heptachlor Epoxide	ug/L	0.005	0.005U	0.0048U	U 0.0047	0.0051UZ	0.0052 U	0.0048U	0.0047U	0.005U	U 0.0047	0.005UZ	0.0052 U	0.0049U
Methoxychlor	ug/L	40	0.01U	0.18	U 0.0094	0.01UZ	0.01 U	0.0095U	0.0094U	0.067	U 0.0093	0.051PZ	0.047P	0.0098U
Toxaphene	ug/L	0.08	22	0.048U	U 9.4	5.1UZ	10 U	4.8U	9.2	0.05U	U 7.5	2.5UZ	10 U	4.9U

Table 3. Summary of Groundwater Monitoring Well Results

Sunnyside Municipal Airport, Sunnyside, Washington

Constituent	Units	Screening Level	SMW-1 3/31/2014	SMW-1 8/26/2015	SMW-1 4/12/2017	SMW-1 7/31/2017	SMW-1 10/30/2017	SMW-1 1/31/2018	SMW-2 3/31/2014	SMW-2 8/26/2015	SMW-2 4/12/2017	SMW-2 7/31/2017	SMW-2 10/30/2017	SMW-2 1/31/2018
Organophosphorous Pesticides														
Azinphos-methyl	ug/L	0.5	0.52U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.48U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Bolstar (Sulprofos)	ug/L	0.2	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Chlorpyrifos	ug/L	48	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Coumaphos	ug/L	0.2	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Demeton-S	ug/L	0.64	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Diazinon	ug/L	0.2	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Dichlorvos (DDVP)	ug/L	0.151	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Dimethoate	ug/L	3.2	0.52U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.48U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Disulfoton (Di-Syston)	ug/L	0.64	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
EPN	ug/L	0.16	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Ethoprop	ug/L	0.2	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Fensulfothion	ug/L	0.5	0.52U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.48U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Fenthion	ug/L	0.2	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Malathion	ug/L	320	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Merphos	ug/L	0.5	0.52U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.48U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Methyl Parathion	ug/L	4	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Monocrotophos	ug/L	0.5	0.52U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.48U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Phorate	ug/L	3.2	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Sulfotepp	ug/L	8	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Tetrachlorvinphos (Gardona)	ug/L	3.65	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Tokuthion	ug/L	0.2	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Trichloronate	ug/L	0.2	0.21U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U
Chlorinated Herbicides														
2,4,5-T	ug/L	0.02	0.05U	0.1	U 0.069	0.069U	0.074 U	0.074U	0.046U	0.047U	U 0.071	0.069U	0.074 U	0.074U
2,4-D	ug/L	70	1.1P	0.3	U 0.091	0.091U	0.098 U	0.098U	0.046U	0.046U	U 0.094	0.092U	0.098 U	0.098U
2,4-DB	ug/L	128	0.074U	0.071U	U 0.069	0.069U	0.074 U	0.074U	0.07U	0.078	U 0.071	0.069U	0.074 U	0.074U
Dalapon	ug/L	200	0.24U	0.46U	U 0.45	0.44U	0.48 U	0.48U	0.22U	0.45U	U 0.46	0.45U	0.48 U	0.48U
Dicamba	ug/L	480	0.025U	0.047U	U 0.046	0.046U	0.049 U	0.049U	0.023U	0.046U	U 0.047	0.046U	0.049 U	0.049U
Dichlorprop	ug/L	0.025	0.049U	0.047U	U 0.046	0.046U	0.049 U	0.049U	0.046U	0.046U	U 0.047	0.046U	0.049 U	0.049U
Dinoseb	ug/L	7	0.37	0.14	0.43	0.23	0.3	0.36	1.6	0.21	460	48	180	32
MCPA	ug/L	8	7.4U	7U	28	6.8U	7.3 U	7.3U	6.9U	6.9U	U 7	6.8U	7.3 U	7.3U
MCPP	ug/L	16	4.9U	4.7U	U 6.8	6.8U	7.3 U	7.3U	4.6U	4.6U	U 7	6.8U	7.3 U	7.3U
Pentachlorophenol	ug/L	0.219	0.01U	0.0095U	U 0.0092	0.0092U	0.0099 U	0.0099U	0.0093U	0.0093U	U 0.0095	0.0093U	0.0099 U	0.0099U
Silvex	ug/L	50	0.05U	0.1	U 0.046	0.046U	0.15	0.14	0.047U	0.047U	U 0.048	0.046U	0.05 U	0.05U

Notes:

Bold indicates exceedance of the screening level

Additional direct push data are available in the Remedial Investigation report (PGG, 2014)

Table 3. Summary of Groundwater Monitoring

Sunnyside Municipal Airport, Sunnyside, Washington

Constituent	Units	Screening	SMW-3	SMW-3	SMW-3	SMW-3	SMW-3	SMW-3	SMW-4	SMW-4	SMW-4	SMW-4	SMW-4
		Level	3/31/2014	8/26/2015	4/12/2017	7/31/2017	10/30/2017	1/31/2018	12/23/2015	4/12/2017	7/31/2017	10/30/2017	1/31/2018
Field Parameters													
Depth to Water	feet		10.26	10.08	8.91	9.29	9.29	9.48	9.42	9.36	9.51	9.53	9.74
Oxidation-Reduction Potential	mV		185	135			7.07	-19.3	-20			7.45	-35.7
pH, Field	std.		7.5	7.33	6.8	7.18	1570	7.05	7.59	6.9	7.44	802	7.36
Specific Conductivity	umhos/cm		2580	2650		1529	17.3	2030	662.6		777	15.7	899.4
Temperature	degrees C		14.6	18.43	13.7	19	2.36	14.7	13.7	14.5	18.5	1.57	14.2
Nitrata Daguita													
Nitrate Results		10		400	400	450	470	CO	44		40	47	4
Nitrate as N	mg/L as N	10 1		190 0.65	160	150	170	60	11 0.086	20	13	17	1
Nitrite as N	mg/L as N	I		0.05					0.086				
Petroleum Compounds													
Benzene	ug/L	0.8	0.2U										
Diesel Range Organics	mg/L	0.5	0.67										
Ethylbenzene	ug/L	6	0.2U										
Lube Oil	mg/L	0.5	0.41U										
m,p-Xylene	ug/L	9	0.4U										
o-Xylene	ug/L	9	0.2U										
Toluene	ug/L	640	1U										
Organochlorine Pesticides													
4,4'-DDD	ug/L	0.365	0.04P	0.0049U	0.042	0.018PZ	0.028P	0.3P	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
4,4'-DDE	ug/L	0.257	0.074P	0.0049U	0.19	0.0048UZ	0.19P	0.0048U	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
4,4'-DDT	ug/L	0.257	0.042P	0.0049U	0.14	0.0048UZ	0.13P	0.0048U	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
Aldrin	ug/L	0.003	0.0048U	0.0049U	U 0.0047	0.0048UZ	0.08	0.053	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
alpha-BHC	ug/L	0.014	0.057	0.12	0.059	0.04Z	0.0053 U	0.0048U	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
alpha-Chlordane	ug/L	0.25	0.045P	0.032	U 0.0047	0.022PZ	0.069P	0.032P	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
beta-BHC	ug/L	0.049	0.0048U	0.0049U	U 0.0047	0.0048UZ	0.0053 U	0.0048U	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
delta-BHC	ug/L	0.005	0.0048U	0.0049U	0.029	0.0048UZ	0.0053 U	0.0048U	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
Dieldrin	ug/L	0.005	0.099P	0.13	0.17	0.13Z	0.26	0.15P	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
Endosulfan I	ug/L	96	0.0048U	0.0049U	0.11	0.076PZ	0.0053 U	0.064P	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
Endosulfan II	ug/L	96	0.14	0.083	0.12	0.0092PZ	0.47	0.27P	0.0048U	U 0.0047	0.0078	0.0053 U	0.0048U
Endosulfan Sulfate	ug/L	96	0.0048U	0.000	0.062	0.003212	0.15P	0.0048U	0.0048U	0.0053	0.0064	0.0053 U	0.0048U
Endrin	ug/L	2	0.0048U	0.0049U	0.069	0.039PZ	0.081P	0.087P	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
Endrin Aldehyde	ug/L ug/L	2	0.0048U	0.00490 0.0049U	0.069	0.039FZ 0.0048UZ	0.081P	0.007P	0.0048U	U 0.0047	0.00490 0.0049U	0.0053 U 0.0053 U	0.0048U
Endrin Ketone	ug/L	2	0.00480 0.019U	0.00490 0.02U	U 0.24	0.00480Z	0.021 U	0.00480 0.019U	0.00480 0.019U	U 0.019	0.00490 0.02U	0.021 U	0.00480 0.019U
damma-BHC	•	0.2	0.00190 0.0048U	0.020	U 0.0047	0.01902 0.11PZ	0.021 0 0.21P	0.0190	0.0190 0.0048U	U 0.0047	0.020	0.021 U	0.0190 0.0052P
gamma-BHC gamma-Chlordane	ug/L	0.2	0.00480 0.0048U	0.00490	U 0.0047	0.0048UZ	0.21P 0.0053 U	0.14P 0.0048U	0.00480 0.0048U	U 0.0047	0.00490	0.0053 U 0.0053 U	0.0052P 0.0048U
U U	ug/L												
Heptachlor	ug/L	0.019	0.0048U	0.19	U 0.0047	0.0048UZ	0.0053 U	0.0048U	0.0048U	U 0.0047	0.013P	0.0053 U	0.0048U
Heptachlor Epoxide	ug/L	0.005	0.0048U	0.0049U	U 0.047	0.0048UZ	0.0053 U	0.0048U	0.0048U	U 0.0047	0.0049U	0.0053 U	0.0048U
Methoxychlor	ug/L	40	0.0097U	0.15	U 0.0093	0.36Z	0.011 U	0.93P	0.0096U	U 0.0094	0.0099U	0.011 U	0.0096U
Toxaphene	ug/L	0.08	9.8	0.049U	U 19	4.8UZ	20 U	4.8U	0.048U	U 0.47	0.49U	0.53 U	0.048U

Table 3. Summary of Groundwater Monitoring

Sunnyside Municipal Airport, Sunnyside, Washington

Constituent	Units	Screening Level	SMW-3 3/31/2014	SMW-3 8/26/2015	SMW-3 4/12/2017	SMW-3 7/31/2017	SMW-3 10/30/2017	SMW-3 1/31/2018	SMW-4 12/23/2015	SMW-4 4/12/2017	SMW-4 7/31/2017	SMW-4 10/30/2017	SMW-4 1/31/2018
Organophosphorous Pesticides													
Azinphos-methyl	ug/L	0.5	0.47U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Bolstar (Sulprofos)	ug/L	0.2	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Chlorpyrifos	ug/L	48	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Coumaphos	ug/L	0.2	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Demeton-S	ug/L	0.64	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Diazinon	ug/L	0.2	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Dichlorvos (DDVP)	ug/L	0.151	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Dimethoate	ug/L	3.2	0.47U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Disulfoton (Di-Syston)	ug/L	0.64	1.5	3.56	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
EPN	ug/L	0.16	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Ethoprop	ug/L	0.2	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Fensulfothion	ug/L	0.5	0.47U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Fenthion	ug/L	0.2	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Malathion	ug/L	320	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Merphos	ug/L	0.5	0.47U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Methyl Parathion	ug/L	4	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Monocrotophos	ug/L	0.5	0.47U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Phorate	ug/L	3.2	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Sulfotepp	ug/L	8	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Tetrachlorvinphos (Gardona)	ug/L	3.65	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Tokuthion	ug/L	0.2	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Trichloronate	ug/L	0.2	0.19U	0.5U	U 0.2	0.2U	0.2 U	0.2U	0.087U	U 0.2	0.2U	0.2 U	0.2U
Chlorinated Herbicides													
2,4,5-T	ug/L	0.02	0.047U	0.15	U 0.071	0.073U	0.074 U	0.075U	0.046U	U 0.071	0.07U	0.074 U	0.075U
2,4-D	ug/L	70	1.4	0.23	U 0.094	0.096U	0.097 U	0.099U	0.045U	U 0.093	0.092U	0.097 U	0.1U
2,4-DB	ug/L	128	2.3P	2.1	U 0.071	0.073U	0.074 U	0.075U	0.069U	U 0.07	0.07U	0.074 U	0.075U
Dalapon	ug/L	200	0.23U	0.45U	U 0.46	0.47U	0.47 U	0.49U	0.44U	U 0.45	0.45U	0.48 U	0.49U
Dicamba	ug/L	480	0.33	1.2	0.22	0.73	0.15	0.061P	0.045U	0.33	0.36	0.28	0.17
Dichlorprop	ug/L	0.025	0.12P	0.047U	U 0.047	0.048U	0.049 U	0.05U	0.046U	U 0.047	0.046U	0.049 U	0.05U
Dinoseb	ug/L	7	210	340	19	87	12	7.8	3	21	6.8	9.2	8.2
MCPA	ug/L	8	20P	32	U 7	7.2U	7.3 U	7.4U	6.8U	U 7	6.9U	7.3 U	7.4U
MCPP	ug/L	16	130P	110	U 7	7.2U	7.3 U	7.4U	4.5U	U 7	6.9U	7.3 U	7.4U
Pentachlorophenol	ug/L	0.219	0.029P	0.0094U	U 0.0095	0.0097U	0.0098 U	0.01U	0.0092U	U 0.0094	0.0093U	0.0098 U	0.01U
Silvex	ug/L	50	0.088P	0.24	U 0.047	0.049U	0.14P	0.11P	0.046U	U 0.047	0.047U	0.049 U	0.05U

Notes:

Bold indicates exceedance of the screening level

Additional direct push data are available in the Remedial Investic

Table 4. Soil Organic Carbon-Water Partitioning Coefficients Sunnyside Municipal Airport, Sunnyside, Washington

Constituent	Koc (L/kg)
Chlorinated Herbicides	407
2,4,5-T	107
2,4,5-TP (Silvex) 2,4-D	175.3 29.63
2,4-D 2,4-DB	29.05
Dalapon	3.231
Dicamba	29.01
Dichlorprop	
Dinoseb	4294
MCPA	29.63
MCPP	48.51
Pentachlorophenol	592
Organochlorine Pesticides 4.4'-DDD	45900
4,4-DDD 4,4'-DDE	45800 86405
4,4'-DDL 4,4'-DDT	677934
Aldrin	48685
alpha-BHC	1762
alpha-Chlordane	67540
beta-BHC	2139
delta-BHC	2807
Dieldrin	25546
Endosulfan I	6761
Endosulfan II	6761
Endosulfan Sulfate	9847
Endrin	10811
Endrin Aldehyde	3271
Endrin Ketone	10811
gamma-BHC	1352
gamma-Chlordane Heptachlor	67540 9528
Heptachlor Epoxide	83200
Methoxychlor	80000
Toxaphene	95816
Organophosphorous Pesticides	
Azinphos-methyl	51.93
Bolstar (Sulprofos)	
Chlorpyrifos	7283
Coumaphos	
Demeton-S	
Diazinon	3034
Dichlorvos (DDVP)	53.96
Dimethoate Disulfoton (Di-Syston)	12.77 837.9
EPN	15470
Ethoprop	
Fensulfothion	
Fenthion	
Malathion	31.27
Merphos	48970
Methyl Parathion	729.3
Monocrotophos	
Phorate	459.8
Sulfotepp	265.6
Tetrachlorvinphos (Gardona)	1375
Tokuthion Trichloronate	
Inorganics	
Nitrate as N	
Petroleum Compounds	
Benzene	62
Diesel Range Organics	
Ethylbenzene	204
Lube Oil	
m,p-Xylene	196 ; 311
o-Xylene	241
Toluene	140
Notes:	

Notes:

Table 5. Summary of Remedial Alternatives

Sunnyside Municipal Airport Pesticide Spray Shed, Sunnyside, Washington

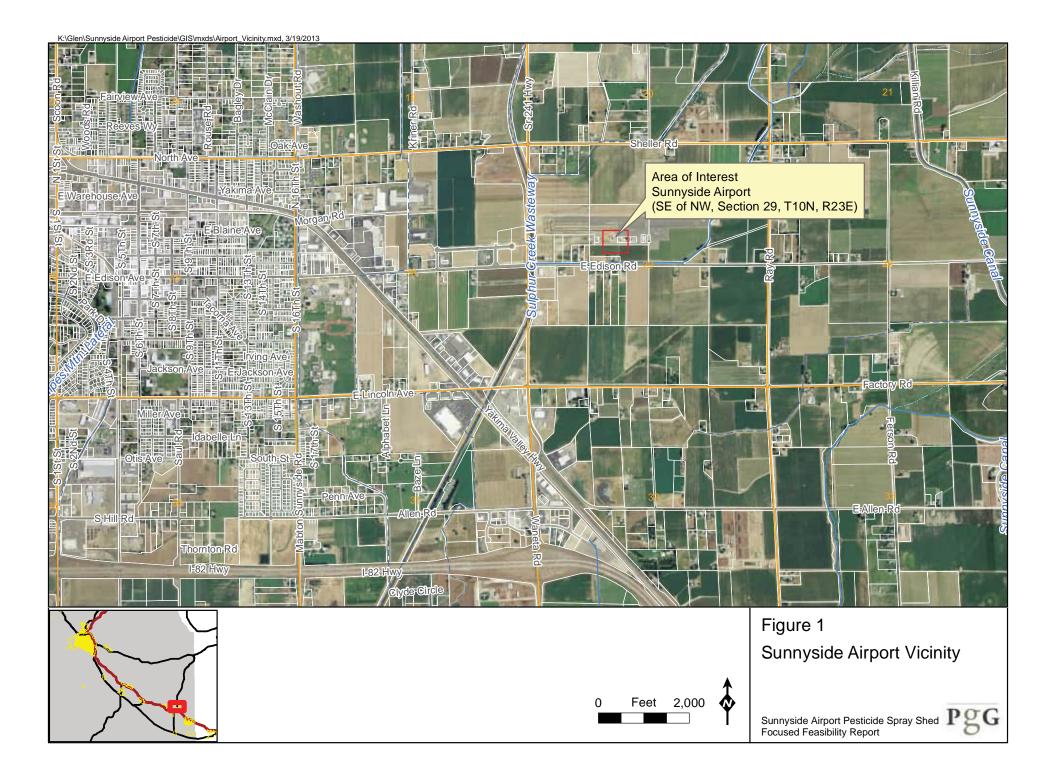
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	Excavation with Groundwater Treatment	Targeted Excavation with Groundwater Treatment	Containment with Groundwater Monitoring	Containment with Groundwater nZVI Treatment	Targeted Excavation with Groundwater Monitoring
	Figure 4	Figure 5	Figure 6	Figure 7	Figure 8
Remedial Alternative Components	 Excavation of soils Groundwater enhanced bioremediation Institutional controls for soils beneath existing structures 	Targeted excavation of soils Groundwater enhanced bioremediation Institutional controls for soils beneath existing structures	 Minimum excavation Engineered containment layer Institutional controls for site Compliance Monitoring and Conditional Point of Compliance 	 Minimum excavation Asphalt containment layer Zero-Valent Iron (ZVI) Injections Institutional controls for soil and groundwater 	 Targeted excavation of soils Engineered containment layer Institutional controls for soils beneath existing structures
Remedial Action by Media					
Soil	 Excavation Institutional controls 	- Targeted excavation - Institutional controls	- 1ft excavation - Asphalt containment layer - Institutional controls	 - 1ft excavation - Asphalt containment layer - Institutional controls 	 Targeted excavation Asphalt containment layer Institutional controls
Groundwater	 Enhanced biodegradation Institutional controls 60 years groundwater monitoring 	 Enhanced biodegradation Institutional controls 60 years groundwater monitoring 	 Asphalt containment layer (recharge prevention) Institutional controls 90 years groundwater monitoring 	 Asphalt containment layer (recharge prevention) ZVI groundwater control Institutional controls 60 years groundwater monitoring 	 Asphalt containment layer (recharge prevention) Institutional controls 90 years groundwater monitoring
Remedial Alternative Costs	\$ 1,847,000	\$ 1,337,000	\$ 674,000	\$ 1,217,000	\$ 1,324,000

 Table 6. Disproportionate Cost Analysis

 Sunnyside Municipal Airport Remedial Investigation, Sunnyside, Washington

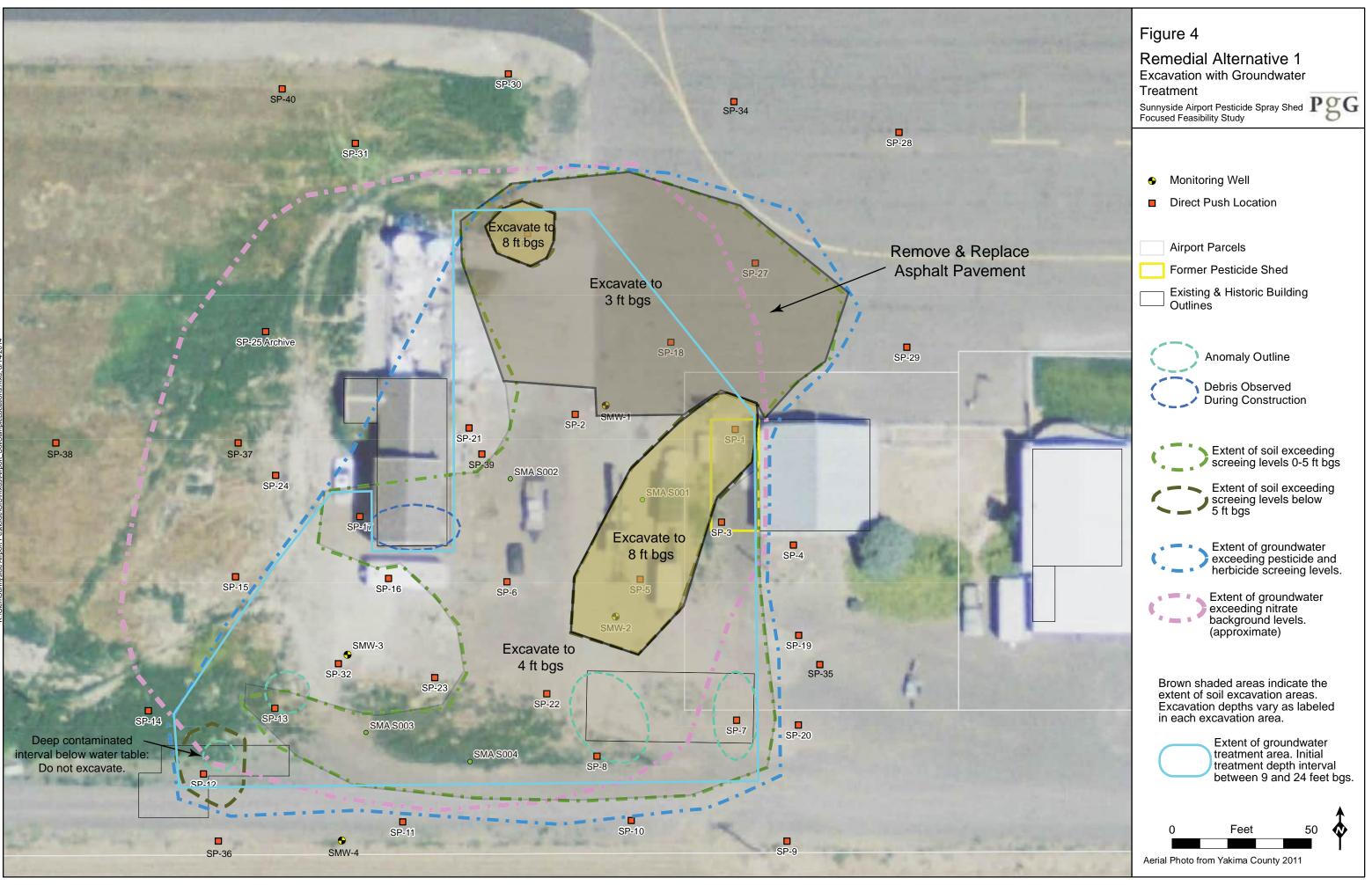
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	
	Excavation with Groundwater Treatment	Targeted Excavation with Groundwater Treatment	Containment with Groundwater Monitoring	Containment with Groundwater nZVI Treatment	Targeted Excavation with Groundwater Monitoring	
enefits Ranking for Disproportionate	Cost Analysis (Score 1-10)					
Criteria		1	Scores and Estimations:			
Overall Protectiveness	8	8	6	8	8	
Permanence	8	7	6	7	7	
Long Term Effectiveness	8	8	6	8	8	
Management of Short Term Risk	5	6	8	8	6	
Implementability	7	7	8	7	7	
Consideration of Public Concerns	9	9	9	9	9	
Overall Benefit Score	45	45	43	47	45	
Averaged Benefit Score	7.5	7.5	7.2	7.8	7.5	
isproportionate Cost Analysis						
Estimated Remedy Cost	\$1,847,000	\$1,337,000	\$674,000	\$1,217,000	\$1,324,000	
Relative Cost/Benefit Ratio (divided by 10,000)	4.1	3.0	1.6	2.6	2.9	
Estimated Time	60	60	90	60	90	

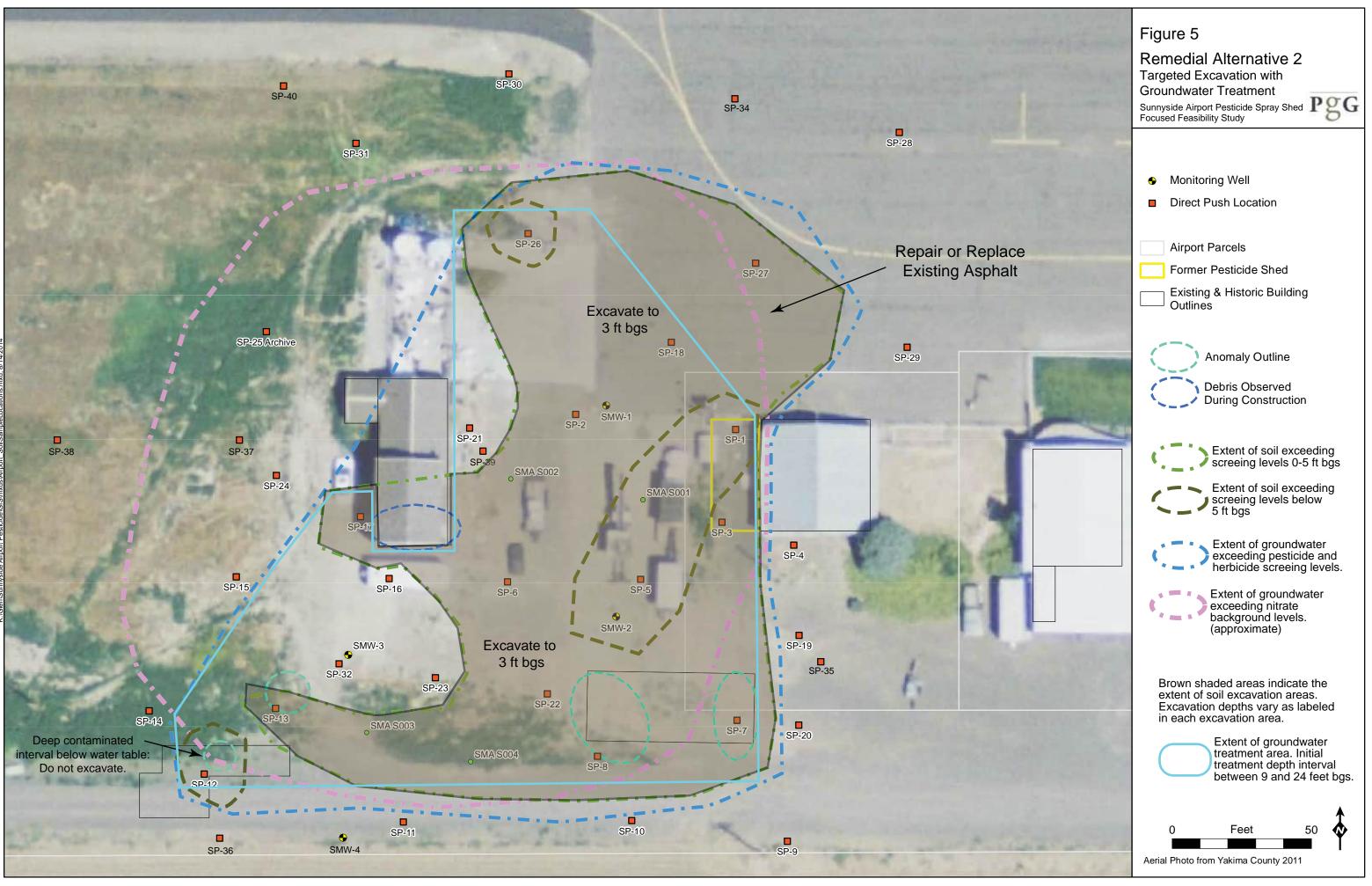
Notes:

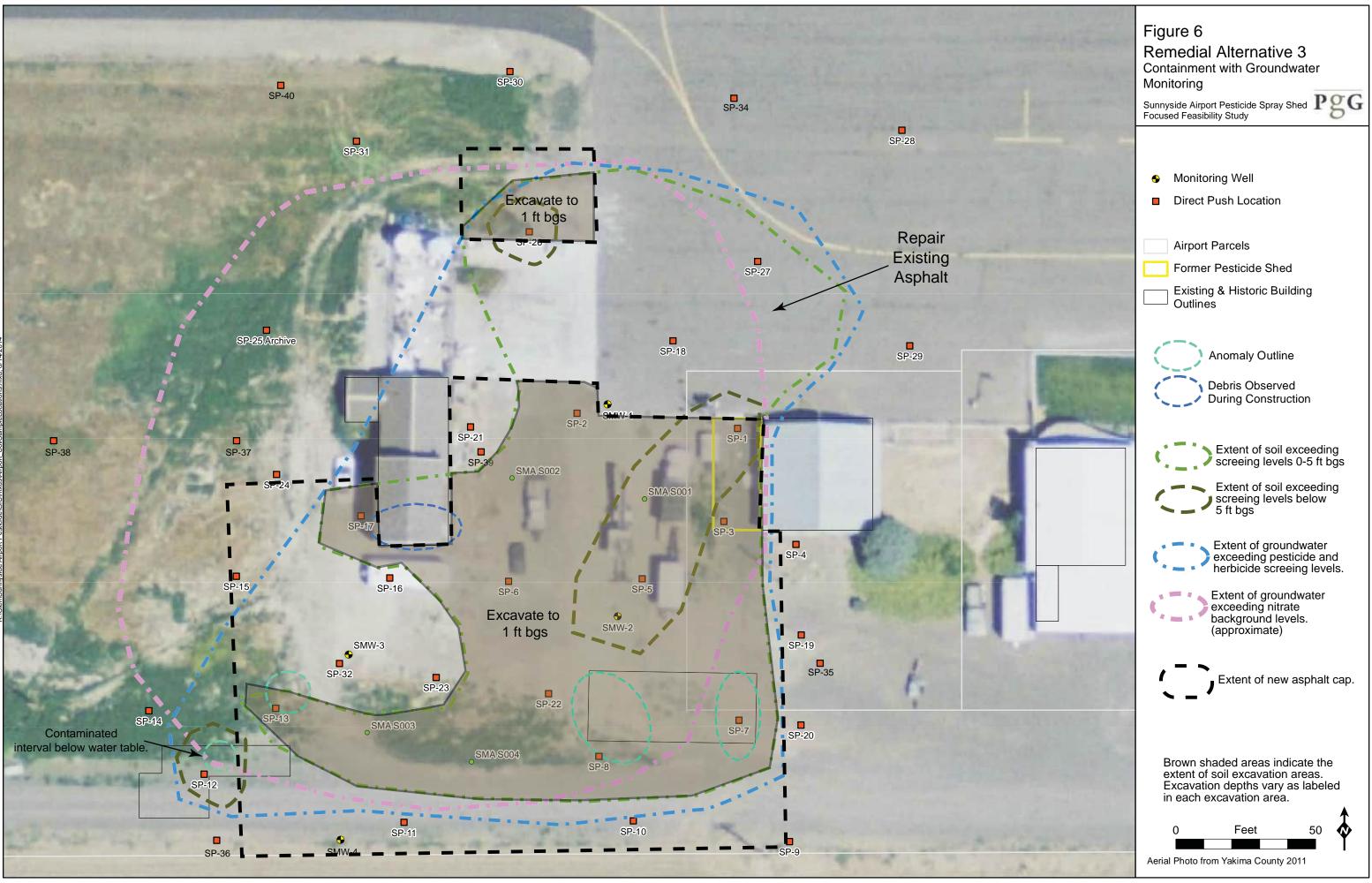


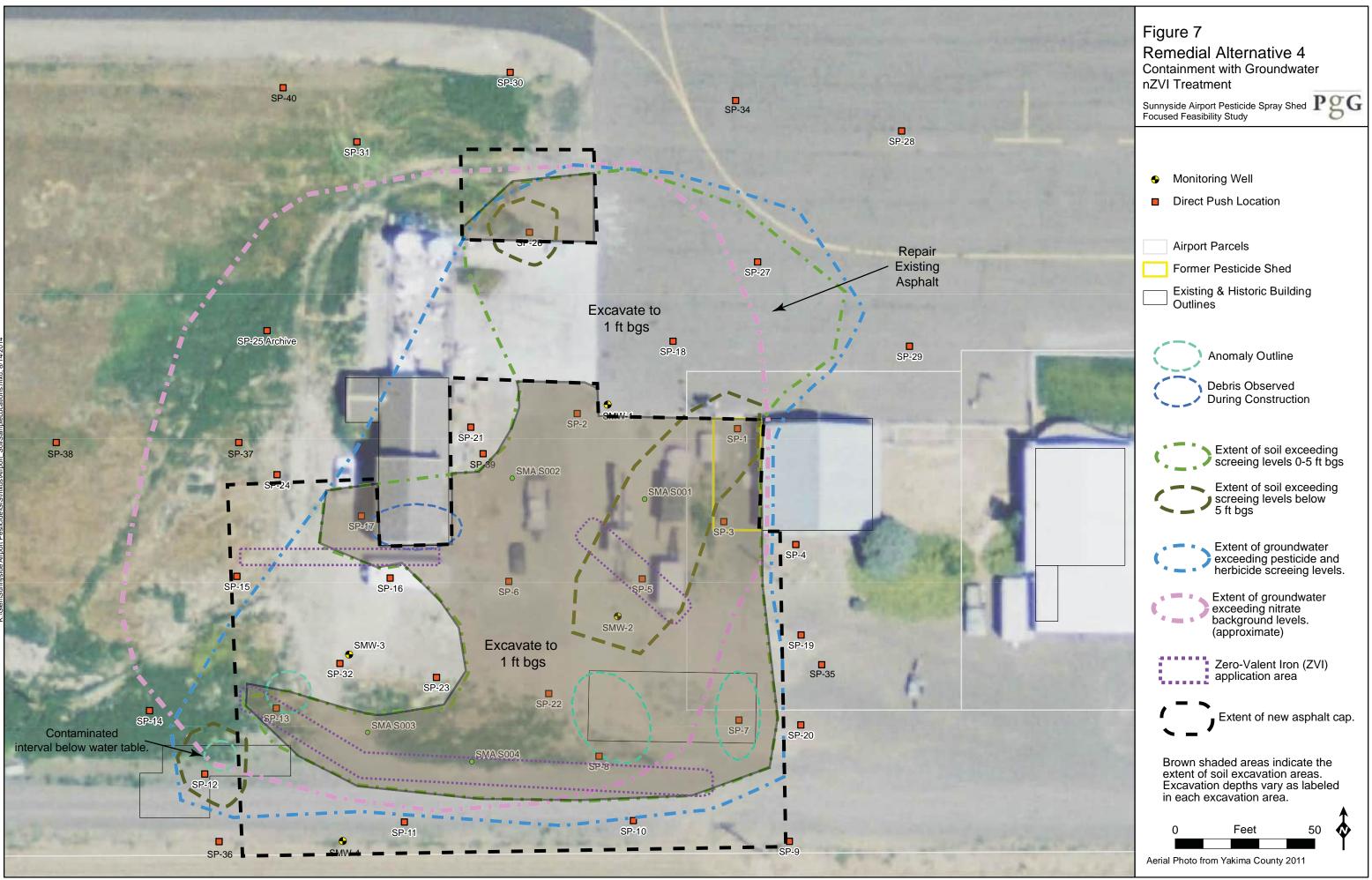












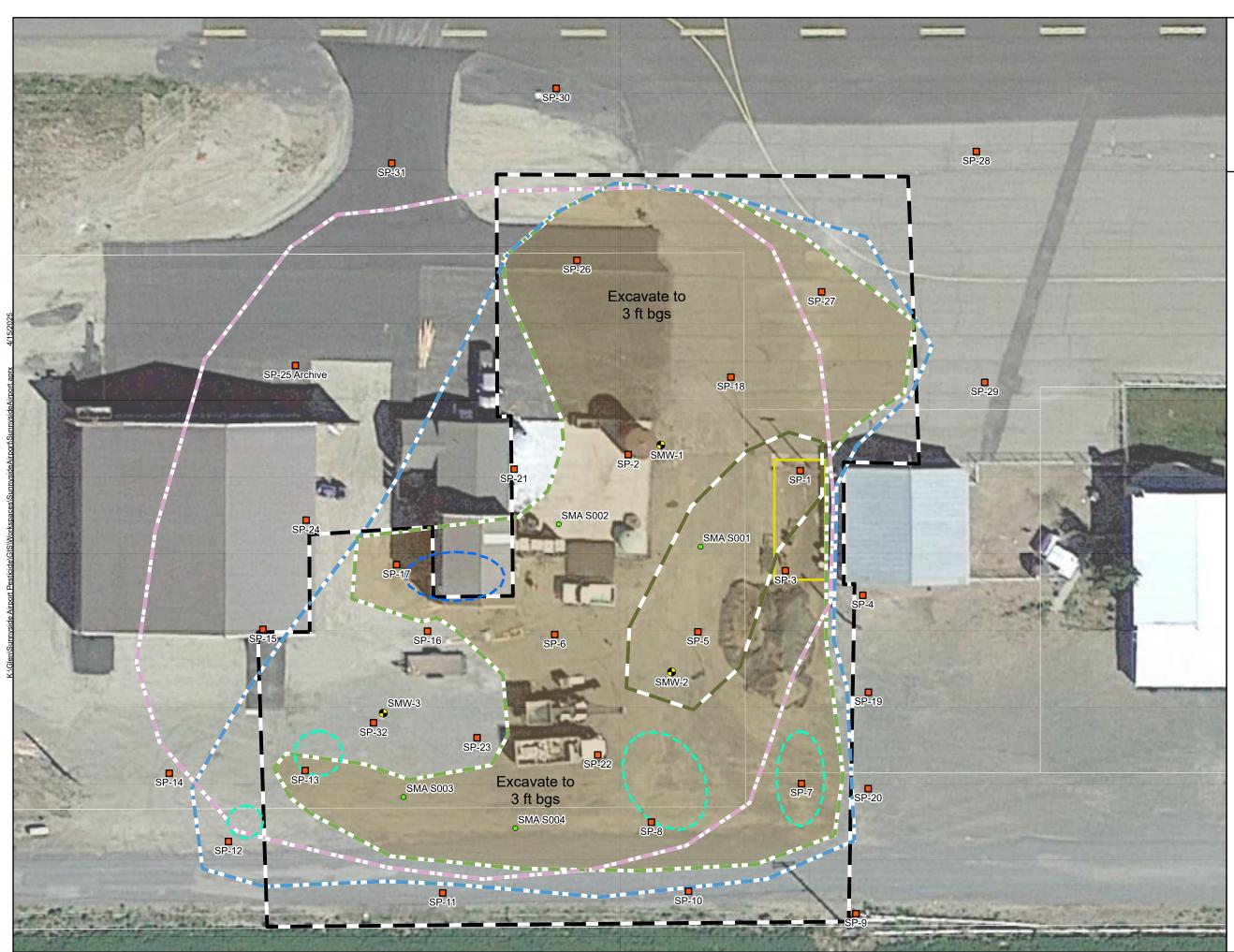


Figure 8 Remedial Alternative 5 Targeted Excavation with Groundwater Monitoring

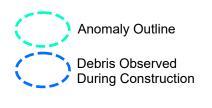
Sunnyside Airport Pesticide Spray Shed Focused Feasibility Study

M MOTT MACDONALD

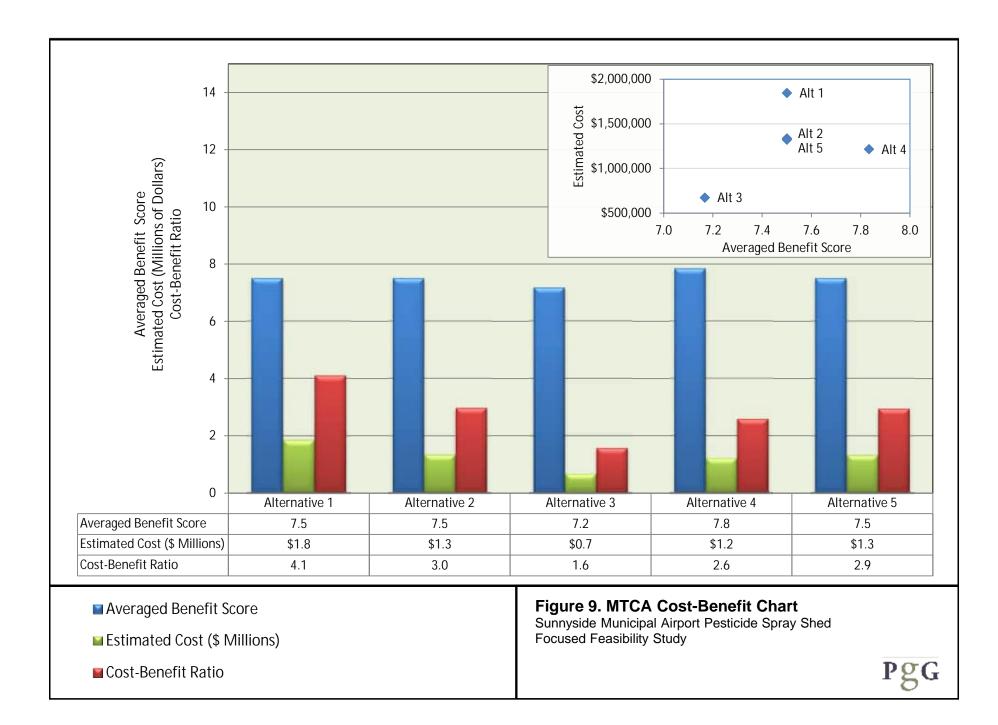
- Monitoring Well
- Direct Push Location
- Ecology Sample Locations
- Former Pesticide Shed
- Extent of groundwater exceeding nitrate background levels. (approximate)
- Extent of groundwater exceeding pesticide and herbicide screening
- levels.
- Extent of soil exceeding screening
 levels 0-5 ft bgs
- Extent of soil exceeding screening levels below 5 ft bgs
- Extent of new asphalt cap.

Туре

Extent of soil excavation area







Appendix A. Cost Estimates

Table A1. Alternative 1- Excavation with Groundwater Treatment

Sunnyside Municipal Airport Pesticide Spray Shed, Sunnyside, Washington

Reporting Description	Unit	Value	Notes
Engineering Design Report / Bid Specs	lump	\$20,000 \$40,000	Design documents
Compliance Monitoring Plan	lump	\$10,000	Describes Groundwater Monitoring Plan
Remedial Action Report	lump	\$20,000	Documentation of remedial action
Groundwater Monitoring Reports	lump		Included in Groundwater monitoring, below
Total Reporting Costs		\$50,000	
Excavation			
escription	Unit	Value	Notes
xcavation Quantities			
Shallow Area 1	sqft	17,650	Unpaved Area
Shallow Depth 1	feet	4	
•	leet		Deved Area
Shallow Area 2		8,950	Paved Area
Shallow Depth 2		3	
Shallow Excavation Volume	су	3,609	
Deep Area 1	sqft	3,164	Adjacent and below former shed
Deep Depth 1 (below Shallow depth interval)	feet	5	If shallow is 4 feet and deep is 5 ft, total depth is 9 ft bgs
Deep Area 2	sqft	400	NW corner of pavement
Deep Depth (below Shallow depth interval)	feet	6	If shallow is 3 feet and deep is 5 ft, total depth is 9 ft bgs
Deep Excavation Volume	су	586	
Aggregate Excavation Volume	•	4,195	Shallow and Deep Volumes
	Cy tops/ov/		Granow and Deep volumes
Cubic Yards to Tonnage Conversion Factor	tons/cy	1.5	
Aggregate Excavation Tonnage	tons	6,293	
Haz Waste Percentage	%	25%	Percentage to be refined based on TCLP results and profiling
Non-Hazardous Waste Percentage	%	75%	
Haz Waste Tonnage	tons	1,573	Disposal at Subtitle C landfill
Non-Hazardous Waste Tonnage	tons	4,720	Disposal at Subtitle D landfill
Excavation Costs			
Excavate and Load	\$/ton	\$10	Nominal Rate; includes contractor site control, dust control, standb
Transport to Landfill (either Subtitle D or C)	\$/ton	\$28.75	Cost per ton to transport; see also load flat rate cost, below)
Tons per load	tons/load	12	estimated tons per truck load
Per load Transport cost (flat rate)	\$/load	\$465	
Pro-rated Transport Fee (based on flat-rate)	\$/ton	\$38.75	
Disposal Fees- Non-Hazardous Waste	\$/ton	\$22	Subtitle D landfill: Columbia Ridge
Disposal Fees- Hazardous Waste	\$/ton	\$75.63	Subtitle C landfill: Chemical Waste Management
Aggregate Subtitle D per ton cost	\$/ton	\$99	Subtitle D landfill: Columbia Ridge
Aggregate Subtitle D Disposal	\$	\$469,410	
Aggregate Subtitle C per ton cost	\$/ton	\$153	Subtitle C landfill: Chemical Waste Management
Aggregate Subtitle C Disposal	\$	\$240,900	
Backfill Procure and Place Backfill	\$/cy	\$25	Cost to procure and place clean backfill; no geotechnical stabilizati
Backfill Cost	\$	\$104,880	
Utility Disconnect/Reconnect	\$	\$10,000	Cost to handle electrical and water utilities in excavation area
Total Soil Excavation & Disposal Cost	\$	\$825,190	
Disposal and Confirmation Characterization Costs			
Profile Review Fee		\$750	At disposal landfill; \$75 per profile; assume 10 profiles.
Confirmation Sampling Rate	cy/sample	¢730 24	1 sample per two truck loads at 12 cy/load
Number of Confirmation Samples	cyrsample		
•	 ()	175 #200	To be confirmed with disposal location
Confirmation Sample Cost Analytical costs	\$/sample	\$300 \$53,190	
		ψ55,150	
Excavation Observation Costs	م مور ا	¢00.000	Accumac 2 weeks on eite with office surrent
Geologist On Site	lump	\$23,300	Assumes 3 weeks on site with office support
Groundwater			
escription	Unit	Value	Notes
Ionitoring Well Install and Remove			
Ionitoring Well Install and Remove Decommission Existing Wells	lump	\$1,500	Chip in place by licensed driller
Ionitoring Well Install and Remove Decommission Existing Wells Install Replacement Wells (4)	lump lump	\$24,000	Chip in place by licensed driller Wells for long term monitoring
Ionitoring Well Install and Remove Decommission Existing Wells	-		
Ionitoring Well Install and Remove Decommission Existing Wells Install Replacement Wells (4) Total Well Costs	-	\$24,000	
Monitoring Well Install and Remove Decommission Existing Wells Install Replacement Wells (4) Total Well Costs Groundwater Treatment Cost	lump	\$24,000 \$25,500	Wells for long term monitoring
Monitoring Well Install and Remove Decommission Existing Wells Install Replacement Wells (4) Total Well Costs Groundwater Treatment Cost Average Treatment cost per unit volume	lump \$/event	\$24,000 \$25,500 \$116,558	Wells for long term monitoring Based on Regenesis quote pro-rated to 26,000 sqft area
Nonitoring Well Install and Remove Decommission Existing Wells Install Replacement Wells (4) Total Well Costs Groundwater Treatment Cost Average Treatment cost per unit volume Treatment Events	lump \$/event #	\$24,000 \$25,500 \$116,558 3	Wells for long term monitoring
Aonitoring Well Install and Remove Decommission Existing Wells Install Replacement Wells (4) Total Well Costs Groundwater Treatment Cost Average Treatment cost per unit volume Treatment Events Aggregate Groundwater Treatment Cost	lump \$/event	\$24,000 \$25,500 \$116,558	Wells for long term monitoring Based on Regenesis quote pro-rated to 26,000 sqft area
Ionitoring Well Install and Remove Decommission Existing Wells Install Replacement Wells (4) Total Well Costs Froundwater Treatment Cost Average Treatment cost per unit volume Treatment Events	lump \$/event #	\$24,000 \$25,500 \$116,558 3	Wells for long term monitoring Based on Regenesis quote pro-rated to 26,000 sqft area

Institutional Controls

Description	Unit	Value	Notes
Institutional Controls			
Draft and File Environmental Covenant	Lump	\$5,000	
Amend Lease Language	Lump	\$1,000	Does not include chagne in lease rate or other possible costs
Sum of Institutional Controls		\$6,000	

Description	Unit	Value	Notes
Sum of Direct Expenses	\$	\$1,477,892	
Contingency	%	25%	
Contingency Amount	\$	\$369,473	
Total Estimated Alternative Cost	¢	\$1,847,000	Rounded to nearest thousand dollars

Notes:



Table A2. Alternative 2- Targeted Excavation with Groundwater Treatment

Sunnyside Municipal Airport Pesticide Spray Shed, Sunnyside, Washington

Engineering Design Report / Bid Specs lump \$15,000 Design documents Compliance Monitoring Plan lump \$20,000 Documentation of remedial action Remedial Action Report lump \$20,000 Documentation of remedial action Groundwater Monitoring Reports lump	Reporting Description	Unit	Value	Notes
Compliance Monitoring Plan Remedial Action Report Lump \$5.000 Describes Groundwater Monitoring Plan Included in Groundwater Monitoring Plan Securities Station Report Lump \$20.000 Describes Groundwater Monitoring Plan Included in Groundwater monitoring, balow Station Variation Reports Lump \$40.000 Station Variation Included in Groundwater Monitoring Plan Included in Groundwater Monitoring, balow Station Variation Included in Groundwater Monitoring Plan Station Variation Station Variation Included in Groundwater Monitoring, balow Station Variation Included in Groundwater Monitoring Plan Station Variation Station Variation Included in Groundwater Monitoring Plan Station Variation Station Variation Included in Groundwater Monitoring Plan Agregate Station Station Variation Included in Groundwater Monitoring Plan Agregate Station Station Variation Station </td <td></td> <td></td> <td></td> <td>Design documents</td>				Design documents
Remetal Action Reprint Lump \$20,000 Decumentation of remedial action ¹ / ¹ Total Reporting Costs Jump Included in Groundwater monitoring, below Station Variants Station Station Excavation Included in Groundwater monitoring, below Shallow Area aptrophon Feet 3 Shallow Excavation Volume cy 3,056 Cubic Yards to Toonage Conversion Factor tons / 4,383 How Yards to Toonage Conversion Factor tons / 4,383 Percentage to be refined based on TCLP results and profiling Non-Hazardow Yase Percentage % 25% Hex Waste Percentage % 25% Percentage to be refined based on TCLP results and profiling Non-Hazardow Waste Toonage tons / 4,383 Hex Waste Percentage % 25% Disposal at Subtite D Londfill tons / 4,383 Non-Hazardow Waste Toonage tons / 4,384 Station / 4,384 tons / 4,384 tons / 4,384 Excavate and Load \$100 \$100 Station / 2,387 Cast per ton transport, see also Load / 1,184 tons / 1,184 Disposal Fees - Non-Hazardow Waste / 4,197 \$100 \$2,873 Subtite D andfill: Columbia				
Groundwater Monitoring Reports Lump Included in Groundwater monitoring, below Straiter Costs Straiter Costs Excaration Unit Value Notes Straiter Costs Straiter Costs Straiter Costs Could Variet Scawation Volume cy 3.056 Aggregate Excavation Volume cy 3.056 Cubit Variet Tornange fors 4.583 Non-Hazardous Wasts Fornange fors 3.438 Disposal at Subtite C landfill Non-Hazardous Wasts Fornange fors Straiter Costs Straiter Costs Straiter Costs Exemands Costs Straiter Costs Straiter Costs Exemands Costs Straiter Cost Straiter Costs Perioad Transport Cost (Later table) Straiter Costs Straiter Costs Perioad Transport Cost (Later table) Straiter Cost Straiter Costs Aggregate Subtite D Defors Costs Straiter Costs Straiter Costs Aggregate Subtite D Defors Costs Straiter Costs Straiter Costs Aggregate Subtite D Defor Costs Straiter Costs Straite		•		
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Institutional Controls Description Unit Value Notes Institutional Controls Draft and File Environmental Covenant Lump \$5,000				
Description Unit Value Notes Institutional Controls Draft and File Environmental Covenant Lump \$5,000	60 Years Groundwater Monitoring		\$145,039	NPV Adjusted, see Table A6 for details
Institutional Controls Draft and File Environmental Covenant Lump \$5,000				
Draft and File Environmental Covenant Lump \$5,000		Unit	Value	NOTES
		1		
Amena Lease Language Lump \$1,000				
Sum of Institutional Controls \$6,000		Lump		

Description	Unit	Value	Notes
Sum of Direct Expenses	\$	\$1,069,331	
Contingency	%	25%	
Contingency Amount	\$	\$267,333	

Notes:



Table A3. Alternative 3: Containment with Groundwater Monitoring Sunnyside Municipal Airport Pesticide Spray Shed, Sunnyside, Washington

Remediation Costs			
Reporting	Unit	Value	Notos
Description Engineering Design Report / Bid Specs	lump	\$15,000	Notes Design documents
Compliance Monitoring Plan	lump	\$5,000	Describes Groundwater Monitoring Plan
Remedial Action Report	lump	\$20,000	Documentation of remedial action
Groundwater Monitoring Reports	lump	φ20,000 	Included in Groundwater monitoring, below
Total Reporting Costs	ump	\$40,000	included in Groundwater monitoring, below
Excavation			
Description	Unit	Value	Notes
Excavation Quantities			
Shallow Area	sqft	20,000	Contaminated soil within paved area
Shallow Depth	feet	1	
Shallow Excavation Volume	су	741	
Aggregate Excavation Volume	су	741	
Cubic Yards to Tonnage Conversion Factor	tons/cy	1.5	
Aggregate Excavation Tonnage	tons	1,111	
Haz Waste Percentage	%	75%	Percentage to be refined based on TCLP results and profiling
Non-Hazardous Waste Percentage	%	25%	
Haz Waste Tonnage	tons	833	Disposal at Subtitle C landfill
Non-Hazardous Waste Tonnage	tons	278	Disposal at Subtitle D landfill
Excavation Costs			
Excavate and Load	\$/ton	\$10	Nominal Rate; includes contractor site control, dust control, standb
Transport to Landfill (either Subtitle D or C)	\$/ton	\$28.75	Cost per ton to transport; see also load flat rate cost, below)
Tons per load	tons/load	12	estimated tons per truck load
Per load Transport cost (flat rate)	\$/load	\$70	Total estimated number of truck trips
Pro-rated Transport Fee (based on flat-rate)	\$/ton	\$5.83	
Disposal Fees- Non-Hazardous Waste	\$/ton	\$22	Subtitle D landfill: Columbia Ridge
Disposal Fees- Hazardous Waste	\$/ton	\$75.63	Subtitle C landfill: Chemical Waste Management
Aggregate Subtitle D per ton cost	\$/ton	\$67	Subtitle D landfill: Columbia Ridge
Aggregate Subtitle D Disposal	\$	\$18,484	
Aggregate Subtitle C per ton cost Aggregate Subtitle C Disposal	\$/ton \$	\$120 \$100,176	Subtitle C landfill: Chemical Waste Management
	• (• • •	• • • • • • • • • • • • • • • • • • •
Backfill Procure and Place Backfill	\$/cy	\$25	Cost to procure and place clean backfill; no geotechnical stabilizati
Backfill Cost	\$	\$18,519	
Total Soil Excavation & Disposal Cost	\$	\$137,179	
Disposal and Confirmation Characterization Costs			
Profile Review Fee		\$750	At Landfill; \$75 per profile
Confirmation Sampling Rate	cy/sample	24	1 sample per two truck loads at 12 cy/load
Number of Confirmation Samples		31	To be confirmed with disposal location
Confirmation Sample Cost	\$/sample	\$300	
Analytical costs		\$10,009	
Excavation Observation Costs			
Geologist On Site	lump	\$21,800	Assumes 3 weeks on site with office support
	lump	φ21,000	Assumes a weeks on site with once support
Containment Physical Elements			
Description	Unit	Value	Notes
Containment Physical Elements	of	20 500	Soo options on Figure 2.2. Extends haven a conteminated and
Pavement Area	sf ¢/cf	28,500 \$4.50	See extent on Figure 3-3. Extends beyond contaminated area
Asphalt Install Rate	\$/sf		Rate assuming 4 inch cover
Asphalt Install Cost	\$	\$128,250	
Geotextile Barrier below clean fill	\$/sf	\$0.80	
Geotextile Area	sf	76	
Geotextile Area Cost	\$	\$61 \$5 000	
Patch Aircraft Tarmac Cracks Sum of Containment Elements	lump	\$5,000 \$133,311	
		<i><i><i>w</i></i>¹⁰⁰,011</i>	
Asphalt Maintenance	Total	¢ 40 674	NDV/ adjusted value over 00 vegre
Maintenance Elements	Total	\$49,671	NPV adjusted value over 90 years.
Groundwater Monitoring			
Description	Unit	Value	Notes
Monitoring Well Install and Remove		#0 0 000	
Install additional wells (2)	lump	\$20,000	Assume 2 additional wells.
Total Well Costs		\$20,000	
Long Term Groundwater Monitoring			
90 years groundwater monitoring	ref	\$156,129	Includes NPV adjustment; se Table A6 for details
oo yearo groundwater monitoning	101	ψ130,129	monuces in a automnetil, se table AU IUI delalis
Institutional Controls			
Description	Unit	Value	Notes

Description	Unit	Value	Notes
Institutional Controls			
Draft and File Environmental Covenant	Lump	\$10,000	
Amend Lease Language	Lump	\$1,000	Does not include possible adjustment to lease rate.
Sum of Institutional Controls		\$11,000	

Description	Unit	Value	Notes
Sum of Direct Expenses	\$	\$539,099	
Contingency Rate	%	25%	
Contingency Amount	\$	\$134,775	
Total Estimated Alternative Cost	\$	\$674.000	Rounded to nearest thousand dollars

Notes:



Table A4. Alternative 4: Containment with Groundwater nZVI Treatment Sunnyside Municipal Airport Pesticide Spray Shed, Sunnyside, Washington

Reporting			
Description	Unit	Value	Notes
Engineering Design Report / Bid Specs	lump	\$15,000	Design documents
Compliance Monitoring Plan	lump	\$5,000	Describes Groundwater Monitoring Plan
Remedial Action Report	lump	\$20,000	Documentation of remedial action
Groundwater Monitoring Reports	lump		Included in Groundwater monitoring, below
Total Reporting Costs		\$40,000	
Excavation			
Description	Unit	Value	Notes
Excavation Quantities			
Shallow Area	sqft	20,000	Contaminated soil within paved area
Shallow Depth	feet	1	
Shallow Excavation Volume	су	741	
Aggregate Excavation Volume	су	741	
Cubic Yards to Tonnage Conversion Factor	tons/cy	1.5	
Aggregate Excavation Tonnage	tons	1,111	
Haz Waste Percentage	%	75%	Percentage to be refined based on TCLP results and profiling
Non-Hazardous Waste Percentage	%	25%	
Haz Waste Tonnage	tons	833	Disposal at Subtitle C landfill
Non-Hazardous Waste Tonnage	tons	278	Disposal at Subtitle D landfill
Excavation Costs			
Excavate and Load	\$/ton	\$10	Nominal Rate; includes contractor site control, dust control, standb
	\$/ton		Cost per ton to transport; see also load flat rate cost, below)
Transport to Landfill (either Subtitle D or C)	•	\$28.75	
Tons per load	tons/load	12	estimated tons per truck load
Per load Transport cost (flat rate)	\$/load	\$70 \$5.92	Total estimated number of truck trips
Pro-rated Transport Fee (based on flat-rate)	\$/ton	\$5.83	Out-Mile Diles diffic Online Lin Dill
Disposal Fees- Non-Hazardous Waste	\$/ton	\$22	Subtitle D landfill: Columbia Ridge
Disposal Fees- Hazardous Waste	\$/ton	\$75.63	Subtitle C landfill: Chemical Waste Management
Aggregate Subtitle D per ton cost	\$/ton	\$67	Subtitle D landfill: Columbia Ridge
Aggregate Subtitle D Disposal	\$	\$18,484	U U U U U U U U U U U U U U U U U U U
Aggregate Subtitle C per ton cost	\$/ton	\$120	Subtitle C landfill: Chemical Waste Management
Aggregate Subtitle C Disposal	\$	\$100,176	v
Pool/fill Drogure and Discs Dest	¢/~	* 05	Cost to produce and place 0 inches class hard-tottle
Backfill Procure and Place Backfill Backfill Cost	\$/cy \$	\$25 \$13,889	Cost to procure and place 8 inches clean backfill;
Total Soil Excavation & Disposal Cost	э \$	\$132,549	no geotechnical stabilization incl.
	·	,	
Disposal and Confirmation Characterization Costs		6 0	
Profile Review Fee	, .	\$750	At Landfill; \$75 per profile
Confirmation Sampling Rate	cy/sample	24	1 sample per two truck loads at 12 cy/load
Number of Confirmation Samples		31	To be confirmed with disposal location
Confirmation Sample Cost	\$/sample	\$300	
Analytical costs		\$10,009	
Excavation Observation Costs			
Geologist On Site	lump	\$21,800	Assumes 3 weeks on site with office support
Containment Physical Elements Description	Unit	Value	Notes
Containment Physical Elements			
Pavement Area	sf	28,500	See extent on Figure 7. Extends beyond contaminated area
Asphalt Install Rate	\$/sf	\$4.50	Install 4-inch asphalt surface
Asphalt Install Cost	\$	\$128,250	
Geotextile Barrier below clean fill	\$/sf	\$0.80	
Geotextile Area	sf	76	
Geotextile Area Cost	\$	\$61	
Patch Aircraft Tarmac Cracks	lump	\$10,000	Existing large cracks in airport parking area
Sum of Containment Elements		\$138,311	
Apphalt Maintanance			
Asphalt Maintenance Inspection and Maintenance	Total	\$49,671	90 year NPV-adjusted estimate
	10101	φ τ σ,071	
Groundwater Treatment			
Description	Unit	Value	Notes
Zero Valent Iron Bench Testing	J	#0.000	Assume spring methods by direct such
Collect Samples	lump	\$6,000 \$15,000	Assume coring methods by direct push.
Analytical and Reporting	lump	\$15,000 \$21,000	Test with multiple types ZVI, and analytical, letter report
Total Well Costs			
Total Well Costs		. ,	
Zero Valent Iron Implementation			
Zero Valent Iron Implementation Final dosing design	lump	\$2,500	See Note 1. Years 1-30
Zero Valent Iron Implementation Final dosing design Drilling/Injection	lump	\$2,500 \$27,000	15 days at \$1800/day (assumes 3 locations/day)
Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials	lump \$/lb	\$2,500 \$27,000 \$20	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005)
Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials Dosing Rate	lump	\$2,500 \$27,000 \$20 12.08	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005) Target is 0.4% by mass
Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials	lump \$/lb	\$2,500 \$27,000 \$20	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005)
Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials Dosing Rate	lump \$/lb lbs ZVI/cy	\$2,500 \$27,000 \$20 12.08	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005) Target is 0.4% by mass
Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials Dosing Rate Volume Material Cost	lump \$/lb lbs ZVI/cy cy	\$2,500 \$27,000 \$20 12.08 1778	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005) Target is 0.4% by mass Approximately 10 by 350 by 10 ft volume as barrier
Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials Dosing Rate Volume Material Cost Observation and Technical Support	lump \$/lb lbs ZVI/cy cy \$	\$2,500 \$27,000 \$20 12.08 1778 \$429,511	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005) Target is 0.4% by mass Approximately 10 by 350 by 10 ft volume as barrier Estimated cost assuming 12 lbs ZVI per cy
Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials Dosing Rate Volume Material Cost	lump \$/lb lbs ZVI/cy cy	\$2,500 \$27,000 \$20 12.08 1778	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005) Target is 0.4% by mass Approximately 10 by 350 by 10 ft volume as barrier
Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials Dosing Rate Volume Material Cost Observation and Technical Support	lump \$/lb lbs ZVI/cy cy \$	\$2,500 \$27,000 \$20 12.08 1778 \$429,511	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005) Target is 0.4% by mass Approximately 10 by 350 by 10 ft volume as barrier Estimated cost assuming 12 lbs ZVI per cy
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Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials Dosing Rate Volume Material Cost Observation and Technical Support Geologist observation & support Implementation Cost Groundwater Monitoring Description Monitoring Well Install and Remove Install additional wells (2)	lump \$/lb Ibs ZVI/cy cy \$ Iump \$	\$2,500 \$27,000 \$20 12.08 1778 \$429,511 \$5,000 \$450,511 Value \$20,000	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005) Target is 0.4% by mass Approximately 10 by 350 by 10 ft volume as barrier Estimated cost assuming 12 lbs ZVI per cy Assumes 2 trips to site and other support by phone Not adjusted for inflation or net present value
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Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials Dosing Rate Volume Material Cost Deservation and Technical Support Geologist observation & support Implementation Cost Groundwater Monitoring Description Monitoring Well Install and Remove Install additional wells (2) Total Well Costs	lump \$/lb Ibs ZVI/cy cy \$ Iump \$ Unit	\$2,500 \$27,000 \$20 12.08 1778 \$429,511 \$5,000 \$450,511 Value \$20,000	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005) Target is 0.4% by mass Approximately 10 by 350 by 10 ft volume as barrier Estimated cost assuming 12 lbs ZVI per cy Assumes 2 trips to site and other support by phone Not adjusted for inflation or net present value Notes
Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials Dosing Rate Volume Material Cost Dbservation and Technical Support Geologist observation & support Implementation Cost Groundwater Monitoring Description Monitoring Well Install and Remove Install additional wells (2) Total Well Costs Long Term Groundwater Monitoring	lump \$/lb Ibs ZVI/cy cy \$ Iump \$ Unit	\$2,500 \$27,000 \$20 12.08 1778 \$429,511 \$5,000 \$450,511 Value \$20,000 \$20,000	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005) Target is 0.4% by mass Approximately 10 by 350 by 10 ft volume as barrier Estimated cost assuming 12 lbs ZVI per cy Assumes 2 trips to site and other support by phone Not adjusted for inflation or net present value Notes Assume 2 sand and gravel aquifer wells screened 35 to 45 feet
Zero Valent Iron Implementation Final dosing design Drilling/Injection Injection Materials Dosing Rate Volume Material Cost Observation and Technical Support Geologist observation & support Implementation Cost Groundwater Monitoring Description Monitoring Well Install and Remove Install additional wells (2)	lump \$/lb Ibs ZVI/cy cy \$ lump \$ <u>Unit</u> lump	\$2,500 \$27,000 \$20 12.08 1778 \$429,511 \$5,000 \$450,511 Value \$20,000	15 days at \$1800/day (assumes 3 locations/day) Nominal cost per pound based on Gavaskar et al. (2005) Target is 0.4% by mass Approximately 10 by 350 by 10 ft volume as barrier Estimated cost assuming 12 lbs ZVI per cy Assumes 2 trips to site and other support by phone Not adjusted for inflation or net present value Notes

escription	Unit	Value	Notes
nstitutional Controls			
Draft and File Environmental Covenant	Lump	\$5,000	
Amend Lease Language	Lump	\$1,000	Does not include possible adjustment to lease rate.
Sum of Institutional Controls		\$6,000	
Description	Unit	Value	Notes
Description Sum of Direct Expenses	Unit \$	Value \$973,890	Notes
			Notes
Sum of Direct Expenses	\$	\$973,890	Notes
Sum of Direct Expenses Contingency Rate	\$	\$973,890 25%	Notes



Table A5. Alternative 5: Targeted Excavation with Containment Sunnyside Municipal Airport Pesticide Spray Shed, Sunnyside, Washington

Remediation Costs Reporting			
Description	Unit	Value	Notes
Engineering Design Report / Bid Specs	lump	\$15,000	Design documents
Compliance Monitoring Plan	lump	\$5,000	Describes Groundwater Monitoring Plan
Remedial Action Report	lump	\$20,000	Documentation of remedial action
Groundwater Monitoring Reports	lump	φ20,000	Included in Groundwater monitoring, below
Total Reporting Costs	lump	\$40,000	included in Croundwatch monitoring, below
		φ+0,000	
Excavation			
Description xcavation Quantities	Unit	Value	Notes
Shallow Area	sqft	27,500	
Shallow Depth	feet	27,500	
Shallow Excavation Volume	cy	3,056	
Aggregate Excavation Volume		3,056	
Cubic Yards to Tonnage Conversion Factor	cy tons/cy	1.5	
Aggregate Excavation Tonnage	tons	4,583	
			Dereentage to be refined based on TCLD results and profiling
Haz Waste Percentage	%	25%	Percentage to be refined based on TCLP results and profiling
Non-Hazardous Waste Percentage	%	75%	
Haz Waste Tonnage	tons	1,146	Disposal at Subtitle C landfill
Non-Hazardous Waste Tonnage	tons	3,438	Disposal at Subtitle D landfill
xcavation Costs			
Excavate and Load	\$/ton	\$10	Nominal Rate; includes contractor site control, dust control, standby
Transport to Landfill (either Subtitle D or C)	\$/ton	\$28.75	Cost per ton to transport; see also load flat rate cost, below)
Tons per load	tons/load	12	estimated tons per truck load
Per load Transport cost (flat rate)	\$/load	\$70	Total estimated number of truck trips
Pro-rated Transport Fee (based on flat-rate)	\$/ton	\$5.83	
Disposal Fees- Non-Hazardous Waste	\$/ton	\$22	Subtitle D landfill: Columbia Ridge
Disposal Fees- Hazardous Waste	\$/ton	\$75.63	Subtitle C landfill: Chemical Waste Management
•			
Aggregate Subtitle D per ton cost	\$/ton	\$67	Subtitle D landfill: Columbia Ridge
Aggregate Subtitle D Disposal	\$	\$228,743	
Aggregate Subtitle C per ton cost	\$/ton	\$120	Subtitle C landfill: Chemical Waste Management
Aggregate Subtitle C Disposal	\$	\$137,742	
Backfill Procure and Place Backfill	\$/cy	\$25	Cost to procure and place clean backfill; no geotechnical stabilization
Backfill Cost	\$	\$76,389	
Utility Disconnect/Reconnect	\$	\$10,000	Cost to handle electrical and water utilities in excavation area
Total Soil Excavation & Disposal Cost	\$	\$452,874	
isposal and Confirmation Characterization Costs			
Profile Review Fee		ሮፖርብ	At disposal landfill; \$75 per profile; assume 10 profiles.
		\$750	
Confirmation Sampling Rate	cy/sample	24	1 sample per two truck loads at 12 cy/load
Number of Confirmation Samples	 ¢/	127	To be confirmed with disposal location
Confirmation Sample Cost	\$/sample	\$300	
Analytical costs		\$38,944	
xcavation Observation Costs			
Geologist On Site	lump	\$20,300	Assumes 3 weeks on site with office support
ontainment Physical Elements			
escription	Unit	Value	Notes
ontainment Physical Elements			
Soil Stabilization Mobilization Costs	lump	\$40,000	Assumed cost for mobilization and contractor PM expenses
Pavement/Amendment Area	sf	40,444	See extent on Figure 3-3. Extends beyond contaminated area
Amendment Depth	ft	1	
Amendment Volume	су	1,498	
Amendment Rate	%	5.0%	Assumed rate to be confirmed by geotechnical engineer
Amendment Quantity	tons	127.3	at 1.7 tons/cy
-	\$/ton	\$130	
Amendment Unit Cost		\$16,552	
Amendment Unit Cost Amendment Cost	\$		
Amendment Cost		\$15	
Amendment Cost Amendment Application Cost	\$/sy	\$15	
Amendment Cost			
Amendment Cost Amendment Application Cost Amendment Application Cost	\$/sy \$	\$15 \$67,407 \$123,959	
Amendment Cost Amendment Application Cost Amendment Application Cost Asphalt Install Rate	\$/sy \$ \$/sf	\$15 \$67,407 \$123,959 \$3.50	Rate assuming 2 inch cover
Amendment Cost Amendment Application Cost Amendment Application Cost Asphalt Install Rate Asphalt Install Cost	\$/sy \$	\$15 \$67,407 \$123,959 \$3.50 \$141,554	Rate assuming 2 inch cover
Amendment Cost Amendment Application Cost Amendment Application Cost Asphalt Install Rate Asphalt Install Cost Patch Aircraft Tarmac Cracks	\$/sy \$ \$/sf	\$15 \$67,407 \$123,959 \$3.50	Rate assuming 2 inch cover
Amendment Cost Amendment Application Cost Amendment Application Cost Asphalt Install Rate Asphalt Install Cost	\$/sy \$ \$/sf \$	\$15 \$67,407 \$123,959 \$3.50 \$141,554	Rate assuming 2 inch cover
Amendment Cost Amendment Application Cost Amendment Application Cost Asphalt Install Rate Asphalt Install Cost Patch Aircraft Tarmac Cracks	\$/sy \$ \$/sf \$	\$15 \$67,407 \$123,959 \$3.50 \$141,554 \$5,000	Rate assuming 2 inch cover

Groundwater Monitoring

Description	Unit	Value	Notes
Monitoring Well Install and Remove			
Install additional wells (2)	lump	\$20,000	Assume 2 additional wells.
Total Well Costs		\$20,000	
Long Term Groundwater Monitoring			
90 years groundwater monitoring	ref	\$156,129	Includes NPV adjustment; see Table A6 for details
Institutional Controls			
Description	Unit	Value	Notes
Institutional Controls			
Draft and File Environmental Covenant	Lump	\$10,000	
Amend Lease Language	Lump	\$1,000	Does not include possible adjustment to lease rate.
Sum of Institutional Controls		\$11,000	
Description	Unit	Value	Notes
Sum of Direct Expenses	\$	\$1,059,431	
Contingency Rate	%	25%	
Contingency Amount	\$	\$264,858	
Total Estimated Alternative Cost	\$	\$1,324,000	Rounded to nearest thousand dollars

Notes:



Appendix B. Supplemental Materials

Data Summary

This appendix summarizes data collected during the Remedial Investigation with comparison to revised screening levels, and expanded discussion of reporting limits, detection frequency, and exceedance of screening levels. This section also responds to select Ecology comments on the draft Focused Feasibility Study (FFS) that were not appropriate to discuss in the main FFS text (Ecology, 2017; PGG, 2015).

Revised Screening Levels

Screening levels were revised to practical quantitation limits (PQLs) for constituents where the Applicable or Relevant and Appropriate Requirement (ARAR) based level was below the PQL. These values were then used to update exceedances in summary tables. ARAR values were not adjusted. Revised screening level tables are attached.

Laboratory data reports include sample-specific reporting limits. Reporting limits vary between samples based on matrix interferences and analytical configuration; labs periodically update their PQLs based on analysis of standards and control samples to reflect actual ongoing results. The laboratory reporting limit varied both above and below the PQL used to assign screening levels. In some cases, reporting limits were above the standard laboratory PQL and also above screening levels.

Field Logs

Field logs for borings almost exclusively log sandy silt in the upper silt unit. Therefore, boring logs were not produced for each field location during the Remedial Investigation (PGG, 2014). Boring logs and well construction diagrams were prepared for monitoring wells and included in the RI. Field logs for borings and subsequent sampling are included as supplemental materials to this FFS.

References

Ecology, 2017. *Ecology Comments on DRAFT Feasibility Study for Sunnyside Municipal Airport Pesticide Spray Shed*. January 20, 2017.

Pacific Groundwater Group, 2014. *Sunnyside Municipal Airport Pesticide Spray Shed Remedial Investigation*. Prepared for the City of Sunnyside. December 8, 2014.

Date // Shee Boring Location: Boring o* PACIFIC globalicawater GROUP 2577 ENERGY AVELE BUILS 201 Sear 1. West rater 99109 208 S28.0140 HAX 208 S28.8888 PgG Job 56/221 Job Se Logged by 65 V Westher 69 Drillion by/verbod 161 Sompling Wathod REVARKS: Drill oction, sample procedures, Size % SUMMARY Woler Content Samplo Sample Recovery fendroticn fesisfance 7 water conditions, heave, soil variations. Ğ \$; Depth 100 Color Rich Ronge 1-24.65 OFALLEL. b 0 . ., . Bour Deepts Morst VELLSRidg SILT. 1 1 2 Т 5 3 -Som Darph Break y. F. C. S. 4. [0] $\leq h_{c} \gamma_{c}$ I 6 -6 I 7 7 İ ı. 8 8 BoH 9 9 -1 I 0 0 1 Ι 2 2 3 3 4 73 S 5 -----5 SP-1-10-1540 5 _ · · ·i 8 -8 ġ c i Ο. ο.

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Baring_____Doje ____ 0° Baring: Location: PACLEDS 910 CTV RWR TOT CROUP 2877 Exe 244 748 5 8,177 977 Skim (1988) TOT CROC2 3 Skim (1988) TOT CROC2 3 Skim (1990) F CCL3 220 ART 105 No 3 6-19 11 Job S States pgG .ogges of TE Westher _ Cal. or ed by/Warnod 🔊 🖻 🚧 Sem REMARKS: Drill doffon, somete procedures. Size % SUMMARY Rowsharten Kasslarte Somple Recovery Water Content Sempla Number water conditions, neave, sol variations. 109 S G. 7 Depthy Color work Songe dry, the silly, five soundy, GRAVEL 0 --4.14 702010 ģ. ¥. 24 Dame light brown (time sandy, STLT SI LT 12+²* 35 65 2 2 3 τ 36 500 + browny silty, fine SAND 8 X Fine 36 20 SAND ¢ 304 С 2 Ξ 5p-11-18-5 @ 14:23 and 24" 4 5P-11-40-5@14:30 8014 5 --6 R 8 Q ġ.

Z G Shoot e f Care Baring Loostland Boring FOLDER WATCH AROUT $2 \times 1 \times 10^{-1}$ Jon No. 561801 Pgg Job Sara 19 2577 Costiñ - Avelie, el 1622). Sinte a costina e electronomia Logged by TIS Weather Ed I 17 Ad like zoolaza osob Dri. ed. by/wethod Sampling Method REVARKS: DH dotion, sample procedures. SUMMARY Sample Recovery Pershallan Revolution water conditions, neave, soll variations. Semola Number Water Conton LCG Gj S Depth-5 ĉ wiczy, Romga −-કાર્ણ Grog 14 Fine sandy silty, GRAVEL 25:30 ÷\$. Dallage 14 Lyourn Dame, It brown, Fine Sandy (SILT -SILT 45 55 do mill - couble broken (light discolard commothering? X 2 3 -5 faint wolldong (teopde) 5 SAND 75 25 SELT hamp, It brunn, Fine simil sandy, SEC 4060 8 drill rods at 11 bes wet light brow total The sandyr Science 36 25 SILT yesticium clos and sheen at - 200 248011 10', small down to 2 1441/124A) lo-steh natural 165314-1 X puch 3 3 mastill brown, the sandy SILT 25 75 <u>ت (</u> sandy, SILT 6 6 40 60 parpell brown, fine sandy, stilt 311 70 BOH 70 ⁽ 58-12-230-5 12.00 and 2301-240 58-12-18-512 12:00 and 1801-240 :મ**મુ-**ગ @11.4S SP-12-122-5@:1 NH0 / SP 324 38 ÷., 50-12-12-52 124 1.75 A 40. 18

Spring____ Dote- 144 Stev _ of Boring Loodfion: BACKTON BOOMEN UNDER DES MARCONDUM 1957 - Essen March Anna Es Sulor 2010 Sonamos Massing on Almona 2033/225 - 401 - AAA 200 323 5555 100 Sound 9 50 Jos No. TURUI PgG Logged by ME Westrer Coid SP-13 Orlind by Melroc ESM Somping Method I REVARKS' Drill detion, sample procedures, L SUMMARY Size % Jumple Recovery Ametrol on Resistance water conditions, neave, soll variations. Sempla Number Weher Content LOG G<u>, S</u> F Coplin Calor Vex. Serge (₂⁻ Û. متعا يتصبحان Dry to damp It brown Silly GROWEL "Damp: It brown i for sandy SILT . SELT ŝ 40.60 X 2 Ζ i 3 -Ζ. drilling harder after a 5.3" 5 damy to moist. It brown, slightly fine sauch SILT 70 6 -done to must it's brown, sciently sitty, fine SAND SAND Lev. O. + F SILT & 25 surphismost, It brown, Everyondy SELT 30 77 I markey BLT 2 BOW. 9 q 0 3 5P-13-18-5@ 14:55 and 18" SP-13-40-5@15:00 Fr_ 1.5 6 S. 8 9 q C -9,5 -

Bering_ __ Dute 2/5/18-ser __ of Boring Loostion: PARLER ADMITTED ALTOR GROUP TATE BASING AVAILE SUM 201 1941 M. Washington STIC2 STEIS2811 ATMINAVIZED STRIBBRE Job Strang side . ins No. Hallad pgg 1 Lagged of The Weather Call | Orilled by/Method Sections Verned = REWARKS: Orill dation, sample procedure 251 water conditions, heave, sei variations. REWARKS: Drill detron, sample procedures. SUMMARY Size Sample Number Songla Recovery Water Content 106 5' F Depth G Color 1 Host, Rosce Û 2.2 Sim Erne e re an Dang. It brown , fore sardy, STLT 30 7-0 1 Х 2 2 3 3. 4 5 5. Fore the source sitte fore sand 6 SAND 6 --**75** 25 Tret. If brown slight elayers, Fire soudy, STUTY SILT 75 25 wer, light brown, fine- med sandy, SILT & 45 55 vit 8 Bolt 9 g 0 0 1 2 3 SP-14-18-5 @ 15:25 and 18" 5 5 SP-14-405@ 15:30 and 72 E 8 3 0 -

Star _ of . _ Dare of Bering Location: Baring_<u> </u> _____ JOO NO. 56122 nt ACHELAU (1990), THOMHLER FIGRADUS 2811 - Fattisze ALA, FILS AS 2011 Register Musif interne 28101 2019 - Statistica - Prix 2018, F12, S260 2019 - Statistica - Prix 2018, F12, S260 Job <u>Strang</u>si<u>en</u>e pgG Carl Logged by The Weather . Drilles by/Melnod 🔜 🚣 🖅 : Someling Method _____ REMARKS: Drill action, sample propedures. SUMPARY 51za % Semple Recovery Fertients water conditions, neave, sell variations. bor bor Water Content LOG G: S' Dopth Capr / nr./ NCX Ronge 0 STLT artilicht browny, fine sandy, SELT 20000 Bang light brang tice sandy SELT 2 3 - 1 4 5 -45 ļ browny slightly five SANdy 5 8 - 11 Ы N SELT 7 ----8 BH G 9 0. ł 1 1 1 5p-15-5-18.@ 15:45 mil 18" 2 2 5P-15-5-40-@ 15:50 and 72 3 र 4 6 5 æ 8 9 0 $\sim -$

Bering Location: Dafe , Boring groundwater skowe Les Sungesh Job 40, 561201 Logged by Recther Cold 215 Dr8 earloy/Method $\mathbb{ES} \mathcal{U}_{i}$ Sompling Method L REMARKS: Drill defion, sample procedures. SUMMARY Sample Recovery Water Content GS water conditions, heave, split variations. Depth Calor 10G Wax. Borge Dary, bour, U.F. sanly SILT SILT DE 50. 3 -Darysta North US Staly 515 õ <u>9</u> ...! ; O - - When the were vite sonly st 5 / SAX . 15 ----SP-10-12-5 1608 З Sugar 10:51020.5 3-16-18-5 1600 5r-16-40-5 1605 72 - -- OS Refuse wi20.5Ft by a -> for is like Back.



Project Nutrol	ber			Date 2/5	114		
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Project Addre	ess			Sampled By	twh		
Ollent Namo:							
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Casing Diam	ete:. 1	2"4	·'6'		Other _		
Dominia de 161es	ter (føet):			Phroe Velu	me Measyreme:	n Merhon Is.	when
	l (fest): <u>(6</u>			Date Piliper	d: 215/14		
	oint (surveyors notch	e pho Y the			(from/ta)		
•	mpieo	<u> </u>			Probe Used	15-12-	
	······································						
1	Purge Volume Cal	culation:	(π*)(7.48 g	∣a /ft²)(3 casi: orosito, cities /	ng volumes)		
	Purge Volume (ga	ons) for 2 = (0	(1)(h); 41 = (1)	AP)(b) P. ± ((4,41) (1) Aostrol II, san Ma	lump (golles)	
	Calculated Purger				Rotoal Hurge Vo	iume (galioni	5)
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TIME	CUMULATIVE	p≻	FC	COLOR	TURBIDITY	ODOR	CTHER
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12:37	20.25	7.24	676	Le.	11	60	63/6.1
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Purging Equi	prest perista	alte_		Sart ping E:	quipment, 👷	ristattic	
		-					
Laboratory:	Dusite			Date Sent to	: Lap:		
Chain-of-Cus	tody (yes/no): 🦂	¥ 5			.mple Nomberr_		
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Project Number: <u>2 & 1251</u> Project Name: <u>5 wrong 61de</u> Project Address: Client Name			Sampled By Rurged By:			
Casing Diameter: 🤺 💷 🗹	2'	40 7	6'	Other		
Depth to Water (feet): Depth of Weil (feet): Reference Point (surveyors not: Day/inme Sampled:			Date Purge Purge Time	me Measuren d (from/to) I Probe Used:	<u> </u>	
Purge Volume Gr Purge Volume (g Celouiatod Purge	aliens; for 21 =	(0.49)(n) ⁺ 4" =	(1.96) (h) 6' = (4.41) (h)	Volume (gallens);_	
TIME COMULATIVE (2400 fc) VOLUME (gal) 	pH (units) 7.69 7.90	EC (umros/am 28 <u>831</u> 7360	5 a) (Visual) -	(visual)	1	-07-E97 11.5
Laboratory: <u>Division Lie</u> Chain-of-Custody (yes/no)	zud Fig		Field CC Sa	Lad: mpie Number		
Purging Equipment <u>Pervise</u> Laboratory: <u>Diwsit Le</u> Chain-of-Custody (yes/no) Shipment Methodr Well Integrity: Cuantity: Contained: Cuantity: Sto Arce Sto Arce	Preservatives Mont HeL HeL	Theres (ty	Date Sent to Field CC Sa Split with (ha	Lac:		

Page_____ot____ PgG

Well # SP-12 Sample #

Date 2/6/14 Project Number: <u>J Gr</u> 17.0<u>1</u> Project Name: <u>Sunnaside posticiel</u> Location: Sampled By GSW FTWH Project Address1 Client Name _____ Purged Sys ______ 11 Casing Diameter Other Purge Volume Measurement Method; Depth to Water (feet):____ Depth of Weil (feet):____ _ Oate Puiged ______ Purge Time (from/to); Reference Point (surveyors noton, etc.)/_____ Water Level Probe Used: Day/1.me Sampled Purge Volume Calculation: $= (\pi^{re} n)(7.43 \text{ gal/ft}^{\circ})(3 \text{ casing volumes})$ Purge Volume (gallons) for 2 = (0.49)(5), 4' = (1.95) (h); 5' = (4.41) (h). Calculated Purge Volume (galions) Actual Purge Volume (galions): CUMULATIVE. EC. TURBID/TY T'ME. pin. COLOR CHIMER TEMP 000R020 VOLUME (gal) (units) (Umbos/cm 25 c) (visual) (visual) (2400 hr) really 5 SB 155% ham Mary ____ Purging Equipment, Pey 75 tan tal Samping Equipment peristation Laboratory: On sitie Cate Sent to Lad: Chain-of-Custody (yes/nd) Field CC Sample Number Shipment Method Sp. t with (names/organizations): Well Integrity: Quantity: jContaimer: Preservatives: Hitered (type): Remarks: th AG noul Figh Harbid. -- Strut $\sim \sim$ 530mlAG oclor (more diesel Hel NO VER HC svv Page, _____ of____

Signature._____

pgG

Well #-	5P-16
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Sample #:_

61201 Project Number Date unrisde Protini Project Name . coation Sand to the Barlo Project Address 1 harport Sampled By:_ 195W/7K Purged By: Clent Name: 🖉 👍 Sacasik 50730 10:5:00 ery UNI -2"BH. Sceenl 21MSns. Casing Diameter: Other Depth to Water (feet), LA - D. Karls O Purge Volume Measurement Method: Date Purged:_____ Dapth of Weil (feet): 🦳 📿 (Purge Time (from/to): Reference Point (surveyors notch, etc.): Water Level Proce Used. Day/Time Sampled: Purge Volume Calculation: (gr#h)(7.48 gal/ft*)(3 casing volumes) Purge Volume (gallons) for $2^{\prime} = (0.49)(n)/4 = (1.98)(h)/6^{\prime} = (4.41)(n)$ Calculated Purge Volume (galions): Actual Purge Volume (galions): TIME CUMURATIVE: pЧ EС COLOR TURB DITY. ANO ANO <u>CTERR</u> (units) (umhos/om 25 c) (visual). 2400 hrt. (visual) VOLUME (gal) \leq 32 201 121 Ð hon to vig. CPUSA THEY/Samping Equipment Purging Equipment: 200 10 mg Date Sent to Labr 2/6 In Sale Laboratory: Field CC Sample Number Chain-of-Custocy (\$93/hc) Shipment Method: Sp. t with (names/organizations): 2000 189 We. Integrity: .) Quantity. Container: Preservatives: Fintered (type): Remarks: 16 Sparl 4 Dr.C d. Page 1 of Signature: Pgg

Spring 08-52 Date 6/15 Sheet 1 of 2 Boring Location: PACIECO grotun Uwater GROUP 2027 Ezereko eta (j. Sult 200 8622 B. Assi detir 981 M 200 220 140 (faz 200 305,3988) Pgg SP-32. Logged by Ster Westher Stand Drilled by/Melnod E Suffasey 181 JEESFSALL-S Sampling Melmoo 👘 Size 🕺 REVARKS: Drill dation, sample procedures. SUVVARY lenetrotion lesiotnoo Water Content Samp'e Samp'e Nucrber Deoth Somplo Socorery ; water conditions, heave, soil variations. S 100 G Color GPI proberruns Achige UCX. Sala GRAVEL (111) 0 FS (5) 0... 5 Т Ł 1 ---Questin --4 Robert Marsh , & Philipping SHT Len Ing ρ 2 Ż · ···- - ----14.72 -X. 3 -I 34 2 T Ban Maria a Sun series 12 43.2 -S/L+ Т ŝ 5 ł Bring Moist Hubber FLAR SILLSAND 8 — 3 ï g g vit were (gi SILT: 1900 Ċ. 575- 20 5-12 5.5 ÷ 1 --2 - Berne new strang S<u>:4</u>7 3 3 ---Marcan and the S Michalove £. 5 -1.5 1414 8 I SAND SHOT dia suker et dinko UPLESSE CONST 8 8 -540 mg S 12 9. 1.82.1 ZQ (****

Care Sheet Lof Sering Location: Baring ____ 23 CULIC GTOLLTIC WATCH GROUP 22 TO Essible Aug F. Suit 200 Beat al Wastington 99102 206 8250 - AU (F4X 208 22) 5460 PgG _____NON_NON_____ 58-33 ico _ upgged by _____ Weather ___ 6794 S 127 Orified by/Method 277 . - شــ Sampling Method ... Size % REMARKS: Drill deficing sample procedures. SUMMARY Watur Content Sumple Number Serrpio Recovery l'avetralian Resistance S water conditions, neave, soil variations. Ξ Depta LOG GÍ Color Max. Range 40 0 · --i 1 2 ÷ 2 3 3 -- .--4 . 4 5 5 ī 6 6 I _.__ I ... 7 7 ----ļ ÷ ł 8 8 <u>g</u> _ - -9 ÷ 10-С L 1 2 2. - - i 3 3 ê. 4 15. 5 6 5 7 7 7 3 8 1 Q 9 i -10 -

ODTWE 14.19 Pt below -12 drilloss Expert Mensurus @ 1225 \$1250. SUL TOC = + HOGE It provegrant ste segrand. 5.277 SW J-MW-J. SINCE MW=3= 9,2250 TUC WW-3: TOC = O Tobun J 251 - Top Deviced In the PVC wellens 6.16 9.5 GWISCER & SP-31 @ 36-40FK. G SR-32-40635-40 1445 @ 58-32-206 10-20 (Pro) 153

GROUND	WATER SAME	PLING FIELI		791			M. N-L
				w-	1	Sample #:	
Project Num Project Nam Project Ado Caent Nama	ге: <u>Силин</u> ress: <u>Адац</u>		D: U: S7	ate: boation: ampled By: urged By:;		1 1	·····
Casing Diar	neter:	2"4	6"		Other		
Depth of Wi Reference ?	ater (feet). <u> </u>	<u>- 12</u> 3. jeto.): <u>- 17</u> 24	Da C//1. <i>U</i> PL	ate Purgo: Irge Time	+ .¥÷	ent Methodi <u>、</u> 20 <i>ビター</i> ターンへ 20 (ペーターンへ)	
	Purge Volume Ca Purge Volume (ga Calculateo Purge)	llons) for $2_{i} = (0.4)$	49)(h) (A <u>1-1</u> (1.96))	(n); 61 = (4.41) (1)		
TIME (2400 hr) 1 <u>2 \$7</u>	OUWULATIVE VOLUME (gal)	рні (units) (ur 17,4 <	EC C mhos/cm 25 c) (名长6	VOLOR Visuali	TURE DUY (visual)	0 007 :4.6	OHHER JAPAU
223		7.60	<u>adı</u> <u>adı</u>			14.2	176 176 163
1230	2.5 3.5	7.75			<u>hi idanosy</u>	11.5	150
Purging Equ	<u>, 3</u> 94 - 2,224 - 3 ² 6- Ipment <u>(1.11 - 1944</u> 37-2 5	19 7.74	<u>)ar (4.6. –</u> 80 175		juipmenti	193	144
Laboratory:_ Chain-of-Cu Shipment M	stody (Ye9 inio):	Kelmit.	⁼ e	eld CC Sa	Lac: <u>4/1</u> mpte Numberi mes/organizat		 >
We Integrit	y <u>Je-J</u> Container F		- Flitered (type)	iR	ethanks:	1300	
	L Vol- 146-23	HC.e.	\rightarrow		Destruction TPH		
<u>196.</u>			· · · · · · · · · · · · · · · · · · ·				· · ·
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	WATER SAMPLIN <u>G FIE</u>	MW-2.	₩ell #: <u>SP4(_) -</u> 2 Sample #:
Project Num Project Nam Project Addr Olient Name	сі, <u>Szazi de 475-</u> ; ess: <u>28-52-21</u> (5)		1 12 S
Casing Diam	ieter 2'	4'5'Othe	
Depth of We Reference P	tor (feet): 102955 I (feet): 20 dint (surveyors hoton, etc.). impled: 1430	Furge Volume Mea Oale Furgeor Purge Time (from to Water Lovel Probe	<u>31/14</u>): <u>1327-></u>
		≤ (πr²h)(7.48 gal/ft²)(3 casing volun (0.49\(h): 4" = (1.98) (h): 6 = (4.41) (h rs):Actual P	
TIME (2400 H) (53.0 (33.7) (33.7) (33.44) (33.44) (33.44) (33.44)	CLMULATIVE DH VO! UME (gal) (Units) <u>10.24</u> <u>7.79</u> (<u>.0.</u> <u>7.67</u> <u>1.75</u> <u>7.66</u> <u>2.23</u> <u>7.66</u>	EC COLOR TURB (umics/cm 25 c) (visual) (vis e? carca i a c 4 i a c 6 i a c 4 i a c 6 i	
Purging Equi	ртер: <u>6 Сор</u> инд/ТВК <u>а-</u>	1965	
Laboratory: Chain-of-Cus Shipmont Me	tody (resinc)	Cate Sent to Laby Field CO Sample Nu Split with (names/or)	~fbar
Well integrity	New could		81430 2125
Quantity.	Container Preservatives	Filtered (type): Romarks	

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Page 1 of 1 PgG

GROUND	WATER SAM	PLING FIELD D	ATA SHEET		Well #: 🚊	<u>4673</u>
			アン・フ		Sample #:	
Project Num Project Nam Project Addr Client Name Clasing Diam	0: <u>380-</u> 985: <u>380-</u> (31-)	175 <u> </u>	Date; Location; 	Ву:	- <u>1</u> 5 - <u>1</u> -	· · · · · · · · · ·
Depth of Wa Reference P	roiht (survøyors hoto ampied: <u>721/</u> Purge Volume Ca	0 n. gto.): Y (<722 Iou ation: 6:74 (m ²	Date Purge Purge Titt Water Let h); / 48 gal/itf)(S ca	ume Measuremo ged <u>375 (77</u> re (from/to): <u>111</u> ve Probe Usec ising volumes)	<u>4</u> 33->	ε·
		llons) for 21 = (0 49)(1 Volume (galons) <u>4</u>		= (4.41) (F) Actual Purge V	olume (gallens)	
TIME (2400 hr) <u>755</u> 1944 1944 1947 1954 1954	CUMULATIVE VOLUME (gal) 0.4 1.0 1.6 2.25 2.5	(Linitis) (Limitos 	EC COLOR Von 25 c) (Visual) (2-0 5 7 0 5 0		077 077 151 160 198 198	
Purging Equi	oment <u>i (ki în</u> yliyi);	Tolenson Total	Samping	Equipment:		
Chan-cf Cus	S.kź tody (Ødine) thed:		Field CC 5	to Last <u>(//</u> Sample Number, (rames/organizat	· \	
Well Integrity		·····		0	1520 pole	sel s
Quantity:	10 RG 100 RG 100 RG	Preservatives F te	red (type).	Remarks:	., т. т.р.н.	

	<u> </u>	
Signature:	alen -	

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Slugtest Menud Det 5/31/2014

Dere- Star

10,418 (STATION

SMW-7

Stur= 10.580 1500.00 Start 106.00 10.000 10.52 (610:00 10.52 (610:00 10.53 2.11 Station 10.53 2.11 Station 10.545 10.65 0 15,20.20 10.65 0 15,20.20 10.65 1024.00 10.65 1024.00

15-610 1:3320

See Same

SMW-1

10.556 10:20-15 10.556 10:20-15 0.16 10:27:30 1.080 16:32:00 1.080 16:32:00 1.080 16:30:00 10.00 0 16:30:00 10.00 0 16:30:00

Surged UL Sugert 5/9/2014 PTW Tim 4.6 CAVER 1107 - Approx +/- Qn. 1107 - A+ ioF+ Metal Bruke Pistos group Ne , 2.70 SMW-1 9.85 1055 1257 17:24 SMW-2 l(o)SMW-3 4-16

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	GROUNDWATER SAMPLING FIELD DA	ATA SHEET	Well #: $SMD = 1$
	Sampling Event 90(508	freil I	Sample #:
\cap	Project Number J G-1201 Project Name: Survive Restrode Project Address: Survive August- Cilont Name Code Survive Survive Laboratory: On Sola Chain-of-Custody (Vesino): Shipment Method	Date: <u>F-26-15</u> Location: <u>A-7-7</u> Samp od By: <u>S</u> Purged By: <u>S</u> Date Sent to Lab: <u>8/5</u> F sid CC Sample Number Sample Spill:	
	Depth to Water (feet): $19:37$. Depth of Well (feet): $-19:37$. Reference Point (surveyors holdh, etc.): 190 Sampling Eculoment: $7 eF^2 - 7 Ag$, $6 - 9 e^{-2}$ Three-Casing Volume Constant (OVC): 296 : = 0.48 gof : 4-in Purge Volume = ft of water 10^{-2} x CVC $2:13^{-2}$ = TIME CUMULATIVE pH EC (2400 hr) VOLUME (ga / L) (units) (umbos/orn 25)	non <u>= 1</u> .97 qpf : 6-inon = 4.41 gpf gallons Ca Temp TURBID TY	-> <u>P & G / 50</u> Pv== = ~ h) (248 gal-52)
Non Riters Non Non Non Non	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		145 12.68 145 10.92 146 16.03 145 16.02 145 16.02 145 16.02 145 16.02
	Well Integrity: 1.60 (Bottle Inventory Day		8-26-15
	Quantity: Container: Preservativos: Fiilered (type	e; Remarks:	
0	Signature:	PgG Pa	ge / c [*]

<u> </u>	ROON	DMAILNO	ANTELING	FIELD DAT	ASILL	1	vveii #:	<u> 1445 –</u>
Sa	ampling 5	vent: Pets	08	iz-	766(12		Sample #:	
Pr Pr Cl La Cr	roject Nar roject Add liont Nam aboratory	ress: e: ustody (@ind):	Marte Pro		Sampled B Purged By: Date Sent t	<u>Stundy et ale</u> X ¹ Stunda- ci⊥aci <u> & 17 / /</u> ample Numbert		
		ater (feet):				me Messuremer	t Method:	
De Re	epth of W eference ⁽	el (feet): Point (surveyors	noton etc.):		Purging Eq.	Time: 1304 Loment: 24	1011 m	
		au pment: 🛛 🗁 🗧		<i>≏[-46])</i> = 0.48 gpf : 4-inci		s Probe Used: &Jach - 4 41 ant		
		ne = ft of water j				lons Ca		
				EC (umhos/cm 25 c)	Temp. (C)		522	19402
	-7557	. осо ис (gai на 2-і	450 AMEN	.=	0.43		1417	. U. B
	-	2 - 3 2 - 3		540		0.0		3.90
		[_24	7,39			0.0		
I	1323	2.0	7.38	1010	18,24		(572	/ 2. 97
	3,23	2.5	7.37	1010	18.16		:58 _	10.9
	(331) (334)	2.75 3.0	7.37	1210 1010	18.16. 18.23	0.0 	158 159	10.9 <u>1</u> -
	<u> </u>	21						
 		\bigcirc) - $_{2}$	$z \sim z$	2 فيتن الروان		nute-Cl		/
			Delver		-		50-7 M 2 K	0'
We	el Integrit	y jard						
	antie Inver Lantity:	ntory Container 1274 M	Preservative	Day/T s: Filtered (type).	;	d: <u>9-25-</u> Remarks: Cere Cardin		5
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					·	Pgg Pa		

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Sampling Event: 2015 08

Samp e #:_____

Well #: $_____$

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(``)	Project Na	ame: S.J.	77 - 36 . See P			5		r
	Project Ac		eta ki		Sampled By	y	SU	
		ne <u>Sizy</u> s	1.1		Purged By .			
		y <u>- On Skie</u>				o Lab: <u>S/D</u>		
		Dustody (yesho): Method:			Sampe Sp	ample Number:_ 9		[
		Vater (feet):					at Eductoria	
		vater (reet.: <u></u> Vell (fect)		·		me Measuremer /Time	it wethed.	
) Point (surveyors r	i otabilateliri			uipment <u>C</u> A		194 . A. S.
		Equipment, <u>294</u>				Frace Used:		
		ng Volume Constant						rh n 17,48 (gal/ 1 2)
		ume = ft of water _						
	- DME	CUMULATIVE				LUSB'D'TY		
	(2400 nr)	VOLUME (gal / L)			(C)	$ \langle v_i sua / N^+ U \rangle$	ORP.	DTW
	150	6.1	7.12	2720	2.47	2.4	85	\sim
	1704	0.5						10.54
	17:58		17 2.2	2690	14:55		12 ·····	10 73
Edde -								
Reinte			· ·	2875				•
	- 10 M G	1.75	7.33		10.94	_		U 7 8
Ror	1230	61.2	7.53	2650 2650	1924	5.6	.32	·
12	10.05	2.25	77 3 7	2650	8.43	122	135	i
24		_			0,-10	- <u>21</u>		C
			*		-			
			Dergt	Haras, Cart		nge Luna-D	/ 	-
						57		
İ					Gu.	low-green		. >>
	FAR J.	Com A Yas	S. 2-51	4	- 5 :	ign-olar b	(Pelon Co	6-4 J
	WellIntegr	ity: Good						
	Bottle Invi					a: <u>8-26-</u>	15 13	2.57
	Quantity:		Preservativ	es. Filtered (type):	F	Remarks:		
	(AG-1-				Let Centr	<u>F Spje</u>	
					· · ·			
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-						DAC		·
	Signature:					Pgg	ige_ (of i

	GROUNDWATER SAMPLING FIELD DA	TA SHEET	Well #: <u>Smw-L</u>
	Samping Event. 7 December 226 Syrle	noto NO3.	Sample #:
\cap	Project Number. Project Name <u>Summyside</u> Am port Project Address: Client Name Laboratory: <u>Onsite Env.</u> Chain-of-Custedy (yes/no): Shoment Method: Depth to Water (feet): <u>9.42</u> Depth to Water (feet): <u>9.42</u> Depth to Water (feet): <u>9.42</u> Reference Point (surveyors notch, etc.) <u>Toc Nevth</u> Sampling Equipmenting on Statting	Date: 12/23/15 Location: Sampled By: 1000 Purged By: 1000 Date Sent to Lab. 12/24 Field CC Sample Number: Sample Split: Purge Date: Time: 12/23/13 Purge Date: Time: 12/23/13 Purging Equipment _Perils	Method: bucket 5 12:40- Haltic atering ET
	 Three-Casing Volume Constant (CVC): 2- not = 0.48 gpf = 4-inc Purge Volume = ft of water x CVC = 2 	n = 1.97 gpf. 6-incr = 4.41 gpf / 🍎 galons Ca	
0	TIME CUMULATIVE pH EC (2400 hr) VOLUME (gal / L; (units; (umhos/om 25 c)	Tem: IURB 2174 (C) (Visue) NTJ 14.3 Mod 14.3 61.59 14.1 28.23 13.6 12.17 13.5 (0.63 13.9 7.49	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
	TD felt soft on bottom, (se Dakton 450 at 12:16 9 = 300 mb/m.m Wellnegrity Total mitrate 2 Nit Bottle Inventory Day/T Quantity Container Preservatives. Firered (type) 7 AGA None MD 2 250 HDAE None ND	Time Samples: 12/23/ Remarks; 1	Ly (F/off Bottom 15 13:25
0	· · · · · · · · · · · · · · · · · · ·		: :
	Signature:	Pgg Pag	::= of

[2-16-2015 Noz Recon

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(Sample)		ļ	i – H	
Location	Bettie?	time	Depth	Test-Stry.
P-34-36		1:000	35	~ zo - thoto
- , !	Ϋ́	020	1 (t-75) 1	Storry/L
SP-35-11	Ý	1100	111-15	15 mg/L - son hisgest - Looks dike
9-36- ¹¹	Ϋ́	1 113 P	11-15	Supry/L
\$-37-11 	Ý	(200	(r.15	-5° mg/L -> Shipp never lois of the Messing
58 39-11 1	Ч	\2.58 	¦ (l-+≸c _o	10-1. String /
0-39-1	Y	1330	ts =2 0	Scarto D. NEUrof L. D.
SP-40+11	۲	1015	 /(-z(Seas - 11-2 Newy Pofusal, store gain gain Robs Studie gain 10-isturies/c

1973 1977



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12/15/2015 Sumperie Aurpat OCN Unsite @ 1040 Geoplan Carloty + Superf Speake was 10 Not well Local -, Mul Dig to 4Ft - Surviving Fis under 1100 Drile Bran Velan - Trever K. SF# Aug - Servers and in Rig 144 Przsant by Andlan Orgent sty studope 1150 Driverson, Sound P's at borrow. 325 Cartgorrowiping to antitan is also have Poling Augusto Hart over 1000 Solton ato (4)-Max available w/ 36 Sal Loolley 37 They of Fredrighted yul_u 936Rconstruit rail with Pro-222 1 11225 and mar E The art of Block Creek So South South of PVC & ALE Martin Jo Fringe last 3Ft of Lell Decis 2 12/16/5 2 Butuntonspies and Contra They while proportional date SS- Cogetter,

DTUN= 9.55 \$12/16/15 AIS Well No Starte WELL INSTALLATION _____ Opic 12🖍 🗠 REPORT 370-713 Les Strage & Allyner log No. Öl∌r≷i≥ Orriki Abbridariate n n ele de de da Minuman (Ruze y Vi Abbye (ungung) Apprez, Elevation. Type int Monument Markey EM Depth i∕-Feet Stickup: Vonoment 💦 🔄 Wo $\Delta n \to 3 \, u^* l^*$ սելեսլ Seci Valorial Joseph Baranala Diameter - δ^{\pm} Apter eve Dore Right Floe Digmener 😥 🖤 Riser Pipe Materia - 32010 Type on versions (76 ver<u>s / 17</u>1 10 –Rina skolvy Yes 🗡 – Kulij 30 B Sedl Mareria _____ Firen Haek Maieria filter Rock Size 🔜 37 Solven Nomerer ${2^{\prime\prime}}$ Solder Sur Size PUC Miller OFTA Spreen Duilst un famil Myriac) Afre Wound 14 ien Rige Dis malas -Z 44 44 Tan Proxi Longra - 💷 👘 Tabi tiya Malazisi 🦓Va 👘 💷 .. — Bottom SAL Team Pacific Groundwater Group les y Elster, y solar Skort, ta estor 1946 - 324-114 - Atl 713-sbee

- 7 0 h 937 Boring Location: Dore - PACIERO STOLICIÓN METOROL P 2077 Essues Akole - Sulis 200 Sistic - Asetindor 83, 02 206.329 (140) - FAC 206.329 6368 Job No. Jab . Logged by _____ Weother 8/25/2016 Drilled by/Method Sampling Method. Size % REVARKS: Drill defion, sample procedures, SUMMARY Water Content G S F dun Sample Secovery Uep'h water conditions, heave, soil variations. LOG Color Vex. Korge Ô---194ο. 12 Kr 1750 Kachel Nepas Samuel Plastic Seofly Small Femile Cold Car, B-Algar 2 2 3 -3 -Carry Ear & Pits 4 . -5 ...-783 NESS-135 8 ----- 8 Jankal 10, Past burners CUI IZDUM, PENSage 8 ---8 7PZ Dimbal Commi Roe-0 ----New/ Calls may On ----Strange Sty 2 PVC and where the Maprices Ceder Hahl J.L. † ₽ i Bot ee Not they South Rock Pitcheldes 6 Sur after a top for the top Scall rible of mystar 1 Carl Ģ. 0 -



Sample #.

Project Number: 11 12 13 24	Date (12-17)
Project Name June 11 August 1994	Location
Project Address.	Purced ByG 5 CA
Client Name:S (22 gr) 3 min	Purged By 📿 😳 😳 🗠
Laboratory: USEY	Date Sent to Lab
Chain-of-Custody (yesind:	Field CC Sample Number:
Shipmont Method.	Sample Spilt:
Depth to Water (feet): 9:37.82.04	
	レク Purge Date: Time: パットル ーク
Reference Point (surveyors notoni etc.):	j Purging Edulament
Sampling Equipment	Water Lever Probe Used:
Three-Casing Volume Constant (CVCc 2-Inch = 0.48 gof : 14-i	inct = 1.97 gpt = 6-inch = 4.41 gpf = = PV=(=r ² http://48.ga/?)
Purge Volume 1 ft of water x OVC =	gallons Casing diameter (Ibin)
TIME CUMULATIVE bH EC (2400 pr) VOLUME (ga / L) (units) (umhos/om 25	c) (C: (visue / NTU)
17-2 0.1 7.2	18.5
1010 1.6 7.2	12.4 d- DTW9.86
1820 7-Z	12.4
	8
A	551 M 14
Greg pressure an young.	Lodes a sister
	had a state
	19 - 1 51 1 1/ 120
	- 101 2c
	< 1813
Bottle Inventory Day	y/Time Sampled: <u></u>
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17+17) (610</u> co): Remarks.
Bottle Inventory Day	y/Time Sampled: <u>4(+17-17) (610</u> (c): Remarks.
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17+17) (610</u> co): Remarks.
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17-17) (610</u> (c): Remarks. (200)
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17-17) (610</u> (c): Remarks. (200)
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17-17) (610</u> (c): Remarks. (200)
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17-17) (610</u> (c): Remarks. (200)
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17-17) (610</u> (c): Remarks. (200)
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17-17) (610</u> (c): Remarks.
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17-17) (610</u> (c): Remarks.
Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17-17) (610</u> (c): Remarks.
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(+17-17) (610</u> (c): Remarks.
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(-17-17) (610</u> (c): Remarks.
Bottle Inventory Day Quantity Container: Preservatives: Filterod (typ	y/Time Sampled: <u>4(-17-17) (610</u> (c): Remarks. (200)

0	GROUNDWATER SAMPLING FIELD DAT Sempling Event: 0.0(7 - 0*(A SHEET	Well #: <u>SMV-2</u> Sample #:
1	Project Number:	Date: Location: Sampled By: Purged By: Date Sent to Lab: Field CC Sample Number:	······································
	Chain-of-Custody (yes/no) Shipment Mothod: Depth to Water (feet): 9.62 / 9.65 Depth of Woll (feet)	Purge Volume Moasurement Purge Date/Time: 10-4	Method
	Reference Point (surveyors notch, etc.): Sampling Equipment Three-Casing Volume Constant (CVO), 2-inct - 0.48 gpf ; 4-inct	[Purging Equipment <u>6-1</u> Water Leve, Prodo Used	<u></u>
0	Purge Volume = ft of water x CVC	galions Ca Temp. TURBIDITY (C) (visual / NTU) (2, 7	
	Hirfizza offizi		
	Well integrity:		
	Bottle Inventory Day/T Quantity: Container: Preservatives: Filtered (type).	Time Sampled: <u>1732</u> Remarks: 	
		·····	·····
0			· ·
	Signature:	PgG Pa	ge

Samping Event: 2017 - 04	TA SHEET Well #: Sample #:
Project Number: 01777 Project Name: 0100000000000000000000000000000000000	Date: (12,17) Location:
Depth of Weil (feat): Reference Point (surveyors notch, sto.): Sampling Equipment:	Purge Volume Measurement Method: Purge Date/Time. I <u>S. 48</u> Purging Educement: Water Lovel Probe Used th = 1.97 gpf = 6-inch = 4.41 gpf = PV=(\pm 1° h) (7.48 gal/t ²)
Purge Volume = "t of water	gailons Casing diameter (*(*n): Temp. TURBIDITY

Well integrity:

Bottle Inventory		Day/Time	Sampled <u>1/1</u>	2/17 102.	2
Quantity Con	tainen Preservativ	es: Hiltered (typo):	Remarks:	ĺ.	
- 7:15		··	Party	Hest	 · -
			······································	· ·	
		_		- <u> </u>	
·	· : :		. –		
				······································	
Signature			Pge	Page of	/

Well #:	514 6-9	/

Sampling Even: 2.217- 54	Sample #:
Project Number: 3 3 7 2 20 Project Name: Claring Context Project Address: Claring Context Criain of Oustooly (yes/no: Claring Context Shipment Method: Claring Context	Date _ //2/17 Location Sampled By Purged By: Date Sent to Lab://2/17 Field CC Sample Number Sample Split:
Purge Volume = ft of waterx CVC=	Purging Equipment: <u>(j=0.32260-</u>) Water Level Probe Used: <u></u> Inch = 1.97 got 1.6 Inch = 4.41 got PV=(n /2nt) (7.46 gal102) gallonsCasing clameter (ftlin)
TIME CUMULATIVE pH EC (2400 hr) VOLUME (ga /L) (units) (umnos/om 25 15/07 7.1 7.1 7.1 15/14 7.1 6.9 1.5 15/23 2.7 6.9 1.5 15/30 2.7 6.9 1.5 15/30 2.7 6.9 1.5	Temp. TURBIDITY (C) (Visual / NTU)
Well integrity: Bottle Inventory Da Quantity Container: Proscryptives Filtered (type) 	ay/Time Sampled $1 \le 3 >$ be; Remarks $- \frac{P_3 + 1 + 2 + 5}{2} = - \frac{1}{2}$
Signature:	Pgg_{Page} [

Signature 1. an p. cond 1. an ye 1 (b. any e. 1) (b. any e	Consistent of the second of th
Company Eale	Chain of Custody Burn
Dimments/Special Instructions Objects/Proceed Instrefeet Objects/P	An this is down in the second and th

Sampling Event. ZOLT - Sully

Well #: _≤m∞r-, } . Sample #: _____

Dro nat N. m	be-			Date: 747	21/17			
Project Number Project Name: Sunning side Ard part				Location: Adjacente the cumulany				
Project Address:				Samp od By: 100				
Client Name:				Purged By:				
Laboratory: <u>5 % 5 % 6</u>				Date Sent				
	stody (yes/no):			Field CC Sample Number:				
Shipment Method:				Sample Split				
Depth to Wa	ter (feet): <u>9</u>	48		_ Purge Volume Measurement Method:				
Depth of We				_ Purge Date/Tume: 귀성지 I구, 30, 7년				
Reference P	dint (surveyors	anoloh, etc.)(_	TOC NJ	Purging Equipment: Periotaltic				
	uioment <u> Re</u> x			-				
Three-Casing	Volume Consta	nt (CVC:{2 incl	∖- 0.48 gpf : i4-inc	on = 1.97 got 1.64 toh = 4.41 gpf - PV+1 tof h1.7.48, ga ^{(0.5})				
Purge Volum	e = ft of water	/5 x (íc =	98	clons d	Casing <u>d</u> iameter (t	:(n)	
T ME	CUMULATIVE	рН	EC	Temp	TURB DITY	1.1		
(2400 hr) V	OLUME (gal /	L: (units)	(umnos/cm 26 c;	(C)	(visual / NTU:	bow (ider	2 lodor	
(0118	0.25	<u>6.</u> 85	1247	1911		9.80/ct		
10125	0.50	6.97	142 <u> </u>	187	11	9.85/dr		
ls:BSI	1.00	7.20	1139	19.8	!!	9.86/11-	200/none	
10:44	175	7.24	1,2%	19.9	$_{-}l($	9 57 (4)+	<u>.</u>	
10.50	2.00	7.15	112	'9.Ò		9.87/cir	200/ none	
10:54	2.25	7-17		18- 9	1 <u>1</u>	9.08/01	200/ none	
I								
		-						
2.0 15			water		الأمر بالمركز			
91 - 300	melnin 9	2 = 200 m	timm					
	6						ļ	
Well Integrity								
Bottle Inven	-				ad <u>7/3117</u>	10:45		
Quantily:	Container:	Preservativ	es Filtered (type)	:	Remarks:	La davat - a a		
4	. PkGe				Brannec	NOS PHOTUS	·	
	AG AG			·	herbicid		—	
-	HATE			_	N. trat			
				<u> </u>				
						-302	<u> </u>	
			_		21	,J		
		<u> </u>						
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						- m		
د	A.A.				PQG.			
Signature:						age oʻ		

Well #: <u>Smw - Z</u>

Sampling Event: 2017 July

Projad Number	Date: 7/31/7
Project Name: Sunny side, Aurport	possion center access read to runney
Project Address:	_Sampled By: Thisk-
Client Name:	_ Purged By
Laboratory: <u>Dynesi Are</u>	Date Sent to Lab:
Chein-of Custody (yes/no)	Sample Spit
	Purge Volume Measurement Mathod: 6 weber
Depth to Water (feet): <u>Prove</u>	_Purge Date/1/met 7/3.017 53
Reference Point (surveyors hotoh, etc.): TOC NA	Purging Equipment: <u>Peristatic</u>
Sampling Equipment <u>Revised</u> the	Water Level Probo Used: wt ET
	h - 1.97 gpf τ. 6 (noth = 4.41 gof = = ΕV-(π A n) (2.48) ga (15.)
Purge Volume = It of waterX CVC =	
TIME CUMULATIVE CH EC	Temp. TURBIDITY
(2400 hr) VOLUME (gal / L) (Lnits) (Lmhos/am 25 c)	(C) (Visua 'NTL) oder/color DTW/2
0.25 7.43 797	19.0 cir norefelr 9.83/200
12:05 0:50 3.23 817	18-1 " U/1 9-04/200"
17.10 0.75 7.23 825	184 light 1/2 9.84/2=0
12:18 1.02 7.22 837	18.0 in 1/4 984/200
	18.0 11 11/11 9.84/200
12:22 1.15 7.23 834	10 (1 <u>1.</u> 1.0 <u>1.0</u>
good end think dity is !	ight, but wouldn't dam
up , Flow vote is between	en isont/un and zoont/any
Fine needed 2200 to keep fum	e ma
and the second second second	
Woll magnity:	
	Time Samples: 7/3//17 12:35
Quantity: Container: Preservatives: Filtered (type)	Remarks
	·
······	· ··
sta cunnyside set-	7 bottles _
Sunnyster	· · · · · · · · · · · · · · · · · · ·
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-Jun	POG and the second
Signature:	

Well #	t :	\leq	\sim	\sim	_	3

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Sampling Event:	2017	July

Project Number.	Date 7/31/17
Project Name: Sannyside Arrest	Location
Project Address:	Samplea By: Twh
Client Name	Purged By
Laporatory: Onsite	Date Sent to Lab:
Chein-of-Custody (yes/ho):	Field CC Sample Number:
Shipment Method:	Sample Spilt
Dooth to Water (feei): 9 - 2.9	Purge Volume Measurement Method
	Purge Date: The <u>173117</u> [3:16]
Depth of Wiell (feet): ¡ Reference Point (surveyors notch, etc.)	Purging Equipment: Pernistaltic
	Water Level Probe Used: WC_ET
Same ng Equipment Peristaltic	
Three Casing Volume Constant (CVO: 2-heb - 0.48 gpf 1-4 inc	
Purge Volume = it of water x CVC =	galloris Casing clameter (fbin):
TIME CUMULATIVE pH EC	Temp. TURBIDITY / /
(2400 hr) VOLUME (gal / L) (units) (unitos/cm 25 d)	
13.20 = 25 722 1515	
13:29 0.75 714 1528	18.4 LIV cl/ none 9 65/150 1/4
13:36 100 7.19 1529	191 11 11/10me 963/152
13:39 1.25 7.18 1529	190 4 6/11 9.64/1002
can't man tain Flow ate the	I deasn't down tusking
with length a suit it	- VUMMING
with 150mymm of 200 ml/min to be	we want y
4	
Well integrity: e too d	
······································	Time Sampled: 7/31/17- 14/00
Quantity Container Preservativos: Fillered (type:	
collectical stationnyside	- set 7 loottles _
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Signature:	F SG Page of
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Well #: Smw - 4

Sampling Event:	2017	July	

Sampling Event: 2017 July	Samp'e #:
Project Number:	Date: 7/2/17 Location: Sampled By: 7 Wh Purged By 1Wh Date Sent to Lab Field CC Sample Number Sample Split: Purge Volume Measurement Method: Ducker
Depth of Well (foot): Reference Point (surveyors notch, pto.) 15<u>C.M</u> Sampling Equipment: P _{CKC S} <u>tatt(c</u> Three-Casing Volume Constant (CVC)(2-reh_=0.48 gaf = 4-inc	Purge Date/Time, 7/3(17- 14:30 Purging Eduipment: <u>Powis Faultic</u> Water Level Probe Used:WL n = 1.97 gol - 6-non = 4.41 gpf PV=(= rein) (7.48 gallt)
Purge Volume = ft of water x CVC =	gailonsCasing d'ameter (fuin)
TIME CUMULATIVE orl FC (2400 m) VOLUME (ga / L) (units) (units) (units) 141:33 0.25 7.63 815 141:41 0.50 7.44 7.74 14.48 1.00 7.44 7.77	Temp. URBIDITY Drug dochia
Potentially strong pesticide odo wal? potentially ambrent. Sampling frich up a' lot o	r upon spenny well, in + dust drave by during
Wol Integrity, 900	
Bottle Inventory Day/ Quantity Container Prosorvatives: Filtered (type) Collected Std Summas (Le	
· · · · · · · · · · · · · · · · · · ·	
	··
Signature:	Pgg Page of

Sunn; side 7/31/2017 | poly Jour 72 15 gallons 4 steel 55 galles at hele 7 steel logalous kup area has ponded water from where run way - see photos

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Well #: <u>Smwell</u>

Samping Event: 20,77 October

	mber: 🕹 😹 🔡			_ Date: <u>/</u> 0	· · · · · · · · · ·			
Project Nar				Location:				
Project Add		· · –		Sampled By: TWW				
	e <u>Sunny si</u>		· ·	_ Purged By Date Sent		_		
Chain of C	ustody yes/nd	r			Bample Number:			
	usiouy (yeshid Jethoa: <u> ఓంట</u>			_ Sample Sp				
	ater (feet): 1%	-			ume Measureme	at Method: New	whet	
Depth of W		- 7			on entreasa en c/Tim.c. 1¢ (≩≏)			
	Paint (surveyor		τ <u>α.</u>		oshanto, n (n=(osioment: <u>n°ev∆`</u>		0	
			<u> </u>					
_		_	n = 0.48 gpf ; 14 in:	_				
			VC=					
	CUMULATIV VOLUME (gali		EC (umhos/am 25 a)	Temp. (C)	TURB <u>DIY</u> (visla 🕅	~~~	color/o dav	
19:45	0.25	7 o F	1251	8.7	·	9.92	A hour france	
ستاب ای	0.51	7 00	1210	18 9	11 48	9.9622	11/11	
			1183			9.96	"/4	
			1170			jg.01	er from	
	Z CO					9.92 -	<u> </u>	
						-		
a litra.	1.1	-					·	
41,420	milge secs	92 450	millizo sees					
			1120 2000	>				
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Well Integri	· · · · · · · · · · · · · · · · · · ·							
Bottie Inve				Time Sampl		B		
Quantity:	Container:	Preservat v	rest Filtered (type)		Remarks			
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	•					·		
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			· ·	· · · · · · · · · · · · · · · · · · ·				
	~ 1	i l	· 	· · · · · · · · · · · · · · · · · · ·				

Well #: <u>5 ~ ~ - 2</u>

Sampling Event: 2017 October

Sample #:

				Data 12	12.1.2		
	mper:			_ Date: 10	1 201112		
Project Nar Deviced Act				_ Location:_ Some of I	sy tub		— I
Project Acc				Burgon Bu	m	-	
	e <u>Sunnysi</u>	»-«		Date Sent			·
	Duisite	4.0	· .		to cab. Sample Number:		
	ustody (yes/no) - teterini			_ Sample Si			
	/ethod:Cely					, ,	
_n Depth to W	aler (feat) - <u>9 - 3</u>	3.:			ume Moasuromen		
Depth of W	el (feet):	-			e/1 me: <u>19 30//</u>		
Reference	Point (surveyors	noton leto p	_TDC	_ Purging E:	quiament: Pelv <u>il</u>	stattic	<u> </u>
Sampling E	iquipment: 🗌 🕑	v. italti	2	Water Lev	el Probe Usad 👘	NU ET	
			on = 0.48 gpf t - 4-in:	ch – 1.97 dof	6- fch = 4.41 dof	PV=(ht	r² m) (7.43 ga/ft)
	me = ft of water				alons C		I
TIME	CUMULAT VE		EC	Temp.	TURBIDITY		(eler/olan
(2400 Fr)	VOLUME (gal/1	_, (units)	(umnas/am 25 a	ј., .Ст	(visual civility)		1
12:13	0.25	7,24	৭ <u>।র</u>	17 H	53.8 <u>8</u>	15.0%	It rown for fir.
12:23	0.75	チリン	931	17.4	1 23	10 CC	
12 34	1.58	7.16	941	17.5	5.39	:0.09	*/ " - ·
12:40	25	7-15	943	EF 6	2.34	10 LG	· ///_
					3		
		-	_	<u></u>			I

g- 450 ml/2m ns issee 2 200 ml/mm

	tory			Sampled: <u>NV/36/17</u>	<u>्रि</u> ००	
		Preservatives: F	i terod (lypo):	Remarks:	Γ.	
2	IL AG	no ruo	NO	STARMOC	Monine	
2	IL AG	1	I 	. s <u>raa</u> nac organà_	phosphorus	_
2	LAG	. [·	Q - 1	1	
I	SOOH BPE	\checkmark		Nitro	~~~	
	I					
					<u> </u>	
	·					
				··		
				PgG		

Well #: 5 <u>~ ~ ~ - 3</u>

Sampling Event: 2017 October

Sample #:

Project Number:	Date: 10 30 17-
Project Name	Location:
Project Address	Sampled By Two-
Cient Name Sunnyside	Purgod By
Laboratory: Owe ite	Date Sent to Lab:
Chain-of-Custody (yes/no): Y25	Field CC Sample Number
Snipment Method: Convice /	Sample Split
Dooth to Water (feet): 9,74.9	Purge Volume Measurement Methods burner
Depth of Well (rest):	Purge Date/Time (3:3)
Reference Point (surveyors noten jeto): TOC-	Purging Environment Participal tre
Samo ng Equipment: <u>Pervis taltur</u>	Water Level Proce Used ET
	$h = 1.97 \text{ gpf}$: 6-inot = 4.41 gpf = PV=($\pm r^2 H_1 (7.48 \text{ ga}^{-1})^2$)
Purge Volume = If of water XICVC =	galions — Casing diameter ("Vin).
	iemp. TURBICITY STW Color abor
 (2400 hr) VOLUME (gal / 1) (units) (umhos/cm 25 b) 	(C) (V sus (NTL))
13:35 0 25 7.10 1578	17.2 9.96 9.58 Cir/7
	201 1960 1
13:48 100 7:07 1536	17.3 2.80 970 1/1,
15:55 50 707 1570	17.3 2,36 9.71 1/1, 1
	·
Alsond 12 mins 3 sec = 2	
the growing state -	
Well ntegrify: 0.000	
	Time Sampled: 10/30/2017 14:10
Quantity Container: Preservatives: Fillered (type)	. Remarks:
2	chivaine nervoicines
	or factor photomoro
· · · · · · · · · · · · · · · · · · ·	stampentor e_
· ·	

Well #<u>≲∽ ω - 4</u>

_ _. .. ___

Samping Even: 20.7 October

Sample #:

Project Nur	ncer:			Date: [0]	30/17		
Project Nar	пе			_location:_			
Project Ada	ress. <u>Summy</u>	side			y: TWh		
Client Nam					Twhen		
		Vet		_ Date Sent	iciuac <u>.</u> Sample Number:_		
i Shipheat M	/ethod Courts	ev		Sample Sp			
	ater (feet): 9				ime Measuremer	n Method:	onched
	el (feet)		_	Purce Date	e/Time. <u> 12/34/1</u>	2 14.47	₽
	Point (surveyors	(noton, etc.):	TOC. N	Pure na Ea	:u pment: 👘 🏁 🎽	istalter	
	iquipment Pev			Water Leve	a Prope Used	WL ET	
			= 0.48 gof : 4- no				r² n) (7.48 igslift) (
Purge Volu-	me = ft of water	x CV	C =	ga	lions C	asing clameter	r filme)
T ME (2400 hr) N	CUMULATIVE VQ: UME (gal (1		EC Jumhos/cm 2 5 o	femp (C) (TURBIDITY (Visua (INTU)	r	
					8.83		
14,257	0.75	7.47.	775	17-9	127	7.56	U. none
15:08	1.25	7.46	799	م)، کا	1 k3	9.55	6/ 9
15:15	1.75	7.45	802	15.7	157_	9 55	de/ none
							a i
i							
i · —							
450 ml/1~	n sysee ing	£					
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ļ							
We'l Integri	y good				///////_/////////		
Bottie Inver	*	_			ed 10/30/17	15 3	0
Quantity	Container	Preservative	st Filtered (type)		Remarks:		
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		· · <u> </u>					
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Signature:	A	- (rge _{Fa}	age	of
					-		

GROUNDWATER SAMPLING FIELD DATA SHEET Well #: _______

Sampling Ev	cont January 20	16			Sample #:	
Project Num	ber: 3Gz I		Date: 1(3	12018		
Project Nam			Loost on:			
	ess: Sunnyside, V	VP	Sampled By	twh		
Cliant Name			Purged By:	TWL		
Laboratory:			Date Sent to	: Lec 👘 🛄		
	stody (yes/no): 🔄 🦣 🕵	5 <u> </u>	_ Field CC Sa	imple Number:		
	ethod: courrier	-	_ Sample Spli	<u> </u>		
Dooth to Wa	ter (feet)	9.B{	Purge Volun	ne Moasuremer	nt Method: 🖉 🤷	uchet
Depth of We			Purge Date/	Lime: 1/34 [24	S1:01 8K	
	aint (surveyors noțon, e	TO THE North				
Samplea En	arments, Peristalt	ie <u>na na u>	Water jeve	Prope Used:	WLET	
	Volume Constant (CVC):[
Purge Volum	ie = ft of water	<u>x CVC + .</u>	gal	ons a	lasing diameter	(E010)(<u> </u>
	CUMULATIVE pH		Temp.	TURB DITY	color 1.1	aR9/.
(2400 hr) [V	OLUME (gal / L) — (unit	is) — (umhos/am 25 <mark>c</mark>	:) (C)	TURB DITY (VISUR) / NTU)		
10:32	3.75 8.30	. :409	14-1	fight.	it orsen no	~1 -(36 3/12·
1014L		1430	14.1	·	1/10	-104.7/10
· ·	Sil. 4 7.5				i / ii	-87.5/10.1
	2.00 7.96			<i>(</i> ₁	/	-1777/10.15
	2.25 7.9		-	<u> </u>		-107.1/10 1
11:14				cle	delmon	-912/10
						- secto
41.19	2.75 7.5	· · · ·	15.1		""-	- <u>-</u> 68.5 (10
11:23	3.00 75	4 1389	15.0	ζι	8/10 ···	- 56 <u>- 1</u> 10
oakter	melling 22 220	o melania almos	t unining	and orp	to him	y a lon
-T1-442	to veace.					
Well Integrity	goed					
Bottle Inven				1 1/31 201B	00 1)	
Quantity:		vativos: Filtered (type		Remarkş		
E.O.	IL AGE NO	no.		pest/herb	-	
1	Son Hidpe, no	wo		witrades.	··	
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		···				
×		·		PgG		
Signature:	- fu	··· ··· _		PgG _₽	age l o	

Sampling Event. January - 7018____

	Project Nur	nber			Date: \[31/2018		
	Project Nar	re: <u>Suywas</u>	de Augor		Location:			
	Project Add				Sampled B			
	Client Nam				Purged By Date Sent			
		_ <u>Oinisi≹i∢</u> ustociy (yes/no) _	M.e.s			tericae Sample Number		
		lethod: Couv			Sample Sp	: <u> t:</u>		
	Depth to W	ater (feet) <u>10 (</u>	B & 10 -	45 10.16	Pürge Volu	.me Measuremer	rt Method:	
	Depth of W	el (feet):			Purge Date	e/Time. <u>/St[18</u>]	1219-	
		Point (surveyors		TOC N.		uipment <u>Pev</u>		
		ouroment: Fem				el Propo Used: M		a. 7,42 and 763
		g Volume Constan me = ft of water			en 1.97 get <u>g</u> a	6-inph = 4,41 gpf clons — C	asing diameter (
DTW	TIME (2400 hr)	CUMULATIVE VOLUME (gal 1.		EC jumnos/om 26 c	Temp. c) (C)	TURBIDITY ((sua)/INTU:	cda loder	ORP
ોત્રક્	(2:2)	(0.25	<u>1 (g</u>	973.5	14.5		dir (nene	
10-40	(2012)	0.50	1.16	1010 _	157 7	clear	- ⁶⁷ /4 =	- <u>25.</u> 2
12 + D-++-	3 38	[.0C	7.20	1018	151.7	Hast	sta -	-26.3
1234	12 483	1.25	7.16	1026	(5.)	light	9/10	-24.8
10-38	12:46	1.50	7.16	ic 3R	150	l int	M/n	<u>~</u> 24.8
(a 38	ā izi sa	. 75	7.17	10 48	14.9	light	_9 (9	- 2 <u>4.9</u>
	1 12.55	2.00	7.16	1454	15-1	1. ght	44.	-24.1
10.4	0 12 04	7.50	7.14	087	15	11	4/2	-23.7
15.45	1 13:09	3.00	7.14	10 7 3	1511	11	10/1,	- 23 3
	9. 5 2500	st/ma is		w protes		and oak	- 	
	22 - 200	1						
	i							
	Well integri	ty: grad						
	Bottle Inve			Day	/Time Samp -	ec: 1/31/18	13:00	
	Quantity.	Container		s Filtered (type	e):	Remarks:		wart
	2	LAGE	nou	none		Organoc	Nov1	The Ard
		LAG		[- Newbillich	phospho	- 102 - 102
	<u> </u>	Sm Hape	= none		-	n: trate	¢ _	
54."				- <u></u> .				<u> </u>
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						- <u></u>		
	Signature	Thi				Pgg Pa	age { c	- 12
		¥ * *				0		

Well #: <u>Smw-2</u>

Samping Event: Jun 2018 Cont

Sampling Even	11: <u>Jan</u>	WIC .	Co v v			Sample # _			
Project Numbe Project Name: Project Address Client Name: Laboratory: Chain-of-Custo Shipment Meth	s:	······		Date 1/31/18 Location: Sampled By: TWH Purged By TWH Date Sent to Lab: Field CC Sample Number Sample Split					
Depth to Water Depth of Well (Reference Poin	feet):			Purge Date	Purge Volume Moasurement Method:				
				~ ~	el Probe Usea:				
Three-Casing Vo	ume Constant ((CV/Ot. 2-inch	- 0.48 gp'; 4 in	ion = 1.97 gpf	6- nch = 4.41 gpf Jons Ga				
TIME OL	JMULAT VE	ъH	EC	Temp.	TURB DITY (visual / NTU)				
13:18	3.5	7.10	1085	15-3	clv_	- 22.3			
13:27	4.0	77.12	290	15.3	1.1	- 22.5-			
.336 4 9					c1.	-4.5			
13.4D J		7.11	1092		4	- 22,2			
							-		
	-				<u> </u>				
			<u> </u>						

Well integrity: 9000

vvicit integr	ty:					
Bottle Inve	ntory		Day/Time S	Sampled 1/3/	18 13:00	
		Preservatives: Filte		Remarks:		
						- - ·
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		·· · · · · ·				_
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L					·	-
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	· · · –				·	
Signature:	-	\mathcal{N}		Pgg	~	of
Jig 6.115	<u>P</u>			0	-3-	

GROUNDWATER	SAMPLING FIELD	DATA SHEET
	a0	

Well #: <u>Smu-3</u>

1

Sampling Event: 🚽	annary.	2010
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		Dis Martia
	Project Number	_ Date 1/31/18
	Projoch Name: Sunny side A. (port)	
	Project Address:	Sampled By
	Client Name:	Purged By:
	Laboratory: 0.00 te	Date Sent to Lab
	Chain-of-Custody (yes/ho)	_ Field CC Sample Numbor:
	Shipment Method:	Sample Spiit:
	Depth to Water (feet): 1.5, 16: 46 9.48 ⁶² (4)	*Purge Volume Measurement Method: 🖢 🛶 📥
	Depth of Well (feet)	Purge Date Time. 1/31/18, 14) 22
		Purging Eductment. Peristallic
		Water Level Proce Used I いしてて
		ch – 1.97 gpf 1 6-inch = 4.41 gpf — PVH(u 11 bil (7.48 ga/ft))
	Purge Volume = It of water x CVC = _	gallons — Casing diameter (fring
	TIME CUMULATIVE OF EC	Temp. TURBICITY solution or p
Dtw	(2400 hr) VOLUME (gal / L) (Linits) (Lumhos/cm 25 d	
9.69	14:24 KO.25 7-06 1987	
,	14:31 20.50 7.09 2.00m/s	:46 dear dear/hap - 20.4
9.78		
4.83	14:39 70.751 7.05 2.01 1/2	14 7 11 11/1186
	14 45 ,00 7.05 2.01 75	14.8 1 1/4 -183
9.85	19 45 700 <u>200</u>	
987	14:53 1.25 7.02 203 1/3	17.8 11 11/11 -181
988	14:57 1.50 7:05 2.55%	14.7 11 11/11 -19.3
i uo		
	· · · · · · · · · · · · · · · · · · ·	
	a second di	
	2, = 200ml/mm 92 = 175 ml/mm	
		'
	Well Integrity: 9000	
	P	
		Time Sempled 1/21/18 5:30
	Quantity Container Preservatives: Filtered (type); Remarks:
	6 IL HG no no	Pest/herb
	SM HOPE NO NO	Nitutes
	· · · · · · · · · · · · · · · · · · ·	·
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	- P. 11 -	DOC
	Signature	rgg _{Page} (of

Well #: Smw-4

3

Sampling Event January 2018 .

	Project Nu	mber			Date: 13	118			
	Project Nai	10 Sunnys	de Aurp	ort	Lecation:				
	Project Add		•		Sampled By:	The			
	Client Nam	e:			Purged By:	Tuh			
	Laboratory	Onste			Date Sent to				
	Chain-of-C	ustody (yes/ho):	403			nple Number:_			
	Shipment M	Aethod: Cours	-e'c		Sample Spl L				
	Depth to W	'ater (feet): <u>91-1</u> 7	4 @	10:489.748	Furge Volum	e Measurenter	if Method: 🖢 🏎	hef	
	Decth of W	e! (feet)	-		Purge Date/T	ime: \ <u>31/26</u>	18 15:41	i	
	Reference	Point (surveyors r	natch, etc.):	TOL AN		pment <u>Pewi</u> sł			
	Sampling D	louipment <u>Perr</u>	statte		Water Level	Prope Used 🖂	JL ET		
				n = 0.48 gg2 4-ind	n = 1.97 gpf : 16	Hinch = 4,41 gpf	FV≕ π ≃ r	n) (7.48. gal (??.)	
		me = ft of water	· · ·		_ gal c		asing d'amotor (f		
S	T ME	CUMULATIVE		EC	Temp	TURBIDITY	color dox	ORP	
þω	(2400 hr:	VO, UME (gal / L)	(units)	(umhos/om/25 c)	(C)	(<u>visual</u> (INTU)			
9.75	15:46	6025	7.43	885.1	3.8	clear	claw frome	-39 . 5	
9.78	(515)	0.50	초 <u>문 </u>	660.7	14.2	11	4/1,4	-37.6	
9.78	5'55	0.75	÷39_	1. 088	14.3	£ 4	1.1.10	-37.3	
9 78	15:58	1.00	7.39	890.1	4.3	11	±⊈(c	-37-36.9	
9 78	16'02	1.25	7.34	694.8	14.3	16	11/11	-35.7	
9.78	16:05	1.50	7.39	896.4	14 2	/ t	ulu -	-373	
9,78	16117	2.00	7.33	895.4	14.2	11	11/10	-354	
9.78	616	2 25	738	899,9	14.2	11	1 / 4	-32.3	
9.78	16:21	3.00	7.36	°	4.2		1.///	-36.0	
9 78	21 - 250	millin 50	736	89999	14.2	1	14/10	= 357 7	

Well relegate Good

Bottle Inve	ntory	Dav/Tin	ne Sampled 1/-til	2018 16:30
	Conte her:	Preservatives Elfered (type):	Remarks: Pest/H	ede
		:		·
		·	·	··
			·	
		·	·	
			·	
Signature:	Au	· · · · · · · · · · · · · · · · · · ·	PgG	Pageof

