

REMOVAL OF DIELDRIN- CONTAMINATED SOILS

**NORTH STAR DEVELOPMENT – PHASE I
TAX LOTS 701, 900 AND 1000
MAP 062W32C
SALEM, OREGON**

Prepared for

I&E CONSTRUCTION

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Wilsonville, Oregon 97070
(503) 682-2500

Project #1503.10
December 13, 2017

REMOVAL OF DIELDRIN-CONTAMINATED SOILS

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Tax Lots 701, 900 and 1000
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Salem, Oregon

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1.0 INTRODUCTION

Anderson Geological, Inc. (AGI) was authorized by I&E Construction to oversee the removal and temporary stockpiling of shallow soils contaminated by the pesticide dieldrin at Phase I of the North Star residential development in Salem, Oregon.

This report summarizes the findings of previous investigations, and presents the results and conclusions of the current investigation.

1.1 SITE LOCATION AND SETTING

The subject property is located within the city limits of Salem, Oregon, in an area that was annexed into the city of Salem in 2002. The property is bounded to the north by Alpha Nursery and single-family homes (across Hazelgreen Road NE), to the south by single-family homes (across Kale Street NE), to the east by orchards operated by Alpha Nursery, and to the west by Copper Creek Estates mobile home park. Properties to the north of Hazelgreen Road are located in unincorporated Marion County, properties south of Kale Street are located within the Salem city limits.

The North Star development is planned for development of 700 single-family homes on 150 acres of land covering five tax lots. The property was recently leased as farmland for dry wheat farming. For the purpose of the assessment and site remediation, the site was divided into 38 separate cells that were individually sampled and assessed.

The development is being completed in two phases. Phase I of the North Star development consists of two contiguous tax lots (lots 701 and 1000) and a portion of the third tax lot (lot 200) located on the east portion of the North Star site. The work documented in this report involves removal of dieldrin-contaminated soil in portions or all of sample cells #8, 9, 10, 13, 14, 15 and 33, located in tax lots 701 and 1000. No dieldrin-contaminated soil is being removed from tax lot 200 in Phase I of the project.

The land between the residential lots on the north side of Constellation Avenue and the north boundary of the North Star development (Phase 1) will be deeded to the City of Salem and used for a storm water drainage swale for the development. The storm water plan has not yet been formally approved, however the City of Salem's Chief Facilities Design Engineer, Glen Davis, P.E., has indicated their preference that the land be deeded to the city.

The drainage swale will be a linear feature located below the power lines. The swale is designed to be a combination of storm water storage and conveyance, ultimately discharging to the ditch located on the west end of the Phase I development.

Remediation of North Star Phase II, which will include all of tax lots 600 and 900, and the remaining area of lot 200, is planned to commence in spring, 2018.

1.2 PROJECT OBJECTIVES

The purpose of the soil removal was to reduce the risk of human contact with dieldrin-contaminated soil for future residential receptors at the North Star residential development. The objective was to remove the dieldrin-contaminated soil, up to depths of approximately 6-30 inches below ground surface, so that the dieldrin concentration in the remaining soil is below the DEQ's generic residential risk-based concentrations (RBCs) for ingestion, dermal contact and inhalation (0.034 milligrams per kilogram – mg/kg).

After the successful completion of the removal of the affected topsoil, the site could be re-graded, areas filled with clean fill, and developed with single-family homes. The clean fill is being obtained from other areas of the North Star site that have been tested and found to contain dieldrin below the RBC (0.034 mg/kg).

2.0 BACKGROUND

2.1 SITE HISTORY

The five tax lots that comprise the North Star property were farmed by the Zielinski family and others since the 1890's. According to Doug Zielinski, owner of Alpha Nursery and former lessee of the subject property, his family farmed all portions of the subject property during various periods from the 1890's until 2017. His family grew row crops (beans, corn) in the earlier years and grass and grain crops in recent years. DDT was used on the site for pest control in the 1950's. No areas of the North Star site are currently being farmed.

A previous owner of tax lot 900 reportedly grew strawberries on the lot in the late 1950's and early 1960's. According to Doug Zielinski, the pesticide aldrin, which naturally breaks down to dieldrin, was used on the strawberry crop. Other row crops grown on tax lot 900 and 600 included green beans and cauliflower. Two areas on the north half of tax lot 200 and one area on the west half of tax lot 1000 were planted in filberts beginning in the 1940's until the trees were removed in the 1980's.

Mr. Zielinski's family sold the land to Granada Land Company in 2005 and leased the land back for farming grass and grain crops from 2005 until spring 2017, when the final crop of wheat was harvested. The property was purchased by I&E Construction in July 2017.

2.2 PREVIOUS INVESTIGATIONS

Northstar Development
Preliminary Soil Analysis
Multi/Tech Engineering Services, Inc.
August 17, 2015

In July 2015, Multi/Tech collected soil samples from locations across the subject property for analysis for residual pesticides. The samples were collected from a depth of approximately 6 inches below ground surface (bgs). The samples were analyzed for organochlorine pesticides (EPA Method 8081B), organophosphorous pesticides (EPA Method 8270D) and heavy metals (RCRA 8 metals). No organophosphorous pesticides were reported above the laboratory reporting limits. The metals were reported at concentrations within natural background levels.

Organochlorine pesticides reported in the samples included 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dieldrin and endosulfan sulfate. Of these compounds, only dieldrin was present above Oregon risk-based concentrations (RBCs) for residential properties.

Dieldrin was detected in seven of the ten soil samples at concentrations ranging from 0.0266 and 0.196 milligrams per kilogram (mg/kg). The dieldrin concentrations exceeded RBCs for the residential ingestion/inhalation/dermal contact exposure pathway in six of these samples.

Northstar Development
Assessment of Pesticides in Shallow Soil
Anderson Geological, Inc.
December 22, 2105

In September 2015, Anderson Geological, Inc. (AGI) collected soil samples from locations across the subject property for analysis for residual pesticides. Samples were collected from depth intervals of 0-6 inches and 6-12 inches below ground surface.

The residual impacts from historical agricultural use of pesticides were evaluated by collecting shallow soil samples across the site. The pesticides aldrin, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, endosulfan sulfate, endrin ketone and dieldrin were detected in composite samples collected from a depth of 0-6 inches. Based on the comparison of the sample results of the initial sampling to the residential RBCs, dieldrin was identified as the only contaminant of concern (COC). Further analysis of deeper samples showed dieldrin at concentrations above residential screening levels for the *dermal contact, ingestion, inhalation* pathway in several areas to depths of at least 12 inches. The maximum depth of the impacted soil was not determined in many areas. Additional characterization of the dieldrin-impacted soils was recommended to identify the depth of soils contaminated above RBCs.

Northstar Development
Remedial Investigation/Feasibility Study
Anderson Geological, Inc.
August 9, 2016

Additional soil sampling ruled out other potential pesticides and metals as contaminants of concern, and further defined the approximate depth of dieldrin-contaminated soil above residential and urban residential screening levels. It was determined that dieldrin-contaminated soil would need to be removed, primarily from locations on the west portion and north extension of the subject property, generally to depths of up to 18 inches.

It was concluded that the most appropriate remedial option for the site was removal of soil that exceed applicable residential risk-based concentrations (soil ingestion, dermal contact and inhalation), and placing the excavated soil in an engineered containment cell on a portion of the North Star site that removes the soil from human contact.

It was later decided that re-use of the soils at an off-site location would be a more economical and practical alternative. The dieldrin contaminated soil will be transported to an agriculture land located at 6848 Windsor Island Road, Keizer, Oregon on Marion County Map and Tax Lot 063W28 00300. The soil will be used to infill two abandoned gravel pits on the property. The soil will be covered with 3 feet of cleaner fill and will be reused as farm land to grow hazelnuts. The off-site disposal of the soils is being done under a Solid Waste Permit Exemption through Oregon DEQ.

2.3 REMEDIATION WORK PLAN

2.3.1 Initial Work Plan

A Remedial Action Work Plan the remediation of the entire 150-acre North Star site was submitted to and approved by Oregon DEQ. The plan provided details of the soil removal, loading of trucks, hauling of soil to the off-site disposal location (Zielinski Farm), confirmation sampling, and decontamination of heavy equipment and sampling equipment.

The disposal of the soil at the Zielinski Farm had been approved by DEQ under a solid waste permit exemption. It was later determined that one of the two disposal pits (“south pit”) was located within the 100-year flood plain and may also contain jurisdictional wetlands. Special permitting for placement of fill in the flood plain would be required, and identification and mitigation of wetlands would be needed before fill could be placed in the pit. The time needed for the permitting and wetland survey was not compatible with the construction schedule, which required commencement of excavation activities by August 1, 2017.

In June, 2017, DEQ solicited public comments to the cleanup. Respondents included nearby residents who were concerned over potential dust generation and public exposure to airborne contaminants. Other concerns involved potential public exposure to dieldrin during transportation of the material on public roadways and potential exposure at the proposed disposal site. The City of Keizer requested an extension

to the comment period, which was due to expire on July 31, 2017.

2.3.2 Revised Work Plan

In order to address these concerns and to complete as much of the remediation and construction as possible in the 2017 construction season, the work was planned to be executed in two phases. Phase I would involve the removal of dieldrin-contaminated soil that exceeds the applicable residential risk standard from the affected cells on the east portion of the North Star site (cells #8, 9, 10, 13, 14, 15, and 33). The dieldrin-contaminated soil was to be temporarily stockpiled in cells 19 and 26, located in the Phase II area of the North Star site. Once the cells on the east portion are remediated, development of the Phase I portion could commence, including filling, grading, trenching, and construction of infrastructure (roadways, buried utilities, etc.). Phase I could begin immediately since it did not involve the removal of any contaminated soils from the project site.

The boundaries of the Phase I and Phase II portions of the site are shown on Figures 2-4.

The stockpiled contaminated soil on cells 19 and 26 would be graded and hydroseeded with a grass mixture mixed with a tackifier to stabilize the soil until spring 2018 when the stockpiled soil would be removed and transported to the Zielinski Farm for disposal in the north pit.

Phase II will involve the removal of 1) stockpiled contaminated soil removed during Phase I, and 2) dieldrin-contaminated soil above the applicable residential RBC from the remaining cells on the west and north portions of the site. The soil will be disposed of at the Zielinski Farm, after the required permits are obtained for placement of the soil in the south pit.

The revised scope of work was described in the Addendum #1 to the Remedial Action Work Plan (August 6, 2017), which included details for maintaining dust control, decontamination of equipment before leaving the site, conducting air monitoring and dust monitoring during excavation and transport activities and constructing and maintaining the soil stockpile. The addendum also included procedures for decontaminating equipment before leaving the job site.

Copies of the Remedial Action Work Plan and the Addendum #1 to the Remedial Action Work Plan are included in Appendix A.

3.0 PURPOSE AND SCOPE

The purpose of the soil removal was to reduce the risk of human contact with dieldrin-impacted soil for future residential receptors. The objective was to remove the shallow soil in specific locations, up to approximately 30 inches below ground surface, so that the dieldrin concentration in the remaining soil is below applicable residential risk-based concentrations (RBCs). After the successful completion of the removal of the affected topsoil, the site will be re-graded and developed with single-family homes.

The scope of work consisted of the following tasks:

- Mark the corners of the sampling grids using surveyor's stakes.
- Remove the topsoil from selected quarter-cells using earth-moving scrapers and excavators to the pre-determined depth, based on the results of the previous soil sampling.
- Collect composite confirmation soil samples from excavated areas to verify the effectiveness of the soil removal. Analyze the composite samples for dieldrin (EPA Method 8081B).
- Remove additional soil from areas where confirmation soil sample indicate dieldrin above risk-based concentrations.
- Prepared this report outlining the results and conclusions of the remediation.

4.0 FIELD ACTIVITIES

4.1 SOIL REMOVAL AND CONFIRMATION SAMPLING

4.1.1 Site Preparation and Soil Removal

For several weeks leading up to the beginning of the soil removal, the ground surface was watered using mobile sprinklers and water trucks to minimize dust generation in the excavation areas. Water was obtained from an elevated water tank near the residence, which was kept filled from a water well located on tax lot 900. All of I&E's trucks and heavy equipment was dedicated to the North Star site, and no equipment left the site without being decontaminated, as describe in the work plan.

A temporary haul road was graded between the excavation areas and the stockpile location, primarily on cells containing dieldrin below the applicable RBC (0.034 mg/kg). The locations of the haul roads are shown on Figure 3. Each quarter cell containing dieldrin above risk-based concentrations was field-marked with stakes and flagging to guide the scrapers.

The scrapers removed and transported the excavated contaminated soil via the haul road directly to the stockpile area where the load was dumped. The scrapers ran between the contaminated cells and the stockpile area on the designated haul roads. Water was continually applied to the ground surface for dust

suppression during scraping, hauling and dumping. The haul road was also kept watered for dust suppression. Upon completion of the removal of all contaminated soil from the Phase I area, the upper 2-3 inches of soil was removed from the haul roads using scrapers and placed in the stockpile. The soil stockpile on cells 19 and 26 was graded and hydroseeded within five days of completion of the soil removal.

AGI was on site for the first two weeks of the excavation to monitor the soil removal and dust suppression activities.

4.1.2 Soil Sampling in Cells

Upon completion of the excavation in each quarter cell, confirmation composite samples were collected. In each quarter cell, eight discrete soil samples were collected to create two composite confirmation samples (four discrete samples per composite sample). This methodology resulted in an average of one discrete soil sample per 5,500 square-foot residential lot. The discrete samples were collected from evenly distributed locations within each sub-cell. The sample collection strategy and sample labeling convention are shown graphically in Figure 5.

Each discrete sample was collected from a depth of 0-3 inches using a hand-operated soil auger and was homogenized in a resalable plastic bag. Composite samples were created from four adjacent discrete samples by placing equal volumes of homogenized discrete samples into the plastic bag and thoroughly blending the sample with a clean, nitrile-gloved hand. The sampling equipment was decontaminated between each composite sample as described in the remediation work plan.

Each composite sample was placed into a labeled 4-ounce glass sample jar which was placed in a chilled cooler and hand-delivered to the project laboratory (Apex Labs, Tigard, Oregon). Portions of each discrete sample was placed in separate 4-ounce glass sample jars and held for possible analysis. The samples were analyzed for dieldrin by EPA Method 8081B, with a minimum reporting limit of 0.007 mg/kg. The holding time for test method EPA 8081B is 14 calendar days. The composite samples were analyzed on turnaround times ranging from 1 to 5 business days.

Any sub-cells in which the composite samples exceeded $\frac{1}{4}$ of the RBC (0.0085 mg/kg) were either excavated an additional 6-12 inches and re-sampled, or the corresponding discrete samples were analyzed to attempt to further define the location of the contaminated soil and reduce the volume of soil to be excavated. All locations in which the discrete sample exceeded the residential RBC (0.034 mg/kg) was excavated an additional 6-12 inches and resampled (discrete analysis). The soil removal and sampling continued in this manner until the residential RBC was achieved.

Some areas of the Phase I development required the placement of fill to increase the ground elevation as part of the site development, including portions of cells 9, 10, 11, 12 and 13. The fill material used in these areas consisted of soil that was scraped from the future streets in cells 12, 13, 14, 15, 30, 31, 32, and 33

(Figure 4). The soil in these areas had been previously tested and contained dieldrin below the applicable residential RBC (0.034 mg/kg). The areas receiving the fill are shown on Figure 4.

The sample results and sample depths are summarized in Tables 1-7. The laboratory reports are included in Appendix C.

4.1.3 Soil Sampling at Base of Electrical Tower (Cell #9)

A 100 foot wide easement exists along the north boundary of the North Star Phase I area (Figures 3, 4, and 6) for high tension power lines operated by Bonneville Power Administration (BPA). The lines are supported by metal towers spaced approximately 1,000 feet apart. One of the towers is located on cell #9, within an area where contaminated soil was removed. The excavation extended to within 8-20 feet of the base of the tower, leaving approximately 1,500 square feet of land beneath and around the tower that could not be removed without jeopardizing the metal structure.

Soil samples were collected from two locations on the edge of the island of residual soil around the tower. Discrete soil samples were collected from depths of 0-6 inches and 6-18 inches bgs using a hand-operated soil auger. The four samples were analyzed for dieldrin. The samples contained dieldrin ranging from 0.0191 to 0.0941 mg/kg.

The sample results and sample depths are summarized in Table 8. The laboratory report is included in Appendix C.

4.2 AIRBORNE ANALYSIS OF DIELDRIN

4.2.1 Calculation of Risk-Based Airborne Concentration

Air monitoring was performed during the first two weeks of soil removal in the contaminated cells to document dieldrin exposure to workers and the general public via airborne dust.

Prior to beginning the air monitoring, a site specific residential risk-based concentration (RBC) for airborne dieldrin was calculated. The published default airborne RBC₁ for dieldrin (0.0006 micrograms per cubic meter - $\mu\text{g}/\text{m}^3$) is based on long-term exposure parameters which did not accurately reflect the conditions at the North Star site. The RBC was re-calculated using exposure parameters (exposure duration, frequency and time) that more accurately reflect the transient nature of the exposure during the excavation activities.

The exposure duration was changed from the default level of 26 years (adults) and 6 years (child) to 0.27 years (14 weeks), the exposure frequency was changed from 350 days/year to 98 days/year, and the

1 From Oregon DEQ document *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites*, Sept. 2003 (revised November 1, 2015)

exposure time was changed from 24 hours/day to 12 hours/day. The resulting, site-specific RBC was calculated to be $0.11 \mu\text{g}/\text{m}^3$ for residential receptors.

4.2.2 Air Monitoring

Exposure air monitoring and general project oversight was conducted by Certified Industrial Hygienists employed by PBS Engineering and Environmental (PBS) between August 7 and August 15, 2017. PBS collected air samples using a combination of high-volume and low-volume vacuum pumps and both pre-weighed filter cassettes and OSHA OVS sample tubes. The filter cassettes were used to collect total airborne dust samples and the OVS sample tubes were used to collect airborne dieldrin samples.

The samples were collected from inside the cabs of various pieces of excavation equipment, from areas immediately adjacent to the excavation, hauling and dumping operations, and from downwind property boundaries.

No dieldrin was reported in the OVS samples above the method reporting limit (0.0021 to $0.0094 \mu\text{g}/\text{m}^3$). The dust concentrations were very low, and the dieldrin levels in the air, based on an assumed dieldrin soil concentration of 1.0 milligrams per kilogram, were calculated to be less than $0.00000056 \mu\text{g}/\text{m}^3$. Based on these results and on PBS' observations during the soil removal, the dieldrin levels were significantly below the RBC and additional air monitoring was not warranted as long as airborne dust levels are controlled.

A copy of the air monitoring report is included in Appendix B.

5.0 CONCLUSIONS

5.1 Residential Lots and Roadways

All of the final confirmation soil samples collected from future residential lots and roadways contained dieldrin below risk-based concentrations (composite samples: $0.0085 \text{ mg}/\text{kg}$, discrete samples $0.034 \text{ mg}/\text{kg}$). All of the areas where the initial proposed excavation depth was 6 inches required excavation to greater depths, ranging from 16 to 24 inches below ground surface (bgs). Two-thirds of the areas where the initial proposed excavation depth was 18 inches required excavation to greater depths, ranging from 24 to 40 inches bgs.

The sample results and sample depths are summarized in Tables 1-7. The laboratory reports are included in Appendix C.

Based on the results of the sampling, none of the remaining soil in the Phase I area of the North Star development contains dieldrin in excess of the residential RBC for ingestion, dermal contact, and inhalation.

5.2 Power Line Tower on Cell #9

The remaining soil around the electrical power line tower on cell #9 contains dieldrin above the applicable residential RBC to a minimum depth of 18 inches. The tower and all of the soil exceeding the applicable residential RBC are located entirely within the existing power line right of way (Figure 6). Vegetation growth around the tower should result in minimal erosion and migration of soils from around the tower to the drainage swale area.

Construction of the sidewalk along the west side of Bayne Street and the excavation of the drainage swale near the tower will require removal of dieldrin-contaminated soil to a depth of approximately 12 inches bgs. These excavated soils should be handled and disposed of in accordance with the remedial action work plan.

The remaining soil containing dieldrin above the residential RBC will be located entirely on the city-owned property, therefore the RBCs for occupational use (0.14 mg/kg), construction workers (1.2 mg/kg) and excavation workers (33 mg/kg) will apply to these soils. The detected concentrations around the tower do not exceed any of these concentrations.

6.0 LIMITATIONS

This report was prepared for I&E Construction, Inc. for Phase I of the North Star development on tax lots 701, 900 and 1000, Map 062W32C, Salem, Oregon. This report is not intended for use by others without written consent from Anderson Geological, Inc. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time the report was prepared. No warranty or other conditions, expressed or implied, should be understood.

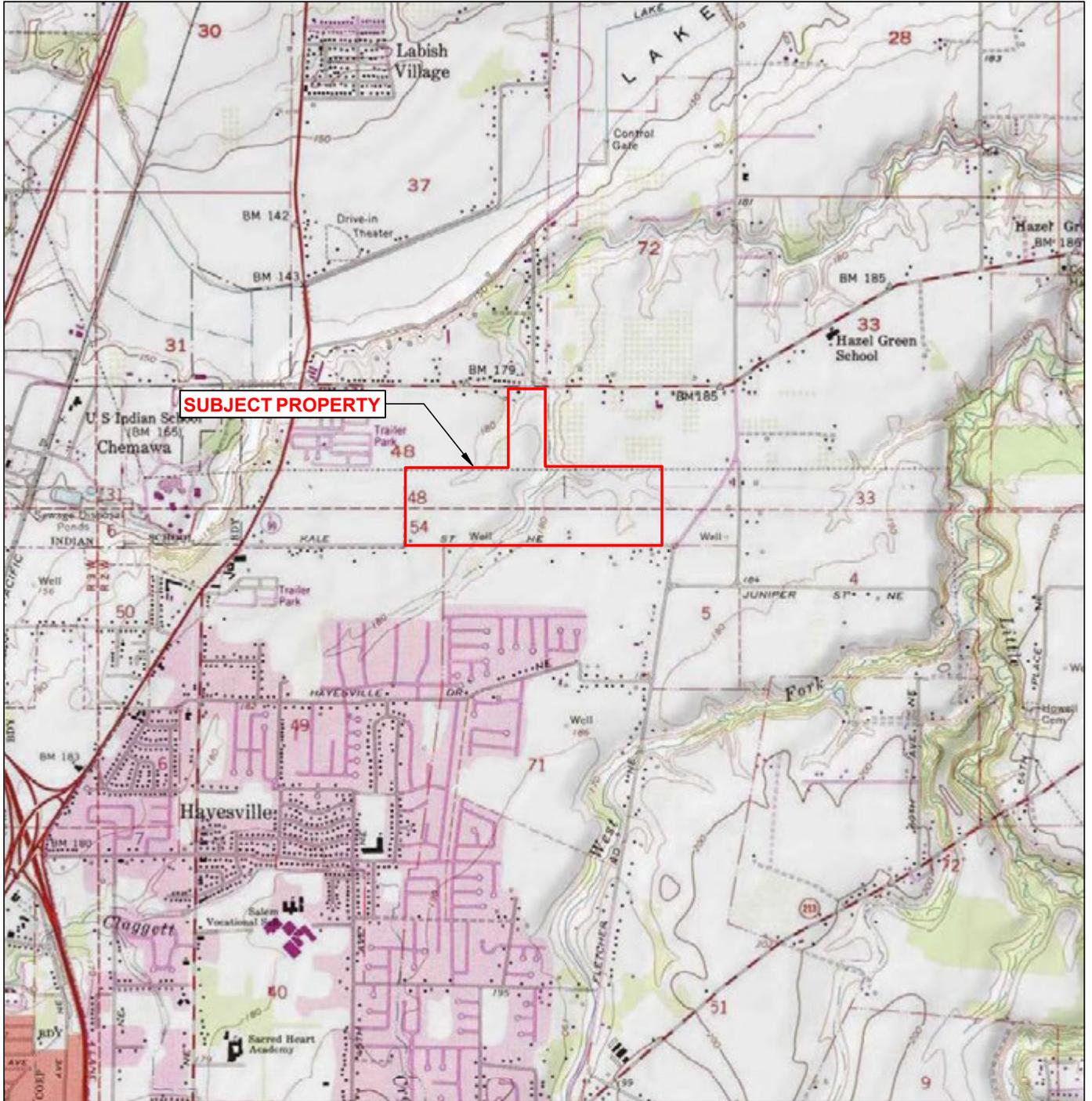
ANDERSON GEOLOGICAL, INC.



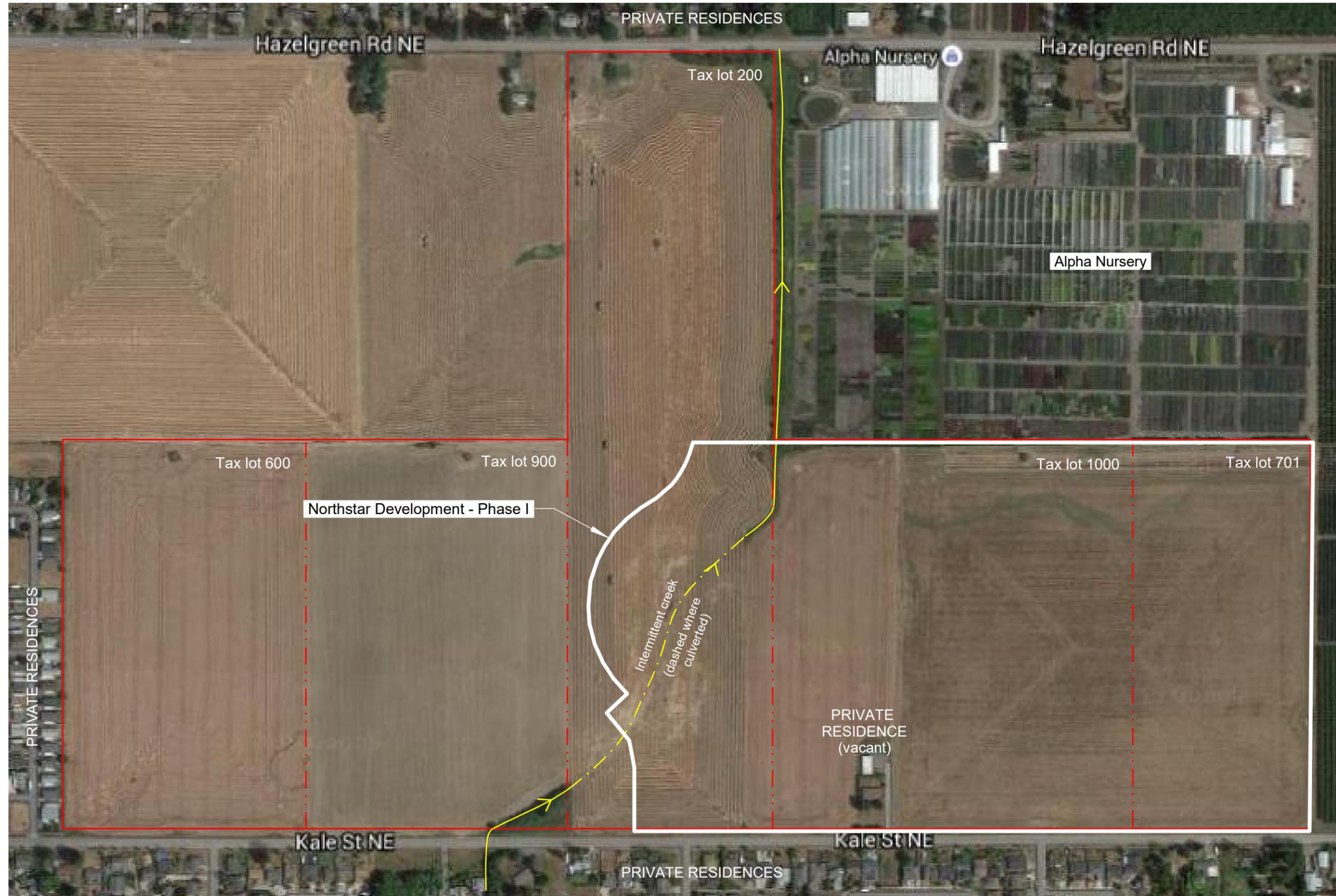
_____ expires 4/01/2018

Erik Anderson, R.G.
Hydrogeologist

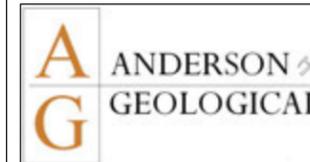
FIGURES



 ANDERSON GEOLOGICAL	SITE LOCATION MAP	
	Northstar Development - Phase I Salem, Oregon	
SIZE A	PROJECT NO. 1503.10	REV 1
	Oct. 2017	FIGURE 1



Scale: 1" = 400' (approximate)



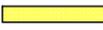
SITE PLAN

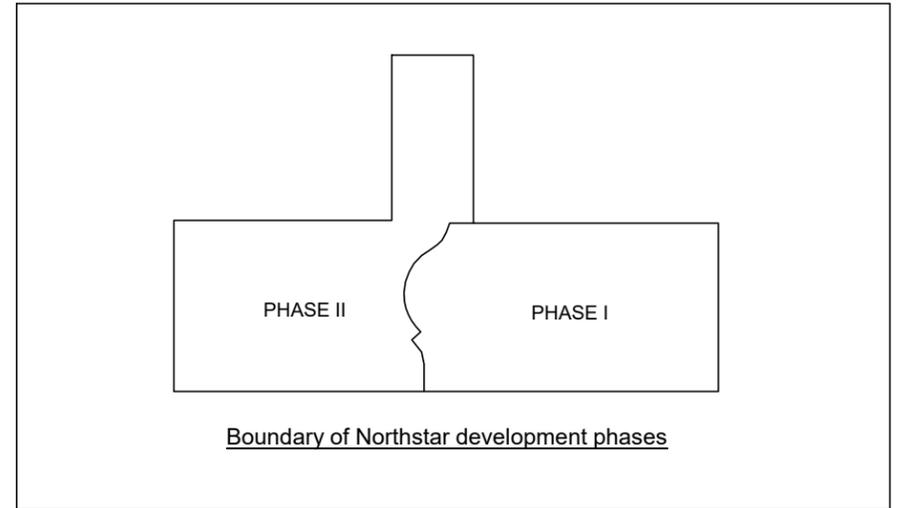
Proposed Northstar Development - Phase I
Salem, Oregon

SIZE	CAGE CODE	DWG NO	PROJECT No.
B		Oct. 2017	FIGURE 2

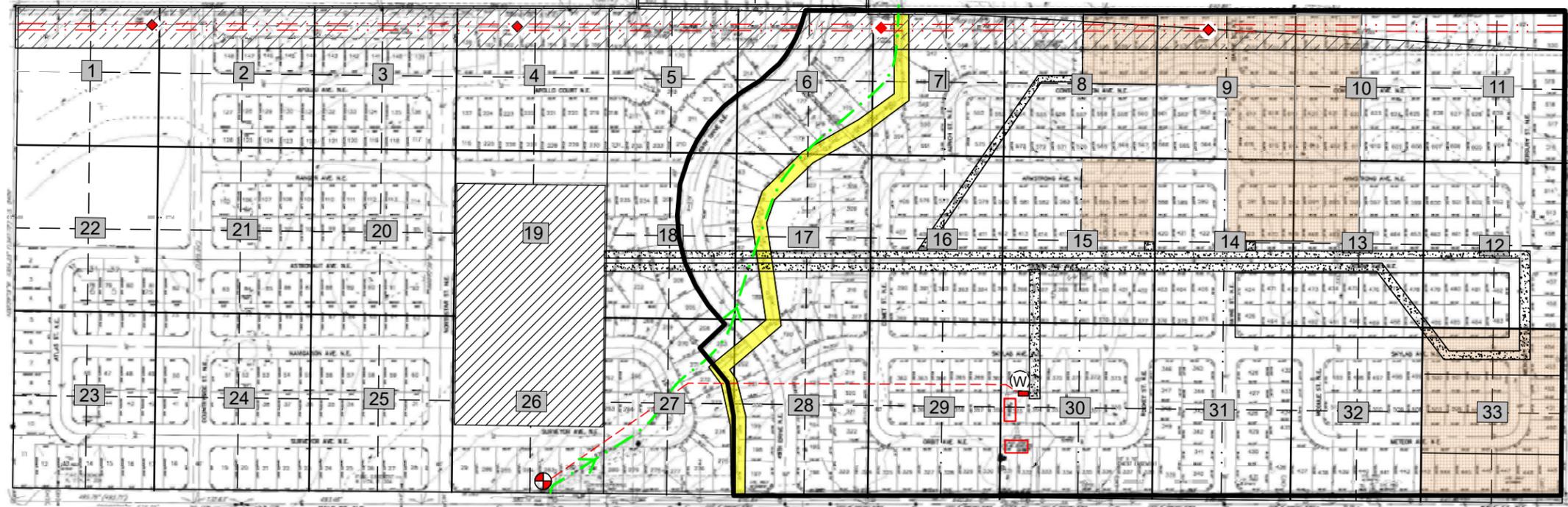


LEGEND

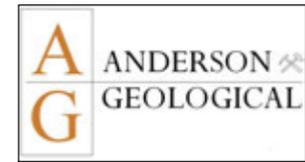
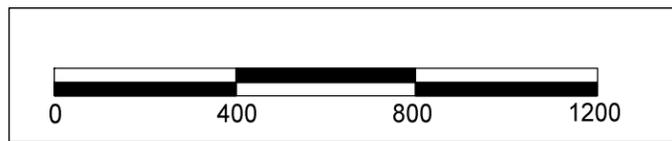
-  Areas where dieldrin-contaminated soil was removed
-  Temporary stockpile for contaminated soil from cells 8, 9, 10, 13, 14, 15 and 33.
-  Power line transmission corridor and future drainage swale, to be deeded to City of Salem
-  Temporary haul road between excavation areas and soil stockpile
-  Future route of open-air ditch
-  Cell number
-  Existing ditch/swale
-  Water well
-  Elevated water tank for storage of dust suppression water
-  Power line tower
-  Power lines



PRIVATE RESIDENCES



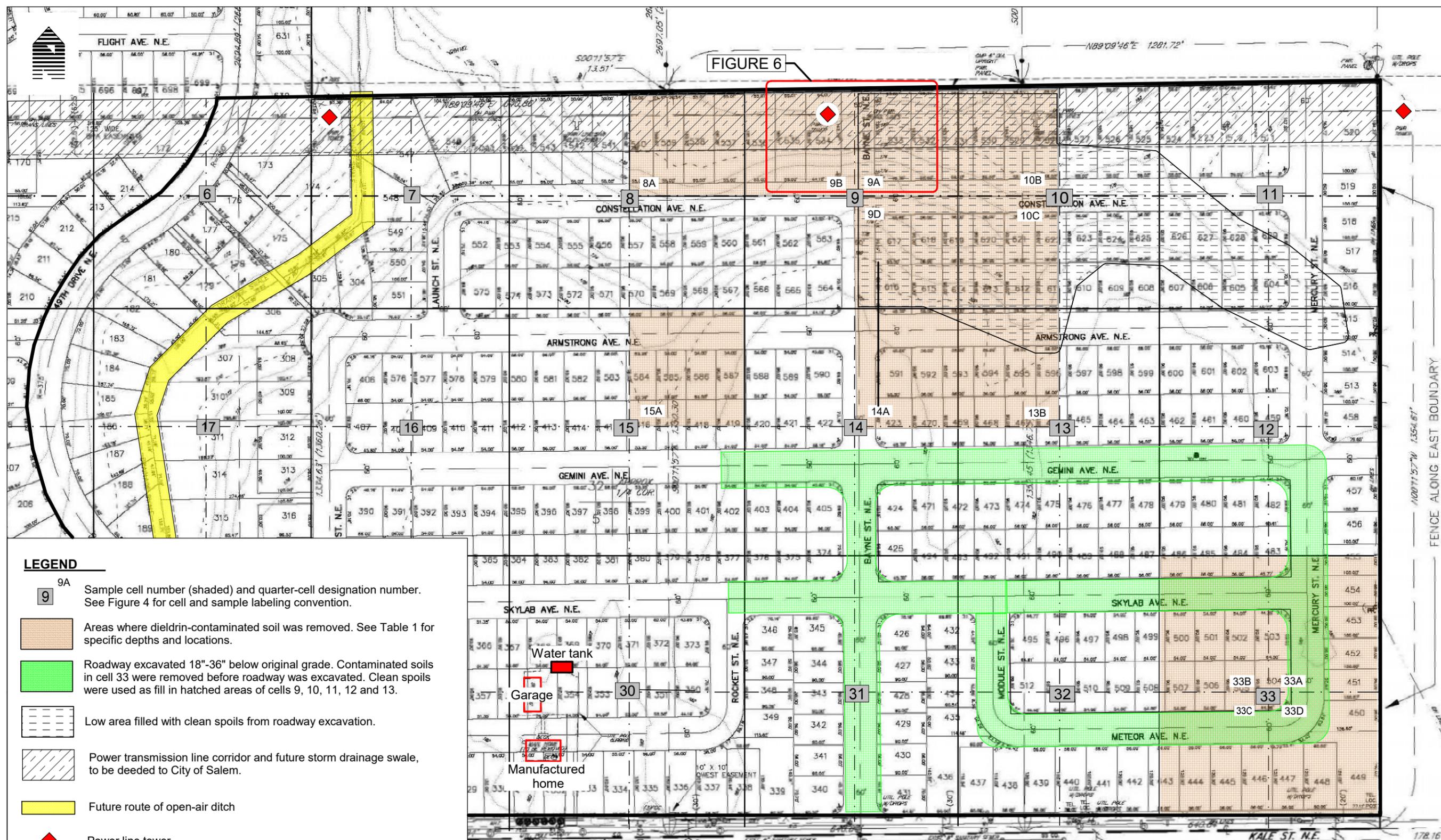
PRIVATE RESIDENCES



EXCAVATED AREAS AND SOIL HAUL ROADS

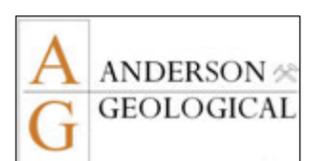
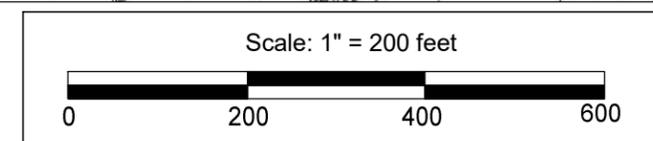
North Star Development - Phase I
Salem, Oregon

SIZE	CAGE CODE	DWG NO	PROJECT No.
B		October 2017	FIGURE 3

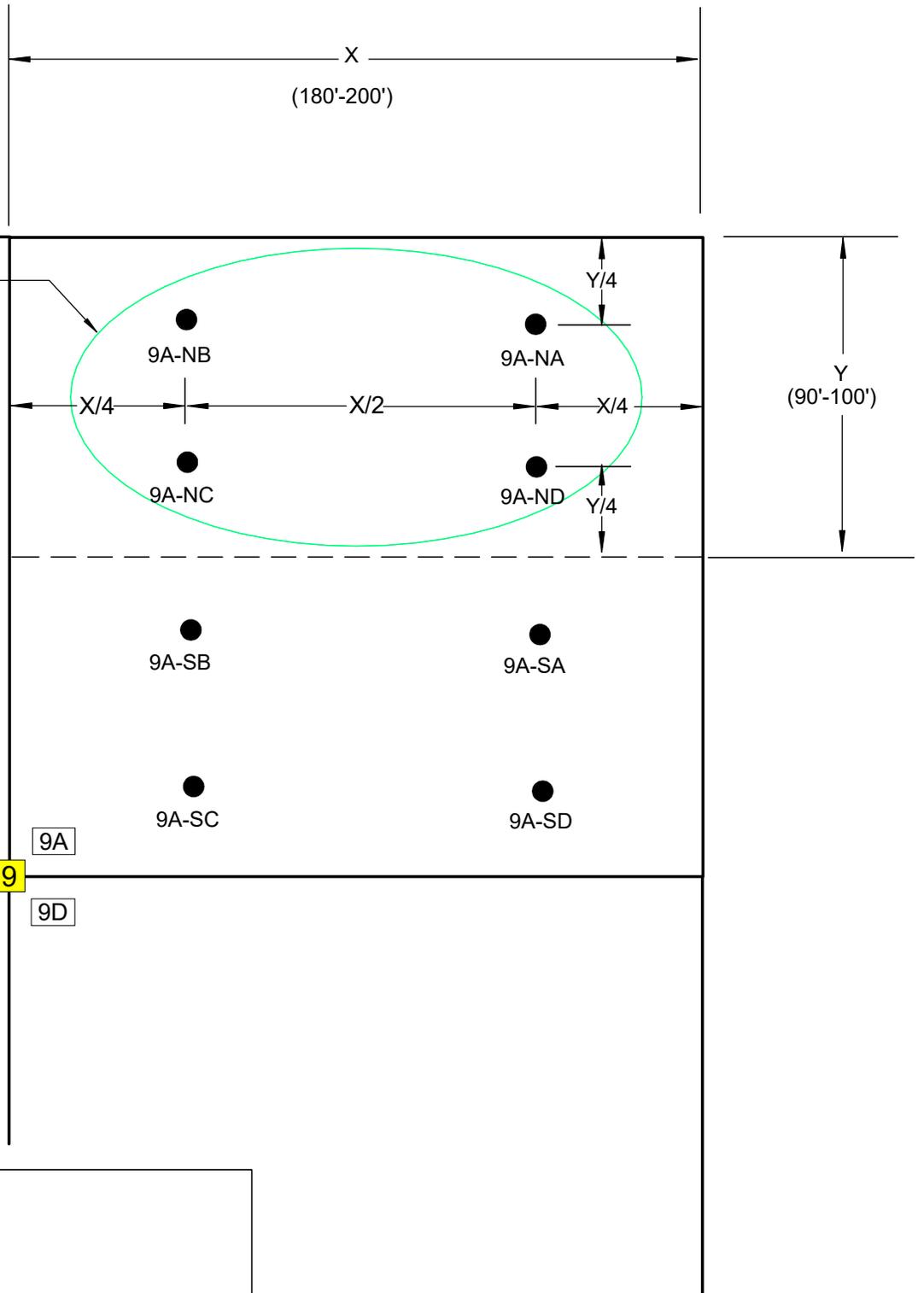


LEGEND

- 9 9A Sample cell number (shaded) and quarter-cell designation number. See Figure 4 for cell and sample labeling convention.
- Areas where dieldrin-contaminated soil was removed. See Table 1 for specific depths and locations.
- Roadway excavated 18"-36" below original grade. Contaminated soils in cell 33 were removed before roadway was excavated. Clean spoils were used as fill in hatched areas of cells 9, 10, 11, 12 and 13.
- Low area filled with clean spoils from roadway excavation.
- Power transmission line corridor and future storm drainage swale, to be deeded to City of Salem.
- Future route of open-air ditch
- Power line tower



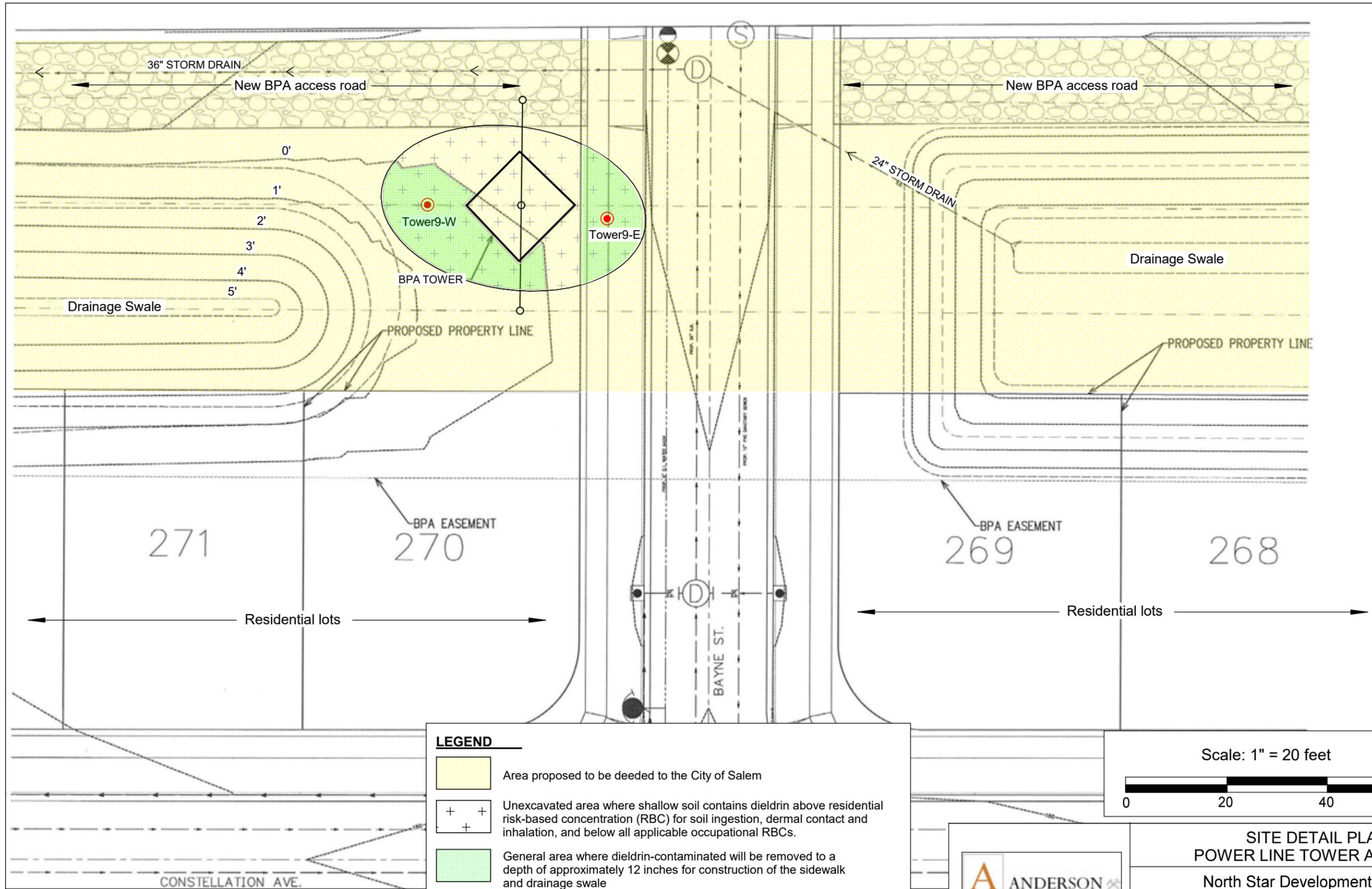
SITE DETAIL PLAN				
North Star Development - Phase I Salem, Oregon				
SIZE	CAGE CODE	DWG NO	PROJECT No.	REV
B			FIGURE 4	
October 2017				



LEGEND

- 9 Sampling cell number
- 9D Quarter cell number
- Discrete sample location
- 9A-SC Discrete sample number. If re-sampled, sample generation is indicated by parentheses [9A-SC(2)]

 ANDERSON GEOLOGICAL	CELL and SAMPLE LABELING CONVENTION		
	Northstar Development - Phase I Salem, Oregon		
	SIZE A	PROJECT NO. 1503.10	REV 1
	OCT. 2017	FIGURE 5	

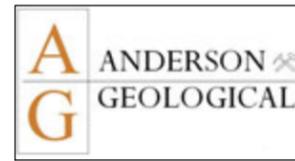


Base map from Multi/Tech Engineering

LEGEND

- Area proposed to be deeded to the City of Salem
- Unexcavated area where shallow soil contains dieldrin above residential risk-based concentration (RBC) for soil ingestion, dermal contact and inhalation, and below all applicable occupational RBCs.
- General area where dieldrin-contaminated will be removed to a depth of approximately 12 inches for construction of the sidewalk and drainage swale
- 3' General depth of excavation for storm water swale
- Tower9-E Soil sample collected from hand-augered boring, and sample number

Scale: 1" = 20 feet



SITE DETAIL PLAN - POWER LINE TOWER AT CELL #9				
North Star Development - Phase I Salem, Oregon				
SIZE B	CAGE CODE	DWG NO	PROJECT No.	REV
		October 2017	FIGURE 6	

TABLES

Table 1
Soil Analysis Summary - Cell 8
Northstar Development

CELL 8					
Quarter Cell	North/South half of quarter cell?	Sample type	Sample Number	Sample Depth (in.*)	Pesticides
					Dieldrin
Northeast Corner (8A)	North (8A-N)	Composite	8A-N-COMP	6	0.0757
			8A-N-COMP (2)	18	<0.00106
		Discrete	8A-NA	6	–
			8A-NB	6	–
			8A-NC	6	–
	South (8A-S)	Composite	8A-S-COMP	6	0.0271
			8A-S-COMP (2)	18	<0.00107
		Discrete	8A-SA	6	–
			8A-SB	6	–
			8A-SC	6	–
8A-SD	6	–			
Residential Screening Levels (Soil Ingestion, Dermal contact, Inhalation)					
Screening Level - Composite Samples					0.0085
Screening Level - Discrete Samples					0.034

Generic Risk-Based Levels are based on Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ, Sept., 2003 (revised November 1, 2015)

All values in milligrams per kilogram (mg/kg)

– Sample not analyzed

Sample result used for final compliance [<0.0085 (composite) and <0.034 (discrete)]

*Sample depth is in inches below original ground surface (approximate)

Sample numbers that have a numeral in parentheses, such as (2) or (3), represent a second (2) or third (3) sample collected from successive depths in the same location.

Table 2
Soil Analysis Summary - Cell 9
Northstar Development

CELL 9					
Quarter Cell	North/South half of quarter cell?	Sample type	Sample Number	Sample Depth (in.*)	Pesticides
					Dieldrin
Northeast Corner (9A)	North (9A-N)	Composite	9A-N-COMP	18	0.0521
			9A-N-COMP (2)	30	<0.00123
		Discrete	9A-NA	-	-
			9A-NB	-	-
			9A-NC	-	-
	South (9A-S)	Composite	9A-S-COMP	18	0.0710
			9A-S-COMP (2)	30	0.0815
			9A-S-COMP (3)	40	<0.00122
		Discrete	9A-SA	-	-
			9A-SB	-	-
Northwest Corner (9B)	North (9B-N)	Composite	9B-N-COMP	18	0.0384
			9B-N-COMP (2)	30	0.00248
		Discrete	9B-NA	-	-
			9B-NB	-	-
			9B-NC	-	-
	South (9B-S)	Composite	9B-S-COMP	18	0.0701
			9B-S-COMP (2)	30	<0.00103
		Discrete	9B-SA	-	-
			9B-SB	-	-
			9B-SC	-	-
Southeast Corner (9D)	North (9D-N)	Composite	9D-N-COMP	6	0.0968
			9D-N-COMP (2)	18	0.167
			9D-N-COMP (3)	30	<0.00112
		Discrete	9D-NA	-	-
			9D-NB	-	-
	South (9D-S)	Composite	9D-S-COMP	6	0.0717
			9D-S-COMP (2)	18	0.00221
		Discrete	9D-SA	-	-
			9D-SB	-	-
			9D-SC	-	-
Residential Screening Levels (Soil Ingestion, Dermal contact, Inhalation)					
Screening Level - Composite Samples					0.0085
Screening Level - Discrete Samples					0.034

Generic Risk-Based Levels are based on Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ, Sept., 2003 (revised November 1, 2015)

All values in milligrams per kilogram (mg/kg)

- Sample not analyzed

Sample result used for final compliance [<0.0085 (composite) and <0.034 (discrete)]

*Sample depth is in inches below original ground surface (approximate)

Sample numbers that have a numeral in parentheses, such as (2) or (3), represent a second (2) or third (3) sample collected from successive depths in the same location.

Table 3
Soil Analysis Summary - Cell 10
Northstar Development

CELL 10					
Quarter Cell	North/South half of quarter cell?	Sample type	Sample Number	Sample Depth (in.*)	Pesticides
					Dieldrin
Northwest Corner (10B)	North (10B-N)	Composite	10B-N-COMP	18	0.00518
		Discrete	10B-NA	18	–
			10B-NB	18	–
			10B-NC	18	–
			10B-ND	18	–
	South (10B-S)	Composite	10B-S-COMP	18	<0.00116
		Discrete	10B-SA	18	–
			10B-SB	18	–
			10B-SC	18	–
			10B-SD	18	–
Southwest Corner (10C)	North (10C-N)	Composite	10C-N-COMP	18	0.0342
		Discrete	10C-NA	18	0.00148
			10C-NB	18	0.0237
			10C-NC	18	0.0753
			10C-NC(2)	28	<0.0011
			10C-ND	18	0.0833
	10C-ND(2)	28	<0.00115		
	South (10C-S)	Composite	10C-S-COMP	18	0.00439
		Discrete	10C-SA	18	–
			10C-SB	18	–
10C-SC			18	–	
10C-SD	18	–			
Residential Screening Levels (Soil Ingestion, Dermal contact, Inhalation)					
Screening Level - Composite Samples					0.0085
Screening Level - Discrete Samples					0.034

Generic Risk-Based Levels are based on Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ, Sept., 2003 (revised November 1, 2015)

All values in milligrams per kilogram (mg/kg)

– Sample not analyzed

Sample result used for final compliance [<0.0085 (composite) and <0.034 (discrete)]

*Sample depth is in inches below original ground surface (approximate)

Sample numbers that have a numeral in parentheses, such as (2) or (3), represent a second (2) or third (3) sample collected from successive depths in the same location.

Table 4
Soil Analysis Summary - Cell 13
Northstar Development

CELL 13					
Quarter Cell	North/South half of quarter cell?	Sample type	Sample Number	Sample Depth (in.*)	Pesticides
					Dieldrin
Northwest Corner (13B)	North (13B-N)	Composite	13B-N-COMP	6	0.0432
			13B-N-COMP(2)	18	0.0190
			13B-N-COMP(3)	24	0.0331
			13B-N-COMP(4)	30	<0.00115
	Discrete	13B-NA	6	–	
		13B-NB	6	–	
		13B-NC	6	–	
		13B-ND	6	–	
	South (13B-S)	Composite	13B-S-COMP	6	0.0361
			13B-SA	6	0.0253
		Discrete	13B-SB	6	0.0526
			13B-SB(2)	18	–
			13B-SB(3)	24	0.00128
			13B-SC	6	0.0718
13B-SC(2)	18	–			
13B-SC(3)	24	<0.00105			
13B-SD	6	0.0328			
Residential Screening Levels (Soil Ingestion, Dermal contact, Inhalation)					
Screening Level - Composite Samples					0.0085
Screening Level - Discrete Samples					0.034

Generic Risk-Based Levels are based on Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ, Sept., 2003 (revised November 1, 2015)

All values in milligrams per kilogram (mg/kg)

– Sample not analyzed

Sample result used for final compliance [<0.0085 (composite) and <0.034 (discrete)]

*Sample depth is in inches below original ground surface (approximate)

Sample numbers that have a numeral in parentheses, such as (2) or (3), represent a second (2) or third (3) sample collected from successive depths in the same location.

Table 5
Soil Analysis Summary - Cell 14
Northstar Development

CELL 14					
Quarter Cell	North/South half of quarter cell?	Sample type	Sample Number	Sample Depth (in.*)	Pesticides
					Dieldrin
Northeast Corner (14A)	North (14A-N)	Composite	14A-N-COMP	6	0.0418
			14A-N-COMP (2)	18	0.0228
			14A-N-COMP (3)	24	<0.00113
		Discrete	14A-NA	6	–
			14A-NB	6	–
			14A-NC	6	–
	South (14A-S)	Composite	14A-S-COMP	6	0.0272
			14A-S-COMP (2)	18	0.00355
		Discrete	14A-SA	6	0.0279
			14A-SB	6	0.0452
			14A-SC	6	0.0343
			14A-SD	6	0.0565
Residential Screening Levels (Soil Ingestion, Dermal contact, Inhalation)					
Screening Level - Composite Samples					0.0085
Screening Level - Discrete Samples					0.034

Generic Risk-Based Levels are based on Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ, Sept., 2003 (revised November 1, 2015)

All values in milligrams per kilogram (mg/kg)

– Sample not analyzed

Sample result used for final compliance [<0.0085 (composite) and <0.034 (discrete)]

*Sample depth is in inches below original ground surface (approximate)

Sample numbers that have a numeral in parentheses, such as (2) or (3), represent a second (2) or third (3) sample collected from successive depths in the same location.

Table 6
Soil Analysis Summary - Cell 15
Northstar Development

CELL 15					
Quarter Cell	North/South half of quarter cell?	Sample type	Sample Number	Sample Depth (in.*)	Pesticides
					Dieldrin
Northeast Corner (15A)	North (15A-N)	Composite	15A-N-COMP	6	0.0118
		Discrete	15A-NA	6	<0.0010
			15A-NB	6	0.00987
			15A-NC	6	0.0144
			15A-ND	6	0.0625
			15A-ND(2)	12	0.00149
	South (15A-S)	Composite	15A-S-COMP	6	0.0198
		Discrete	15A-SA	6	0.0475
			15A-SA(2)	12	<0.00106
			15A-SB	6	0.00732
			15A-SC	6	0.00647
			15A-SD	6	0.0576
			15A-SD(2)	12	<0.00111
			Residential Screening Levels (Soil Ingestion, Dermal contact, Inhalation)		
Screening Level - Composite Samples					0.0085
Screening Level - Discrete Samples					0.034

Generic Risk-Based Levels are based on Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ, Sept., 2003 (revised November 1, 2015)

All values in milligrams per kilogram (mg/kg)

– Sample not analyzed

Sample result used for final compliance [<0.0085 (composite) and <0.034 (discrete)]

*Sample depth is in inches below original ground surface (approximate)

Sample numbers that have a numeral in parentheses, such as (2) or (3), represent a second (2) or third (3) sample collected from successive depths in the same location.

Table 7
Soil Analysis Summary - Cell 33
Northstar Development

CELL 33					
Quarter Cell	North/South half of quarter cell?	Sample type	Sample Number	Sample Depth (in.*)	Pesticides
					Dieldrin
Northeast Corner (33A)	North (33A-N)	Composite	33A-N-COMP	18	0.00857
			33A-N-COMP (2)	28	<0.00110
		Discrete	33A-NA	-	-
			33A-NB	-	-
			33A-NC	-	-
	South (33A-S)	Composite	33A-S-COMP	18	0.00787
			33A-SA	-	-
		Discrete	33A-SB	-	-
			33A-SC	-	-
			33A-SD	-	-
Northwest Corner (33B)	North (33B-N)	Composite	33B-N-COMP	6	0.0224
			33B-N-COMP (2)	16	<0.00107
		Discrete	33B-NA	-	-
			33B-NB	-	-
			33B-NC	-	-
	South (33B-S)	Composite	33B-S-COMP	6	0.0320
			33B-S-COMP (2)	16	<0.0010
		Discrete	33B-SA	-	-
			33B-SB	-	-
			33B-SD	-	-
Southwest Corner (33C)	North (33C-N)	Composite	33C-N-COMP	18	0.0069
			33C-NA	-	-
		Discrete	33C-NB	-	-
			33C-NC	-	-
			33C-ND	-	-
	South (33C-S)	Composite	33C-S-COMP	18	<0.00106
			33C-SA	-	-
		Discrete	33C-SB	-	-
			33C-SC	-	-
			33C-SD	-	-
Southeast Corner (33D)	North (33D-N)	Composite	33D-N-COMP	18	<0.0114
			33D-NA	-	-
		Discrete	33D-NB	-	-
			33D-NC	-	-
			33D-ND	-	-
	South (33D-S)	Composite	33D-S-COMP	18	0.0197
			33D-SA	18	0.00411
		Discrete	33D-SB	18	<0.000957
			33D-SC	18	<0.000980
			33D-SD	18	0.0933
		33D-SD(2)	24	<0.00113	
Residential Screening Levels (Soil Ingestion, Dermal contact, Inhalation)					
Screening Level - Composite Samples					0.0085
Screening Level - Discrete Samples					0.034

Generic Risk-Based Levels are based on Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ, Sept., 2003 (revised November 1, 2015)

All values in milligrams per kilogram (mg/kg)

- Sample not analyzed

Sample result used for final compliance [<0.0085 (composite) and <0.034 (discrete)]

*Sample depth is in inches below original ground surface (approximate)

Sample numbers that have a numeral in parentheses, such as (2) or (3), represent a second (2) or third (3) sample collected from successive depths in the same location.

Table 8
Soil Analysis Summary - Base of Power Line Tower, Cell #9
Northstar Development

POWER LINE TOWER - CELL #9			
Sample Number	Sample type	Sample Depth (in.*)	Pesticides
			Dieldrin
Tower 9-E6	Discrete	0-6	0.0612**
Tower9-E18		6-18	0.0191
Tower 9-W6		0-6	0.0941**
Tower9-W18		6-18	0.0447**
Residential Screening Levels (Soil Ingestion, Dermal contact, Inhalation)			
Screening Level - Discrete Samples			0.034

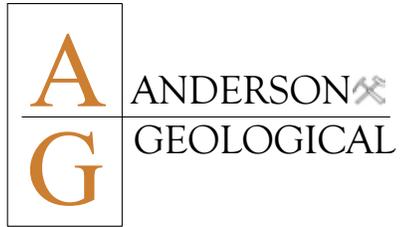
Generic Risk-Based Levels are based on Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites, Oregon DEQ, Sept., 2003 (revised November 1, 2015)

All values in milligrams per kilogram (mg/kg)

*Sample depth is in inches below ground surface (approximate)

** Concentration exceeds residential RBC

APPENDIX A
Remedial Action Work Plan
and Remedial Action Work Plan Addendum



REMEDIAL ACTION WORK PLAN

**PROPOSED NORTH STAR DEVELOPMENT
TAX LOTS 200, 701, 800, 900 AND 1000
MAP 062W32C
SALEM, OREGON
DEQ ECSI #6036**

Prepared for

GRANADA LAND CO., L.L.C.

P.O. Box 649
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(503) 682-2500

Project #1503.00
March 28, 2017

REMEDIAL ACTION WORK PLAN

Proposed North Star Development
Tax Lots 200, 701, 800, 900 and 1000
Map 062W32C
Salem, Oregon

Prepared for

Granada Land Co., L.L.C.

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1.0 INTRODUCTION

Anderson Geological, Inc. (AGI) was authorized by Granada Land Co. L.L.C., to complete this work plan detailing the removal and off-site disposal of shallow soils on tax lots 200, 701, 800, 900 and 1000, Map 062W32C, Salem, Oregon (Subject Property). Areas of the site include soils with dieldrin concentrations that exceed risk-based levels for residential and urban residential (multi-family) property use. A residential development consisting mainly of single-family homes with some multi-family housing is planned for future development of the property.

The site is located within the Salem city limits and domestic water will be supplied to the new development by the City of Salem. No water wells will be in use within the North Star development.

A remedial investigation/feasibility study was completed and approved by the Oregon Department of Environmental Quality (DEQ) that evaluated the risk posed to current and future occupants of the property and proposed a remedial action involving the removal of the dieldrin-impacted soil from portions of the site. The RI/FS had proposed that the excavated soils be disposed of in a dedicated, engineered containment cell adjacent to the North Star development that would prevent human contact with the soil.

It was later determined that re-use of the soils at an off-site location (6848 Windsor Island Rd N., Keizer, Oregon) would be a more economical and practical alternative. The soils will be used to fill two former gravel pits, and the resulting area will be put into active farmland production by the property owner, who also farms the adjacent land. The off-site disposal of the soils is being completed under a Solid Waste Permit Exemption through Oregon DEQ.

1.1 Site Location and Setting

The Subject Property is located within the city limits of Salem, Oregon (Figure 1). The property is bounded to the north by Alpha Nursery and single-family homes (across Hazelgreen Road NE), to the south by single-family homes (across Kale Street NE), to the east by orchards operated by Alpha Nursery, and to the west by Copper Creek Estates mobile home park. Properties to the north of Hazelgreen Road are in unincorporated Marion County and properties south of Kale Street are located within the Salem city limits. The Subject Property and adjacent properties are shown on Figure 2.

The Subject Property consists of four contiguous tax lots totaling 148.74 acres that was leased, through the last season, as farm land for dry wheat farming. The property was not replanted for the current season. A single-family home is located on tax lot 1000 that is occupied by a renter.

2.0 BACKGROUND

2.1 Site History

The five tax lots that comprise the subject property have been farmed by the Zielinski family and others since the 1890's. According to Doug Zielinski, owner of Alpha Nursery and current lessee of the subject property, his family has been farming parts of the subject property since the 1890's. His family grew row crops (beans, corn) in the earlier years and grass and grain crops in recent years. DDT was used on the site for pest control in the 1950's.

A previous owner of tax lot 900 grew strawberries on the lot in the late 1950's and early 1960's. According to Doug Zielinski, the pesticide aldrin, which naturally breaks down to dieldrin, was used on the strawberry crop. Other row crops grown on tax lot 900 and 600 included green beans and cauliflower. Two areas on the north half of tax lot 200 and one area on the west half of tax lot 1000 were planted in filberts beginning in the 1940's until the trees were removed in the 1980's.

Mr. Zielinski's family sold the land to Granada Land Company in 2005 and has leased the land for farming grass and grain crops since that time. Granada Land Company plans to develop the site into a residential housing development known as North Star. The current development plan consists primarily of single-family home sites with a small area reserved for multi-family residences (apartments).

2.2 Previous Investigations

North Star Development
Preliminary Soil Analysis
Multi/Tech Engineering Services, Inc.
August 17, 2015

In July 2015, Multi/Tech collected soil samples from locations across the subject property for analysis for residual pesticides. The samples were collected from a depth of approximately 6 inches below ground surface (bgs). The samples were analyzed for organochlorine pesticides (EPA Method 8081B), organophosphorous pesticides (EPA Method 8270D) and heavy metals (RCRA 8 metals). No organophosphorous pesticides were reported above the laboratory reporting limits. The metals were reported at concentrations within natural background levels.

Organochlorine pesticides reported in the samples included 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dieldrin and endosulfan sulfate. Of these compounds, only dieldrin was present above Oregon risk-based concentrations (RBCs) for residential properties.

Dieldrin was detected in seven of the ten soil samples at concentrations ranging from 0.0266 and 0.196 milligrams per kilogram (mg/kg). The dieldrin concentrations exceeded RBCs for the residential ingestion/inhalation/dermal contact exposure pathway in six of these samples (0.029 mg/kg).

North Star Development
Assessment of Pesticides in Shallow Soil
Anderson Geological, Inc.
December 22, 2105

In September 2015, Anderson Geological, Inc. (AGI) collected soil samples from locations across the subject property for analysis for residual pesticides. Samples were collected from depth intervals of 0-6 inches and 6-12 inches below ground surface.

The residual impacts from historical agricultural use of pesticides were evaluated by collecting shallow soil samples on across the site. The pesticides aldrin, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, endosulfan sulfate, endrin ketone and dieldrin were detected in composite samples collected from a depth of 0-6 inches. Based on the initial sampling, dieldrin was identified as the only contaminant of concern (COC). Further analysis of the samples showed dieldrin at concentrations above residential screening levels for the *dermal contact, ingestion, inhalation* pathway in several areas to depths of at least 12 inches. The maximum depth of the impacted soil was not determined in many areas. Additional characterization of the dieldrin-impacted soils was recommended to identify the depth of soils contaminated above RBCs.

North Star Development
Remedial Investigation/Feasibility Study
Anderson Geological, Inc.
August 9, 2016

Additional soil sampling ruled out other potential pesticides and metals as contaminants of concern, and further defined the approximate depth of dieldrin-contaminated soil above residential and urban residential screening levels. It was determined that dieldrin-contaminated soil would need to be removed, primarily from locations on the west portion and north extension of the subject property, generally to depths of up to 18 inches.

It was concluded that the most appropriate remedial option for the site was removal of soil that exceed risk-based concentrations and placing the excavated soil in an engineered containment cell that removes the soil from human contact.

It was later decided that re-use of the soils at an off-site location would be a more economical and practical alternative. The off-site disposal of the soils is being done under a Solid Waste Permit Exemption through Oregon DEQ.

3.0 PURPOSE AND SCOPE

The purpose of the proposed soil removal is to reduce the risk of human contact with dieldrin-impacted soil for future residential receptors. The objective is to remove the shallow soil, ranging in depth between 6 and 30 inches below ground surface, so that the dieldrin concentration in the remaining soil is below residential risk-based concentrations (RBCs). After the successful completion of the removal of the affected topsoil, the site will be re-graded and developed with single-family homes.

Based on the results of the previous investigations, there are approximately 81 acres of the site that will require remediation, involving the removal of approximately 150,000 cubic yards of topsoil.

4.0 SOIL REMOVAL PLAN

The only contaminant of concern on the subject property is dieldrin, resulting from the degradation of the pesticide aldrin, which is believed to have been applied to some of the crops on the site in the 1950's and 1960's. The purpose of the proposed soil removal is to reduce the risk to direct contact with the impacted soils by future residential receptors on the site.

Based on the conceptual site model, the only exposure pathway of concern is ingestion/dermal contact/inhalation of contaminants in the soil by occupants of the residential units. The proposed remediation of the site involves the removal of all soil exceeding risk-based concentrations from areas of proposed residential development and relocating the soils off-site on a property that will be used for farming.

The proposed soil removal will proceed as follows:

- A City of Salem grading permit and a DEQ 1200C storm water permit will be obtained before beginning soil removal activities.
- The corners of the sampling cell grids, shown in Figure 3, will be marked in the field with surveyor's stakes to guide the soil removal.
- The topsoil will be removed with earth-moving scrapers and excavation equipment from areas shown on Figure 3. The depth of the removed soil will vary from 6 to 18 inches with the exception of the 1-acre area in sub-cell 3A which will be excavated to a depth of 30 inches below ground surface (bgs). The scraped soils will be placed in trucks and trailers which will deliver the soils to the off-site disposal location on Windsor Island Road, Salem (Zielinski farm).

To assure that the proper depth of soil is removed in all areas, global positioning system (GPS) technology will be used on the excavation equipment. As the soil removal progresses, confirmation soil samples will be collected as described in section 5.0 of this work plan. The locations of the individual confirmation sampling points will be marked in the field.

4.1 Worker Safety

The contractor (currently undetermined) will prepare and implement a site-specific Health and Safety Plan in accordance with OSHA requirements to insure adequate protection for their workers while on North Star site and at the disposal site and to control off-site impacts from hazardous substances.

4.2 Loading and Hauling

Material intended for off-site disposal will be loaded directly onto trucks for transport to the disposal facility located at 6848 Windsor Island Rd. N., Keizer, Oregon. All truck loads will be securely covered before leaving the project site and remained covered during transport of the soil to the disposal area.

4.3 Site Control and Equipment Decontamination

Heavy equipment, including excavators and haul trucks, will arrive at the site free of debris and contamination. Prior to soil removal work, an NPDES Permit will be obtained from DEQ for the total site. The permit application will note the proposed construction entrance for the work.

A staging area will be developed near the point where the trucks will enter the public roadway system. Prior to leaving the construction site, all heavy equipment will have visible soil removed from the wheels, wheel wells, and other exterior areas of the vehicle. Dust and other fine surface residue will not be removed. The same decontamination process will be employed for heavy equipment moving from contaminated cells to non-contaminated cells to avoid cross contamination between cells.

The tracking of soil onto public roadways will be minimized by using standard construction practices, including the use of a trackout pad composed of washed gravel or crushed rock. Trackout will be cleaned up from roadways as needed by using a street sweeper, wet broom or by manual sweeping. Dust generation will be minimized from the construction site by watering of soils as needed during excavation and grading.

The contractor will obtain all necessary permits, including storm water control permits, and follow best management practices to minimize migration of contaminated soils and runoff into sensitive environments.

5.0 POST-REMOVAL SOIL CONFIRMATION SAMPLING

It is expected that approximately 81 acres of land will undergo excavation of dieldrin-contaminated soil and a minimum of 162 composite samples will be collected and analyzed.

Confirmation soil samples will be collected from all areas where dieldrin-contaminated soil was removed to verify the effectiveness of the soil removal. The location of each discrete sample will be recorded using global positioning technology.

The soil removal will be completed within sub-cells with an approximate area of one acre each. In each sub-cell from which contaminated soil has been removed, eight discrete soil samples will be collected to create two composite confirmation samples (four discrete samples per composite sample). This methodology will result in an average of one discrete soil sample per 5,500 square-foot residential lot. The discrete samples will be collected from evenly-distributed locations within each sub-cell (Figure 3). No attempt will be made to locate samples within specific residential lots.

Each discrete sample will be collected from a depth of 0-3 inches using a shovel or hand trowel and homogenized in a resalable plastic bag. Composite samples will be created from four adjacent discrete samples by placing equal volumes of homogenized discrete samples into the plastic bag and thoroughly blending the sample with a clean, nitrile-gloved hand. The resulting composite sample will be placed into a labeled 4-ounce glass sample jar which will be placed in a chilled cooler and hand-delivered to the project laboratory (Apex Labs, Tigard, Oregon). Portions of each discrete sample will be placed in separate 4-ounce glass sample jars and held for possible analysis in the event that the composite sample exceeds $\frac{1}{4}$ of the RBC (see discussion below). The samples will be analyzed for dieldrin by EPA Method 8081B, with a minimum reporting limit of 0.007 mg/kg.

The holding time for test method EPA 8081B is 14 calendar days. The composite samples will be analyzed on a 5 business-day turnaround, giving enough time before the hold time expires to extract and analyze the corresponding discrete samples, as needed.

Any sub-cells in which the composite samples exceed $\frac{1}{4}$ of the RBC (0.0085 mg/kg) will be further evaluated by analyzing the corresponding discrete samples to attempt to further define the location of the contaminated soil and reduce the volume of soil to be excavated. Any locations in which the discrete sample exceeds the residential RBC (0.034 mg/kg) will be further excavated and resampled (discrete analysis) to verify the effectiveness of the soil removal. Soil removal will continue until the residential RBC is achieved.

After completion of the remedial action, the site will be re-graded and clean fill will be imported as needed to restore the site for construction of the housing development.

5.1 Decontamination of Sampling Equipment

All sampling equipment will decontaminated between composite sampling sub-cells by washing the equipment with a detergent wash and rinsing with de-ionized water. The wash water and rinsate is expected to involve a minimal volume of liquid and will be discarded onto the ground in the location of the last discrete sample. The decontamination will be performed before moving to the next sampling sub-cell. Alternatively, the use of dedicated, disposable sampling equipment may be used. All disposable sampling equipment (e.g. nitrile gloves, paper towels, empty plastic bags, etc.) will be disposed of as general construction waste.

6.0 REPORTING

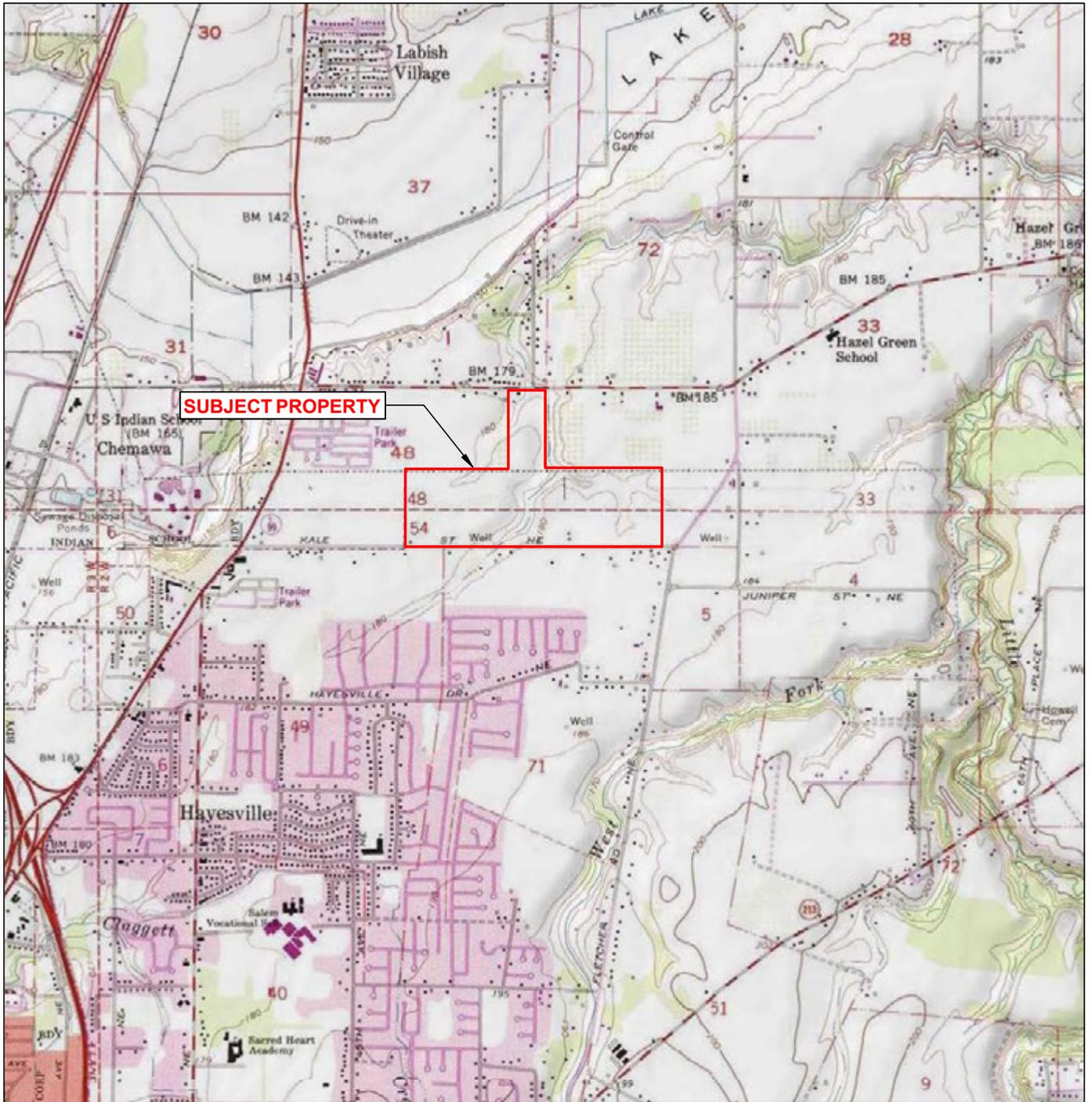
Upon completion of the soil removal and confirmation sampling, a project completion report will be prepared that documents the specific depths and locations of the excavated dieldrin-impacted soil, locations and results of all confirmation soil samples, and evaluation of the lab results with respect to cleanup levels.

ANDERSON GEOLOGICAL, INC.

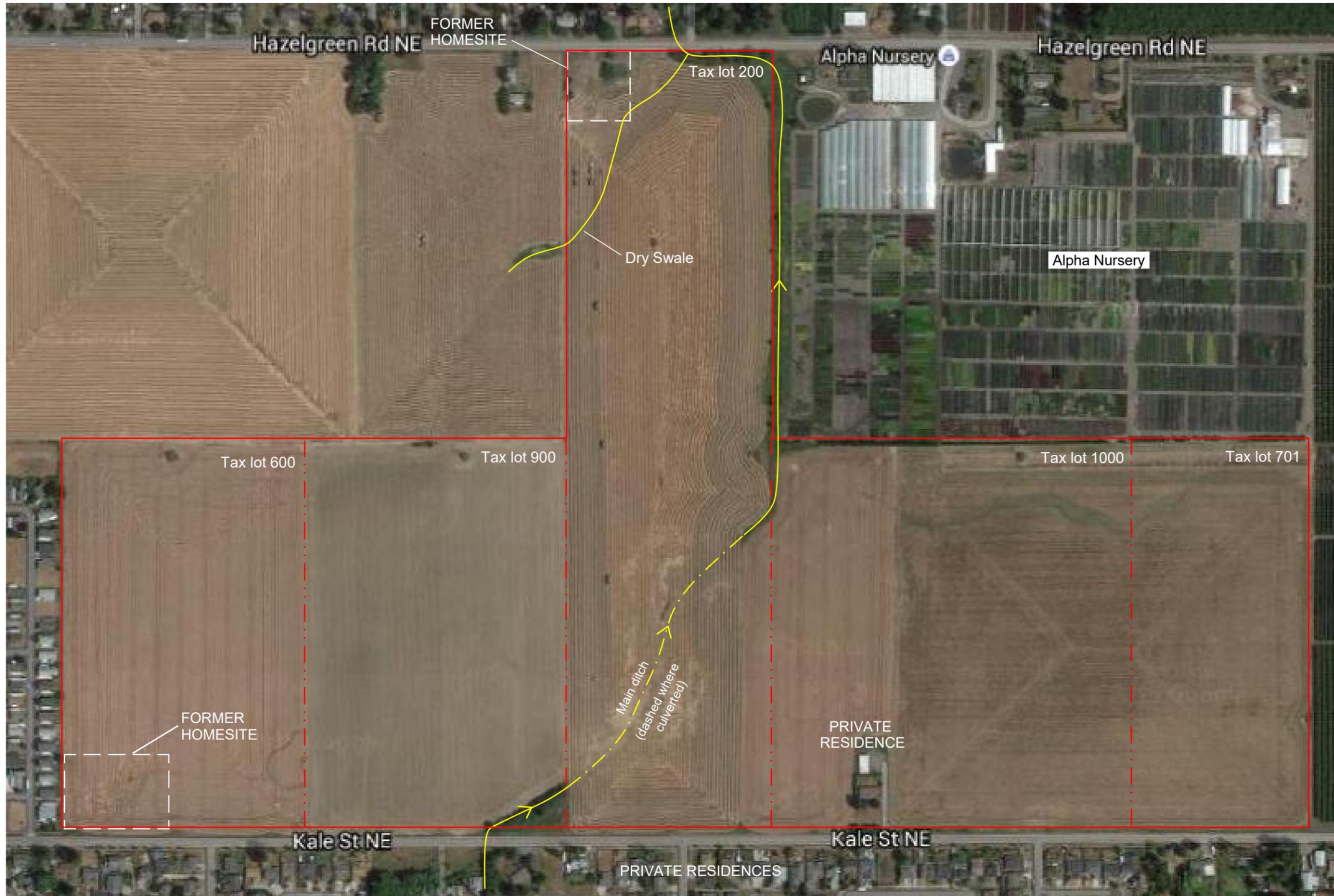


expires 4/1/2018

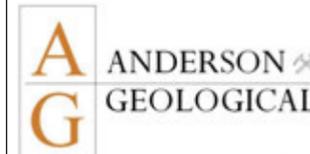
Erik Anderson, R.G.
Registered Geologist



 ANDERSON GEOLOGICAL	SITE LOCATION MAP	
	Tax Lots 200, 701, 800, 900 and 1000, Map 062W32C Salem, Oregon	
	SIZE A	PROJECT NO. 1503.00
	April 2017	FIGURE 1



Scale: 1" = 400' (approximate)



SITE PLAN

Proposed North Star Development
Salem, Oregon

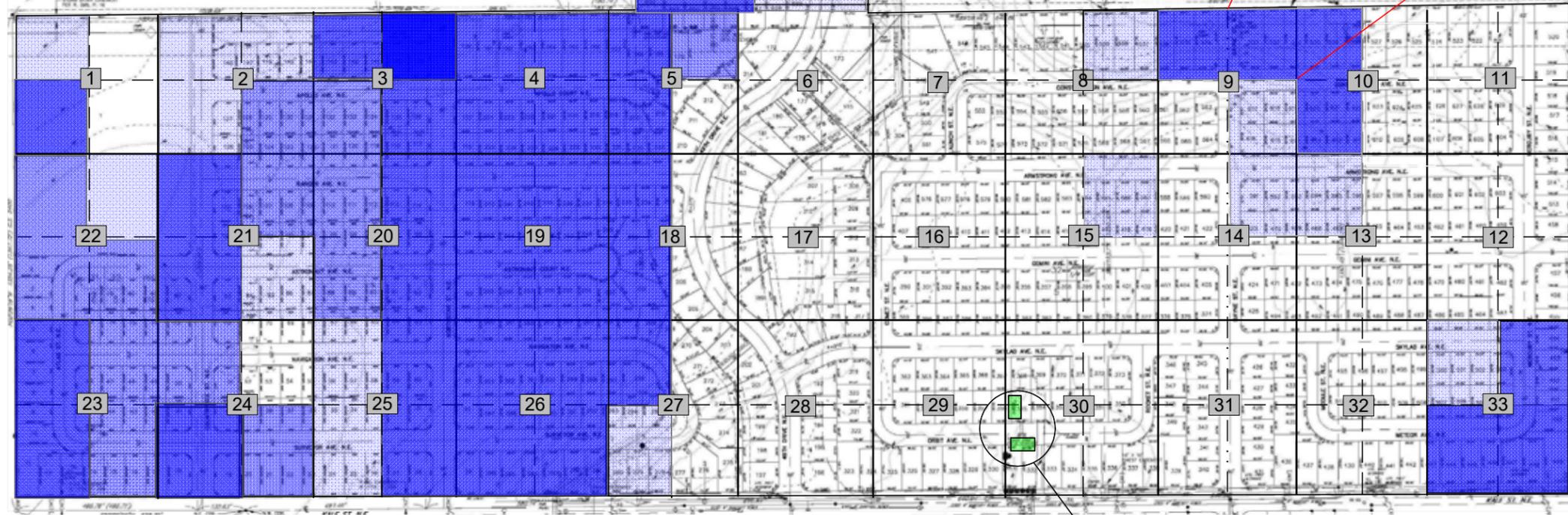
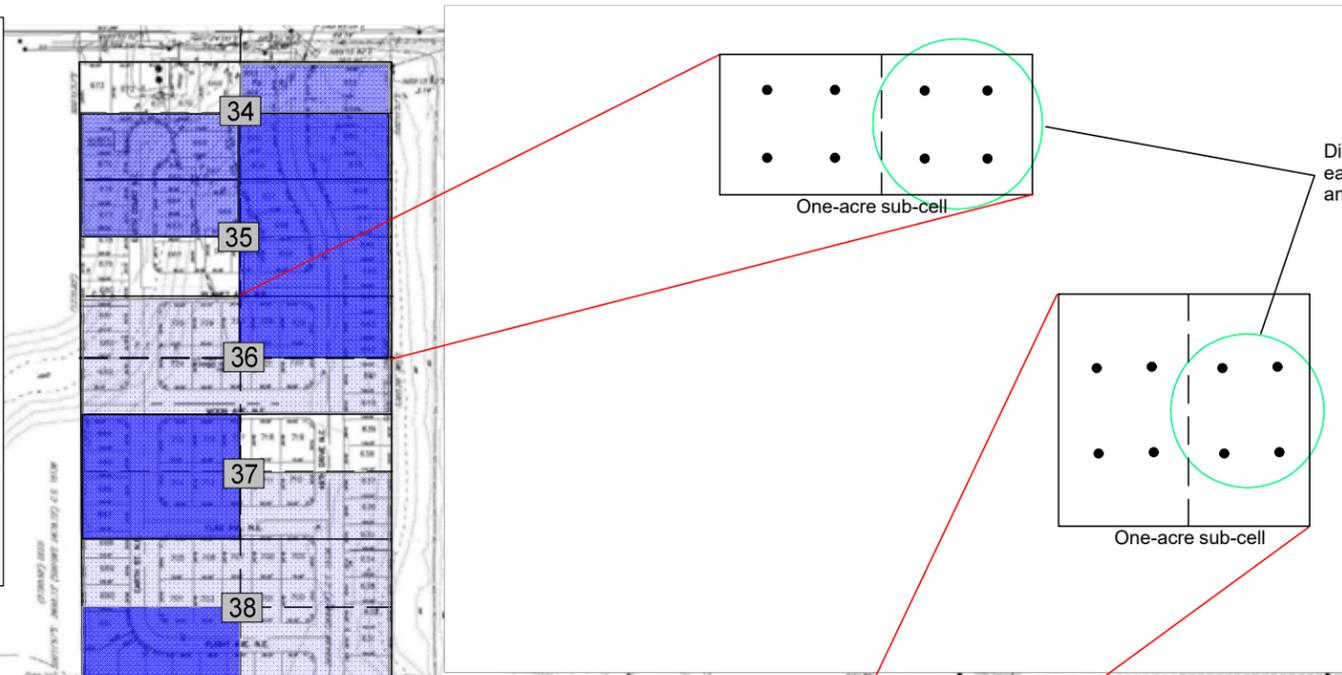
SIZE	CAGE CODE	DWG NO	PROJECT No.
B		April 2017	FIGURE 2



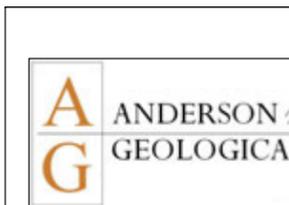
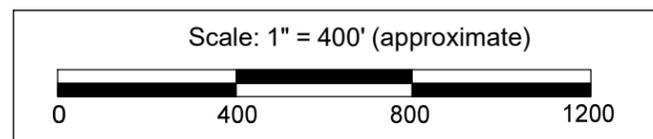
Example of 4-point composite sampling within 1-acre sub-cells

LEGEND

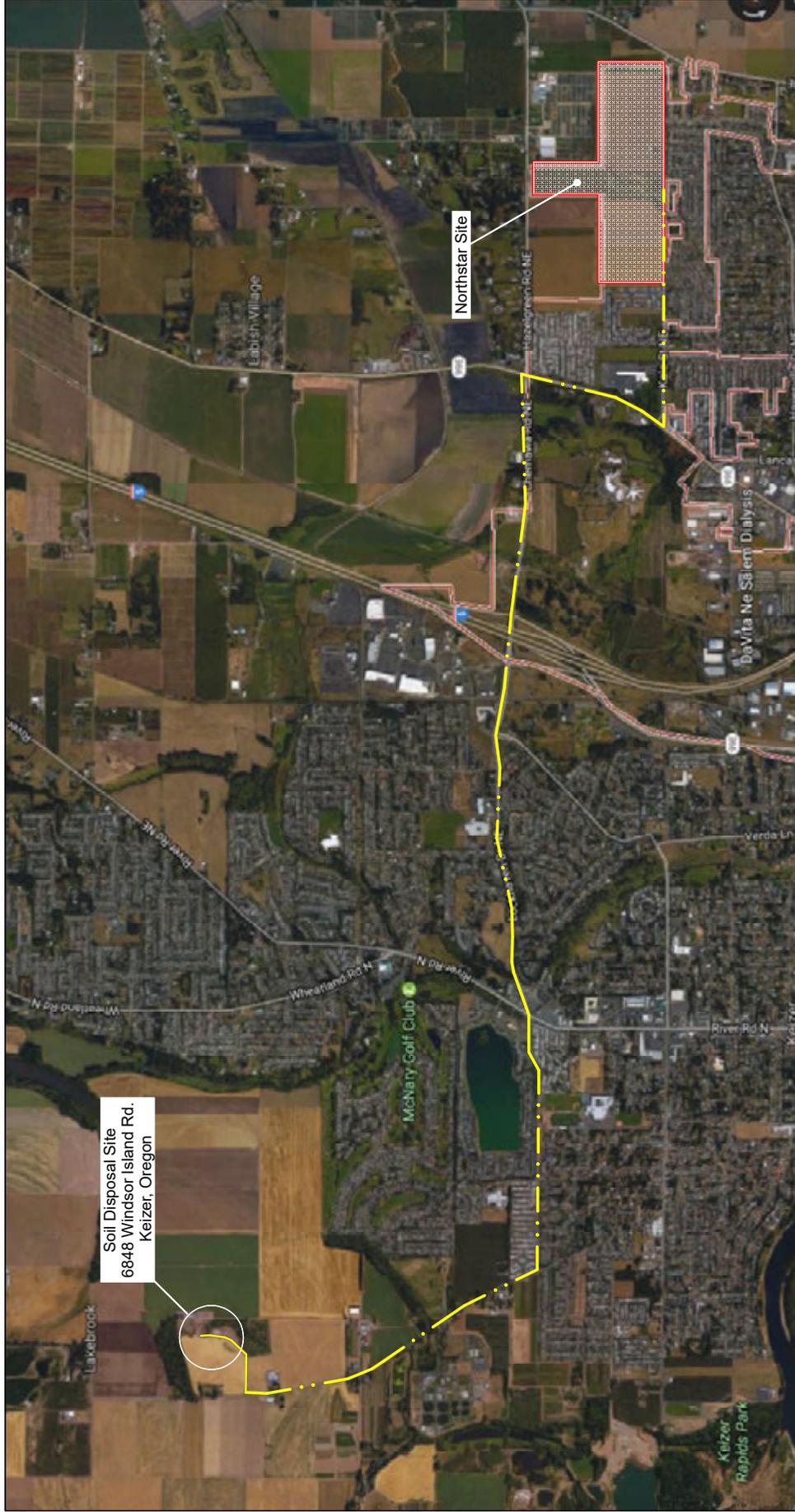
-  No soil removal proposed.
-  Soil removal proposed from 0-6 inches below ground surface.
-  Soil removal proposed from 0-12 inches below ground surface.
-  Soil removal proposed from 0-18 inches below ground surface.
-  Soil removal proposed from 0-30 inches below ground surface (cell 3A only).



PRIVATE RESIDENCE



PROPOSED DEPTHS OF SOIL REMOVAL AND CONFIRMATION SOIL SAMPLING STRATEGY			
Proposed North Star Development Salem, Oregon			
SIZE	CAGE CODE	DWG NO	PROJECT No.
B		April 2017	FIGURE 3



Soil Disposal Site
6848 Windsor Island Rd.
Keizer, Oregon

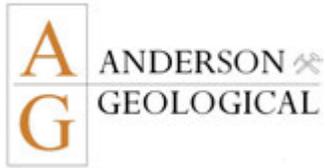
Northstar Site

	PROPOSED TRUCK ROUTE BETWEEN NORTHSTAR SITE AND DISPOSAL SITE	
	Proposed North Star Development, Salem, Oregon	
SIZE	A	REV
PROJECT NO. 1503.00		FIGURE 4
April 2017		



NOTE: Tax lot 00100 is owned by Zielinski Limited Trust. Tax lot 00300 is owned by Windsor Island Company LLC

 ANDERSON GEOLOGICAL	PROPOSED SOIL DISPOSAL SITE 6848 Windsor Island Rd. N, Keizer, Oregon		
	Proposed North Star Development, Salem, Oregon		
SIZE A		PROJECT NO. 1503.00	REV
	April 2017	FIGURE 5	



August 6, 2017

Ms. Nancy Sawka
Oregon Dept. of Environmental Quality
4026 Fairview Industrial Drive
Salem, Oregon 97302

RE: Addendum #1 to Remedial Action Work Plan
Proposed Northstar Development
Salem, Oregon
AGI Project #1503.00

Dear Ms. Sawka:

This document presents the first addendum to the Remedial Action Work Plan for the proposed Northstar Development in Salem, Oregon. This addendum describes in detail the dust control measures and temporary soil stockpiling procedures that are to be employed during excavation of dieldrin-contaminated soils at the Northstar site.

The following sections (Sections 4.4 and 4.5) should be added to the Remedial Action Work Plan:

4.4 Dust Control - General

The term “contaminated cell” in this section refers to cells in which the soil contains dieldrin in excess of the Oregon residential risk-based concentration (RBCs) for the *soil ingestion, dermal contact, and inhalation exposure* pathway. The term “non-contaminated cell” refers to cells in which the soil contains dieldrin below residential RBCs, including soils in which dieldrin was not detected above laboratory reporting limits.

Exposed soil may be susceptible to wind erosion and generation of dust. While some dust emissions are inevitable, activities that disturb soils from contaminated cells will be managed in the following manner to minimize emissions:

- 1) Prior to disturbing the soil in a contaminated cell, the soils will be pre-wetted with water using water trucks and/or sprinklers. The water will be obtained from on-site wells, therefore the water trucks will remain on site for the duration of the project without the need to move off site for water.

PO Box 649
Wilsonville, Oregon 97070
(503) 682-2500

- 2) Soils will be kept moistened with water as needed during excavation, loading, scraping and grading of soil as needed to minimize visible dust emissions. Two water trucks will be on site to perform watering activities. Workers will take precautions while working and driving on both contaminated and non-contaminated cells to minimize dust emissions.

A Certified Industrial Hygienist will be on site during all work involving excavation, loading, hauling and/or dumping of soil from contaminated cells. The CIH will evaluate work practices and dust suppression practices as they relate to worker exposure and public exposure to dieldrin, The CIH will also perform daily exposure air monitoring for workers and monitoring of ambient air around boundaries of the work site to assess the potential exposure of persons off-site to dieldrin.

With prior notification and approval by DEQ, the CIH will have the authority to stop site activities until work practices or engineering controls are implemented that are designed to reduce human exposure to the contaminant. Air monitoring may be suspended if, in the opinion of the CIH, it is warranted based on the measured airborne levels of dieldrin.

4.4.1 Dust Control – Phase I

Phase I of the excavation involves removal of soil from cells 8,9,10, 13, 14, 15 and 33 using scrapers. The soil will be hauled to cells 19 and 26 for temporary stockpiling.

- 1) The contaminated soil will be removed from cells 8,9,10, 13, 14, 15 and 33 using scrapers.
- 2) The scrapers will run between the contaminated cells and the stockpile area on non-contaminated cells on a designated haul road. Water will be used for dust suppression during scraping, hauling and dumping. The haul road will also be kept watered for dust suppression.

4.4.2 Dust Control – Phase II

Phase II of the excavation involves removal of soil from the contaminated cells and transporting the soils off-site to the disposal location at 6848 Windsor Island Road.

- 1) The truck loading area will consist of a temporary roadway covered with clean crushed rock. The trucks will remain on the roadway at all times they are on the work site.
- 2) The trucks will be carefully loaded, taking care to minimize spillage of soil onto the exterior of the truck and roadway surface. Upon completion of the loading, the exterior of the truck will be inspected by the driver and all loose soil will be removed. The trucks will proceed through an overhead wash bar which will rinse the exterior of the truck and provide additional

moisture to the soils in the truck bed. The amount of water applied to the truck and soil will be minimized to prevent excess water that may accumulate in the truck bed. Runoff of the rinse

- 3) Water will not be captured, rather it will be allowed run onto the temporary road surface and seep into the ground.
- 4) Prior to leaving the Northstar site, the load will be covered securely with a tarp.
- 5) At the soil disposal site, the soils will be moistened with water during unloading and grading as needed to minimize visible dust emissions.
- 6) After dumping the load of contaminated soil, the truck bed will be swept clean of residual soil in the unloading area by the driver before obtaining clean rock for delivery to the project site.

4.5 Temporary Soil Stockpile

In August 2017, soil exceeding residential risk-based concentrations on the east half of the Northstar site (portions of cells 8, 9, 10, 13, 14, 15, and all of cell 33) will be removed using scrapers and temporarily stockpiled in the general areas of sections 19 and 26, located on the west area of the Northstar site. The approximate stockpile location is shown on Figure 6 (attached). This phase of work is referred to as Phase I.

The reason for the temporary stockpiling of soil is to allow clearing of the east half of the site so construction can begin in that area while public comments are addressed regarding the transportation of contaminated soil on public roadways and disposal of the material at the Zielinski farm. The stockpiled soil will be removed along with the other contaminated soil on the Northstar site during Phase II of the project in 2018 after the off-site disposal site has been approved.

For Phase I of the work, scrapers will remove soil from the contaminated cells. The loaded material will be wetted with water trucks, using side sprayers as needed to direct the water to specific locations. All of the scrapers will remain on the Northstar site on temporary haul roads. The scrapers will travel over designated haul roads located on contaminated and non-contaminated cells. The loads will not be covered since the trucks are travelling only short distances (maximum distance: 2,500 feet), they will not be traveling over public roads, and the loads will be wetted. If visible dust is observed from the loaded soil, the watering practices will be modified or the loads will be covered, as necessary.

Prior to leaving contaminated cells and crossing onto non-contaminated cells, loose soil will be removed from the exterior of the heavy equipment. Soil tightly embedded into steel track treads and rubber tire treads will not be removed until the excavation is completed in these cells.

Ms. Nancy Sawka
Re: Work Plan Addendum #1, Northstar Development
August 6, 2017
Page 4

Scrapers will cross over the drainage ditch only in areas where the ditch is culverted underground. The ground surface over the culvert will be reinforced as needed to prevent damaging the culvert by the equipment.

After the soil removal is completed, the upper 2-3 inches of soil will be removed from the haul roads and placed in the soil stockpile area as contaminated soil. All heavy equipment will be decontaminated as described in the Remedial Action Work Plan upon completion of Phase I excavation.

The contaminated soils placed in cells 19 and 26 will be spread evenly over an area of approximately four acres, to a thickness of approximately 3 feet. While awaiting laboratory results for the final confirmation samples, the stockpile will be watered using sprinklers or water trucks as needed to maintain dust suppression.

After the results of the final confirmation samples are obtained from the excavated cells, the finished surface and sides of the stockpile will immediately be hydroseeded with 120#/acre of 80/20 perennial rye grass/fescue blend with 15#/acre "Quick Guard" quick-germinating wheatgrass for early erosion control. The seed will be applied with 2,000#/acre hydromulch with tackifier applied as the initial erosion control until the vegetation becomes established.

A silt fence will be in place along both sides of the drainage ditch to the east for erosion control from the stockpile, as required by the project's 1200-C construction stormwater permit. Additional silt fence will be placed adjacent to the downhill side of the temporary stockpile.

The stockpile will be inspected monthly, or following periods of heavy, prolonged precipitation. Any areas of bare or eroded soil will be noted and immediately repaired (soil replaced and re-seeded).

Respectfully,

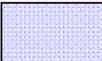


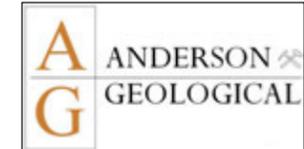
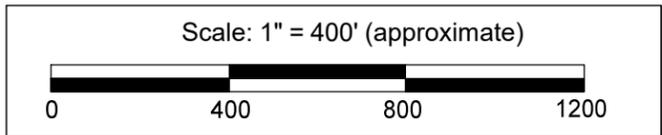
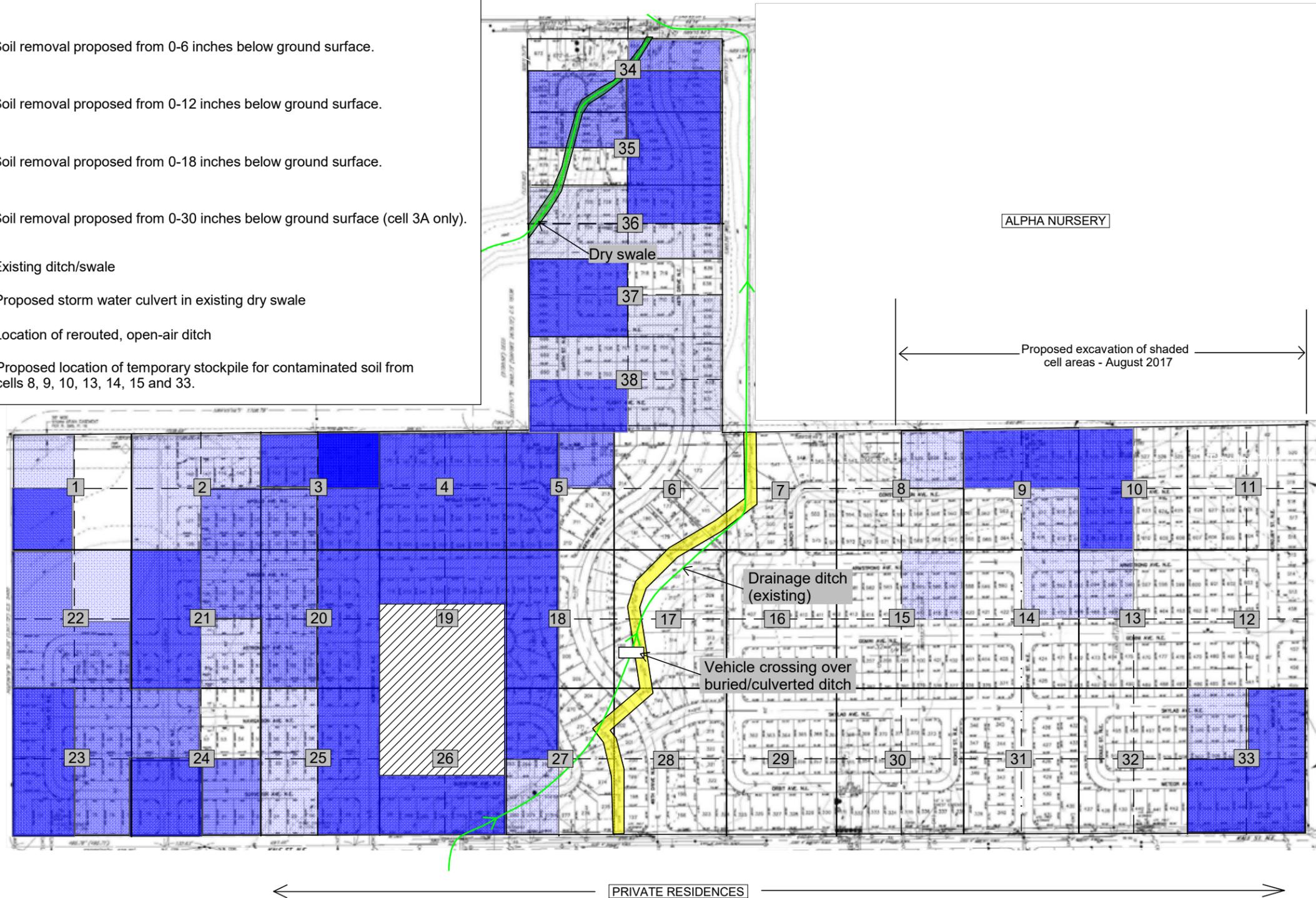
Erik Anderson, R.G.
Hydrogeologist

Attachment: Figure 6 – Proposed Location of Temporary Soil Stockpile



LEGEND

-  No soil removal proposed.
-  Soil removal proposed from 0-6 inches below ground surface.
-  Soil removal proposed from 0-12 inches below ground surface.
-  Soil removal proposed from 0-18 inches below ground surface.
-  Soil removal proposed from 0-30 inches below ground surface (cell 3A only).
-  Existing ditch/swale
-  Proposed storm water culvert in existing dry swale
-  Location of rerouted, open-air ditch
-  Proposed location of temporary stockpile for contaminated soil from cells 8, 9, 10, 13, 14, 15 and 33.



PROPOSED LOCATION OF TEMPORARY SOIL STOCKPILE (WORK PLAN ADDENDUM #1)			
Proposed North Star Development Salem, Oregon			
SIZE B	CAGE CODE	DWG NO	PROJECT No.
		August 2017	FIGURE 6

APPENDIX B
Air Monitoring Report (PBS Engineering and Environmental)



September 27, 2017

Erik Anderson
Anderson Geological, Inc.
PO Box 649
Wilsonville, Oregon 90707

Via email: erik@andersongeo.com

Regarding: Report
Northstar Dieldrin Cleanup Project
Kale Street NE
Salem, Oregon
PBS Project 25513.000, Phase 0001, Task 001

Dear Mr. Anderson:

From August 7 through August 16, PBS Engineering and Environmental Inc. (PBS) provided project oversight during the excavation and stockpiling of soils from the Northstar project located along the north side of Kale Street NE in Salem, Oregon. During the cleanup project, PBS visually monitored dust levels associated with the excavation, hauling, and stockpiling of soil contaminated with dieldrin. When dusty conditions were observed, the general contractor was notified and water spray operations were augmented. During the soil cleanup operations, PBS collected both total airborne dust samples and total airborne dieldrin samples. PBS collected air samples on each of the days we were on site.

Based upon review of the analytical results from these tests, airborne concentrations of dieldrin during the cleanup operations are very low and are below the project specific airborne risk based concentration established by the Oregon DEQ of 0.11 micrograms per cubic meter ($\mu\text{g}/\text{M}^3$).

AIR MONITORING RESULTS

PBS collected air samples using a combination of high volume and low volume vacuum pumps and both pre-weighed filter cassettes and OSHA OVS sample tubes. The filter cassettes were used to collect total airborne dust samples and the OVS sample tubes were used to collect airborne dieldrin samples.

The samples were collected from inside and outside the cabs of various pieces of excavation equipment; from immediately adjacent to the excavation, hauling and dumping operations; and from the property boundaries that were located directly downwind of these operations.

Pre-weighed sample cassettes were shipped under chain of custody controls to RJ Lee Group in Monroeville, Pennsylvania for analysis by NIOSH 500, which is a gravimetric analytical method. OVS samples were submitted under chain-of-custody controls to ALS Environmental in Salt Lake City, Utah for dieldrin analysis by Method NIOSH 5605 GC-ECD.

While PBS collected samples each day of the project, only those samples representative of specific cleanup operations were submitted for analysis. The remaining samples have been archived. It should be noted that the

samples submitted for analysis were collected during first phases of the operations during operations that were noticeably dusty. It is PBS' opinion that each of the samples that were analyzed were representative of a worst-case scenario.

Table 1 summarizes the analytical results of the airborne dust sampling.

Table 1. Airborne Dust Monitoring Results

Sample	Date	Operation/Location	Result	RBC Calculated*
254191	08/07/2017	Property line near pole barn/water tank	0.20 mg/M ³	1,100 mg/M ³
254189	08/07/2017	Property line south edge of dump area west	0.099 mg/M ³	1,100 mg/M ³
254206	08/07/2017	South edge of haul road in middle	0.34 mg/M ³	1,100 mg/M ³
254205	08/07/2017	Inside scraper cab	0.33 mg/M ³	1,100 mg/M ³
254226	08/08/2017	South edge of east dig area	0.16 mg/M ³	1,100 mg/M ³
254199	08/08/2017	Inside truck cab	0.56 mg/M ³	1,100 mg/M ³
254224	08/08/2017	South edge of dump area	0.20 mg/M ³	1,100 mg/M ³
254193	08/08/2017	Property line near pole barn/water tank	0.11 mg/M ³	1,100 mg/M ³
249035	08/11/2017	Inside scraper cab	0.15 mg/M ³	1,100 mg/M ³
249027	08/11/2017	Property line south edge of dump area west	0.077 mg/M ³	1,100 mg/M ³
249029	08/11/2017	Property line near pole barn/water tank	<0.022 mg/M ³	1,100 mg/M ³
249030	08/11/2017	Northeast project area upwind of operations	<0.023 mg/M ³	1,100 mg/M ³
249023	08/11/2017	Property line south edge of east dig area	<0.35 mg/M ³	1,100 mg/M ³
249024	08/11/2017	Inside excavator cab during excavation	0.53 mg/M ³	1,100 mg/M ³
249037	08/12/2017	East side of area 33 during excavation	0.21 mg/M ³	1,100 mg/M ³
249022	08/12/2017	Inside excavator cab	0.154 mg/M ³	1,100 mg/M ³
249025	08/12/2017	Southeast corner of area 33 during excavation	0.20 mg/M ³	1,100 mg/M ³

*RBC Calculated for total dust is based upon the assumption that the dust contains 1 ppm dieldrin

As can be seen in the table above, the total dust levels were very low. Assuming a dieldrin soil concentration of 1 part per million (ppm) the calculated dieldrin concentrations in these airborne dust samples ranged from non-detected to 0.00000056 ug/M³.

Table 2 summarizes the analytical results of the airborne dieldrin sampling.

Table 2. Airborne Dieldrin Monitoring Results

Sample	Date	Operation/Location	Result	RBC
OVS-0295	08/07/2017	Property line near pole barn/water tank	< 0.0021 ug/M ³	0.11 ug/M ³
OVS-0459	08/07/2017	South edge of east dig area	< 0.0020 ug/M ³	0.11 ug/M ³
OVS-0424	08/07/2017	Inside scraper cab	< 0.0022 ug/M ³	0.11 ug/M ³
OVS-0605	08/08/2017	South edge of east dig area	< 0.0022 ug/M ³	0.11 ug/M ³
OVS-0123	08/08/2017	Inside truck cab	< 0.0020 ug/M ³	0.11 ug/M ³
OVS-0430	08/08/2017	Property line near pole barn/water tank	< 0.0021 ug/M ³	0.11 ug/M ³
OVS-0086	08/11/2017	Inside scraper cab	< 0.0021 ug/M ³	0.11 ug/M ³
OVS-0603	08/11/2017	Property line north east of unit 33 excavation	< 0.0021 ug/M ³	0.11 ug/M ³
OVS-0302	08/11/2017	North edge of haul road	< 0.0022 ug/M ³	0.11 ug/M ³

OVS-0332	08/11/2017	North edge of unit 33 excavation	< 0.0061 ug/M ³	0.11 ug/M ³
OVS-0377	08/11/2017	Inside excavator cab	< 0.0094 ug/M ³	0.11 ug/M ³
OVS-0409	08/12/2017	Northeast corner of east dig area unit 33	< 0.0037 ug/M ³	0.11 ug/M ³
OVS-0335	08/12/2017	Inside dump truck cab	< 0.0035 ug/M ³	0.11 ug/M ³
OVS-0263	08/12/2017	North edge of east dig area unit 33	< 0.0037 ug/M ³	0.11 ug/M ³

As can be seen in the table above, the total airborne levels of dieldrin were not detectable at a detection limit that was significantly below the project specific RBC of 0.11 ug/M³.

CONCLUSIONS AND RECOMMENDATIONS

PBS measured airborne concentrations of total dust and dieldrin associated with the excavation dieldrin contaminated soil at the Northstar project located in Salem, Oregon. Both total dust and total dieldrin levels were significantly below the RBC limit developed for this project. At this time, it is PBS' opinion that additional air monitoring on this site is not warranted as long as airborne dust levels are controlled. Based upon PBS' oversight of the project, the general contractor has demonstrated an ability and a willingness to utilize a water spray to keep dust down when impacted soils are being disturbed.

LIMITATIONS OF SCOPE

This study was limited to the tests and locations as indicated above. The site as a whole may have other environmental concerns that will not be characterized by this study. The findings and conclusions of this work are not scientific certainties but probabilities based on professional judgment concerning the significance of the data gathered during the course of this investigation. PBS is not able to represent conditions on the site or adjoining sites beyond those detected or observed by PBS.

PBS respectfully submits these results of our indoor air quality investigation. Please feel free to contact me at 503.417.7597 or douglas@pbsusa.com with any questions or comments.

Sincerely,



Douglas Hancock CIH CSP
Senior Project Manager



Attachment(s): Lab Reports



ANALYTICAL REPORT

Report Date: August 10, 2017

Douglas Hancock
PBS Environmental (Portland)
4412 SW Corbett Ave.
Portland, OR 97239

Phone: (503) 417-7597
Fax: (503) 248-0223
E-mail: douglas.hancock@pbsenv.com

Workorder: **34-1722162**

Client Project ID: North Star Development-Salem
O
Purchase Order: 25513.000
Project Manager: Stella Hanis

Analytical Results

Sample ID: OUS-0295	Collected: 08/07/2017			
Lab ID: 1722162001	Received: 08/09/2017			
Method: NIOSH 5605 by GC-ECD	Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter			
	Analyzed: 08/10/2017 (196526)			
Sampling Info: Air Volume 946 L				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000021	<0.00000014	0.0020

Sample ID: OUS-0459	Collected: 08/07/2017			
Lab ID: 1722162002	Received: 08/09/2017			
Method: NIOSH 5605 by GC-ECD	Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter			
	Analyzed: 08/10/2017 (196526)			
Sampling Info: Air Volume 1018 L				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000020	<0.00000013	0.0020

Sample ID: OUS-0424	Collected: 08/07/2017			
Lab ID: 1722162003	Received: 08/09/2017			
Method: NIOSH 5605 by GC-ECD	Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter			
	Analyzed: 08/10/2017 (196526)			
Sampling Info: Air Volume 902 L				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000022	<0.00000014	0.0020

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ALS GROUP USA, CORP. An ALS Limited Company

Environmental

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER



ANALYTICAL REPORT

Workorder: **34-1722162**

Client Project ID: North Star Development-Salem
O

Purchase Order: 25513.000

Project Manager: Stella Hanis

Analytical Results

Sample ID: OUS-0605		Collected: 08/07/2017		
Lab ID: 1722162004		Received: 08/09/2017		
Method: NIOSH 5605 by GC-ECD		Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter		
		Analyzed: 08/10/2017 (196526)		
Sampling Info: Air Volume 902 L				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000022	<0.00000014	0.0020

Sample ID: OUS-0123		Collected: 08/07/2017		
Lab ID: 1722162005		Received: 08/09/2017		
Method: NIOSH 5605 by GC-ECD		Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter		
		Analyzed: 08/10/2017 (196526)		
Sampling Info: Air Volume 999 L				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000020	<0.00000013	0.0020

Sample ID: OUS-0430		Collected: 08/07/2017		
Lab ID: 1722162006		Received: 08/09/2017		
Method: NIOSH 5605 by GC-ECD		Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter		
		Analyzed: 08/10/2017 (196526)		
Sampling Info: Air Volume 931 L				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000021	<0.00000014	0.0020

Sample ID: 254191		Collected: 08/07/2017	
Lab ID: 1722162007		Received: 08/09/2017	
Method: NIOSH 0500 Mod., PVC Filter		Media: PVC Filter	
		Analyzed: 08/10/2017 (196591)	
Sampling Info: Air Volume 4300 L			
Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)
Total Dust	0.84	0.20	0.020

Sample ID: 254189		Collected: 08/07/2017	
Lab ID: 1722162008		Received: 08/09/2017	
Method: NIOSH 0500 Mod., PVC Filter		Media: PVC Filter	
		Analyzed: 08/10/2017 (196591)	
Sampling Info: Air Volume 4240 L			
Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)
Total Dust	0.42	0.099	0.020



ANALYTICAL REPORT

Workorder: **34-1722162**

Client Project ID: North Star Development-Salem

O

Purchase Order: 25513.000

Project Manager: Stella Hanis

Analytical Results

Sample ID: 254206	Collected: 08/07/2017								
Lab ID: 1722162009	Received: 08/09/2017								
Method: NIOSH 0500 Mod., PVC Filter	Media: PVC Filter								
Sampling Info: Air Volume 1380 L	Analyzed: 08/10/2017 (196591)								
<table border="1"> <thead> <tr> <th>Analyte</th> <th>Result (mg/sample)</th> <th>Result (mg/m³)</th> <th>RL (mg/sample)</th> </tr> </thead> <tbody> <tr> <td>Total Dust</td> <td>0.47</td> <td>0.34</td> <td>0.020</td> </tr> </tbody> </table>		Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)	Total Dust	0.47	0.34	0.020
Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)						
Total Dust	0.47	0.34	0.020						

Sample ID: 254205	Collected: 08/07/2017								
Lab ID: 1722162010	Received: 08/09/2017								
Method: NIOSH 0500 Mod., PVC Filter	Media: PVC Filter								
Sampling Info: Air Volume 840 L	Analyzed: 08/10/2017 (196591)								
<table border="1"> <thead> <tr> <th>Analyte</th> <th>Result (mg/sample)</th> <th>Result (mg/m³)</th> <th>RL (mg/sample)</th> </tr> </thead> <tbody> <tr> <td>Total Dust</td> <td>0.27</td> <td>0.33</td> <td>0.020</td> </tr> </tbody> </table>		Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)	Total Dust	0.27	0.33	0.020
Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)						
Total Dust	0.27	0.33	0.020						

Sample ID: 254226	Collected: 08/07/2017								
Lab ID: 1722162011	Received: 08/09/2017								
Method: NIOSH 0500 Mod., PVC Filter	Media: PVC Filter								
Sampling Info: Air Volume 4100 L	Analyzed: 08/10/2017 (196591)								
<table border="1"> <thead> <tr> <th>Analyte</th> <th>Result (mg/sample)</th> <th>Result (mg/m³)</th> <th>RL (mg/sample)</th> </tr> </thead> <tbody> <tr> <td>Total Dust</td> <td>0.66</td> <td>0.16</td> <td>0.020</td> </tr> </tbody> </table>		Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)	Total Dust	0.66	0.16	0.020
Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)						
Total Dust	0.66	0.16	0.020						

Sample ID: 254199	Collected: 08/07/2017								
Lab ID: 1722162012	Received: 08/09/2017								
Method: NIOSH 0500 Mod., PVC Filter	Media: PVC Filter								
Sampling Info: Air Volume 999 L	Analyzed: 08/10/2017 (196591)								
<table border="1"> <thead> <tr> <th>Analyte</th> <th>Result (mg/sample)</th> <th>Result (mg/m³)</th> <th>RL (mg/sample)</th> </tr> </thead> <tbody> <tr> <td>Total Dust</td> <td>0.56</td> <td>0.56</td> <td>0.020</td> </tr> </tbody> </table>		Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)	Total Dust	0.56	0.56	0.020
Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)						
Total Dust	0.56	0.56	0.020						

Sample ID: 254224	Collected: 08/07/2017								
Lab ID: 1722162013	Received: 08/09/2017								
Method: NIOSH 0500 Mod., PVC Filter	Media: PVC Filter								
Sampling Info: Air Volume 1720 L	Analyzed: 08/10/2017 (196591)								
<table border="1"> <thead> <tr> <th>Analyte</th> <th>Result (mg/sample)</th> <th>Result (mg/m³)</th> <th>RL (mg/sample)</th> </tr> </thead> <tbody> <tr> <td>Total Dust</td> <td>0.34</td> <td>0.20</td> <td>0.020</td> </tr> </tbody> </table>		Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)	Total Dust	0.34	0.20	0.020
Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)						
Total Dust	0.34	0.20	0.020						



ANALYTICAL REPORT

Workorder: **34-1722162**

Client Project ID: North Star Development-Salem
O

Purchase Order: 25513.000

Project Manager: Stella Hanis

Analytical Results

Sample ID: 254193	Collected: 08/07/2017		
Lab ID: 1722162014	Received: 08/09/2017		
Method: NIOSH 0500 Mod., PVC Filter	Media: PVC Filter		
	Analized: 08/10/2017 (196591)		
Sampling Info: Air Volume 4230 L			
Analyte	Result (mg/sample)	Result (mg/m ³)	RL (mg/sample)
Total Dust	0.46	0.11	0.020

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 0500 Mod., PVC Filter	/S/ Andrew Wilson 08/10/2017 14:31	/S/ Shaina Wiest 08/10/2017 15:24
NIOSH 5605 by GC-ECD	/S/ Mila V. Potekhin 08/10/2017 10:52	/S/ Lyle Edwards 08/10/2017 14:27

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als.lt.lab@ALSGlobal.com
Web: www.alssl.com



ANALYTICAL REPORT

Workorder: **34-1722162**

Client Project ID: North Star Development-Salem
O

Purchase Order: 25513.000
Project Manager: Stella Hanis

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint ,Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Soil, Dust, Paint ,Air	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	DIETARY SUPPLEMENTS	ADE-1420	http://www.aiclasscorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
ND = Not Detected, Testing result not detected above the LOD or LOQ.
NA = Not Applicable.
** No result could be reported, see sample comments for details.
< This testing result is less than the numerical value.
() This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.



ANALYTICAL REPORT

Report Date: August 16, 2017

Douglas Hancock
PBS Environmental (Portland)
4412 SW Corbett Ave.
Portland, OR 97239

Phone: (503) 417-7597
Fax: (503) 248-0223
E-mail: douglas.hancock@pbsenv.com

Workorder: **34-1722703**

Client Project ID: North Star Development,
Salem
Purchase Order: 25513.000
Project Manager: Stella Hanis

Analytical Results

Sample ID: OVS 0086	Collected: 08/11/2017			
Lab ID: 1722703001	Received: 08/15/2017			
Method: NIOSH 5605 by GC-ECD	Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter			
	Analyzed: 08/16/2017 (196886)			
Sampling Info: Air Volume 958 L				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000021	<0.00000013	0.0020

Sample ID: OVS 0603	Collected: 08/11/2017			
Lab ID: 1722703002	Received: 08/15/2017			
Method: NIOSH 5605 by GC-ECD	Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter			
	Analyzed: 08/16/2017 (196886)			
Sampling Info: Air Volume 956 L				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000021	<0.00000013	0.0020

Sample ID: OVS 0302	Collected: 08/11/2017			
Lab ID: 1722703003	Received: 08/15/2017			
Method: NIOSH 5605 by GC-ECD	Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter			
	Analyzed: 08/16/2017 (196886)			
Sampling Info: Air Volume 896 L				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000022	<0.00000014	0.0020

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Environmental

www.alsglobal.com

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ANALYTICAL REPORT

Workorder: **34-1722703**

Client Project ID: North Star Development,
Salem

Purchase Order: 25513.000

Project Manager: Stella Hanis

Analytical Results

Sample ID: OVS 0332		Collected: 08/11/2017		
Lab ID: 1722703004		Received: 08/15/2017		
Method: NIOSH 5605 by GC-ECD		Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter		
		Analyzed: 08/16/2017 (196886)		
Sampling Info: Air Volume 327 L				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000061	<0.00000039	0.0020

Sample ID: OVS 0377		Collected: 08/11/2017		
Lab ID: 1722703005		Received: 08/15/2017		
Method: NIOSH 5605 by GC-ECD		Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter		
		Analyzed: 08/16/2017 (196886)		
Sampling Info: Air Volume 213 L				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000094	<0.00000060	0.0020

Sample ID: OVS 0409		Collected: 08/11/2017		
Lab ID: 1722703006		Received: 08/15/2017		
Method: NIOSH 5605 by GC-ECD		Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter		
		Analyzed: 08/16/2017 (196886)		
Sampling Info: Air Volume 547.5 L				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000037	<0.00000023	0.0020

Sample ID: OVS 0335		Collected: 08/11/2017		
Lab ID: 1722703007		Received: 08/15/2017		
Method: NIOSH 5605 by GC-ECD		Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter		
		Analyzed: 08/16/2017 (196886)		
Sampling Info: Air Volume 567.5 L				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000035	<0.00000023	0.0020



ANALYTICAL REPORT

Workorder: **34-1722703**

Client Project ID: North Star Development,
Salem

Purchase Order: 25513.000

Project Manager: Stella Hanis

Analytical Results

Sample ID: OVS 0263		Collected: 08/11/2017		
Lab ID: 1722703008		Sampling Location: North Star Developme		Received: 08/15/2017
Method: NIOSH 5605 by GC-ECD		Media: SKC 226-58, Sorbent Tube, XAD-2 OVS, Quartz Filter		Analyzed: 08/16/2017 (196886)
Sampling Info: Air Volume 545 L				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Dieldrin	<0.0020	<0.0000037	<0.00000024	0.0020

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 5605 by GC-ECD	/S/ Mila V. Potekhin 08/16/2017 11:57	/S/ Lyle Edwards 08/16/2017 13:07

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alssl.com



ANALYTICAL REPORT

Workorder: **34-1722703**

Client Project ID: North Star Development,
Salem

Purchase Order: 25513.000

Project Manager: Stella Hanis

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	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwl/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
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	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Soil, Dust, Paint ,Air	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	DIETARY SUPPLEMENTS	ADE-1420	http://www.aiclasscorp.com

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NA = Not Applicable.

** No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

() This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

LABORATORY REPORT

 PBS Engineering & Environmental
 4412 Southwest Corbett Ave.
 Portland, OR 97239

 Attn: Doug Hancock
 Phone: 503-417-7597
 Fax: 503-248-0223
 Email: douglas@pbsusa.com

 RJ Lee Group Job No.: PA150820170006
 Samples Received: August 15, 2017
 Report Date: August 16, 2017
 Client Project: 25513.000
 Purchase Order No.: N/A
 Matrix: Air and Emissions
 Prep/Analysis: NIOSH 0500 / NIOSH 0500-PA

Client Sample ID RJ Lee Group ID	Sampling Date	Sample Volume (L) Sampling Time (min.)	Analyte	Sample Concentration (mg/filter)	Minimum Reporting Limit (mg/filter)	Sample Concentration mg/m ³	Minimum Reporting Limit (mg/m ³)	Analysis Date	Q
249035 PA150820170006-001	08/11/2017	1437 L N/A	Total Particulate	0.22	0.10	0.15	0.070	08/16/2017	A
249027 PA150820170006-002	08/11/2017	1434 L N/A	Total Particulate	0.11	0.10	0.077	0.070	08/16/2017	A
249029 PA150820170006-003	08/11/2017	4480 L N/A	Total Particulate	< 0.10	0.10	< 0.022	0.022	08/16/2017	A
249030 PA150820170006-004	08/11/2017	4370 L N/A	Total Particulate	< 0.10	0.10	< 0.023	0.023	08/16/2017	A
249023 PA150820170006-005	08/11/2017	284 L N/A	Total Particulate	< 0.10	0.10	< 0.35	0.35	08/16/2017	A
249024 PA150820170006-006	08/11/2017	355 L N/A	Total Particulate	0.19	0.10	0.53	0.28	08/16/2017	A
249037 PA150820170006-007	08/12/2017	2168.1 L N/A	Total Particulate	0.46	0.10	0.21	0.046	08/16/2017	A
249022 PA150820170006-008	08/12/2017	794.5 L N/A	Total Particulate	0.43	0.10	0.54	0.13	08/16/2017	A
249025 PA150820170006-009	08/12/2017	2316.6 L N/A	Total Particulate	0.47	0.10	0.20	0.043	08/16/2017	A

Comments:
Report Qualifiers (Q):

H = Holding times for preparation or analysis exceeded

E = Value above highest calibration standard

B = Analyte detected in the associated Method Blank



 Richard A. Kautz
 Project Supervisor

LABORATORY REPORT

 PBS Engineering & Environmental
 4412 Southwest Corbett Ave.
 Portland, OR 97239

 Attn: Doug Hancock
 Phone: 503-417-7597
 Fax: 503-248-0223
 Email: douglas@pbsusa.com

 RJ Lee Group Job No.: PA150820170006
 Samples Received: August 15, 2017
 Report Date: August 16, 2017
 Client Project: 25513.000
 Purchase Order No.: N/A
 Matrix: Air and Emissions
 Prep/Analysis: NIOSH 0500 / NIOSH 0500-PA

Client Sample ID RJ Lee Group ID	Sampling Date	Sample Volume (L) Sampling Time (min.)	Analyte	Sample Concentration (mg/filter)	Minimum Reporting Limit (mg/filter)	Sample Concentration mg/m ³	Minimum Reporting Limit (mg/m ³)	Analysis Date	Q
-------------------------------------	---------------	---	---------	-------------------------------------	--	---	---	---------------	---

A = AIHA-LAP, LLC Accredited (Lab ID 100364)
J = Value below lowest calibration standard but above MDL (Method Detection Limit)
S = Spike Recovery outside accepted limits
L = LCS (Laboratory Control Standard)/SRM (Standard Reference Material) recovery outside accepted recovery limits
R = RPD (relative percent difference) outside accepted limits
D = RL (reporting limit verification) outside accepted limits

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of thirty (30) days before discarding. A shipping and handling fee will be assessed for the return of any samples.

This laboratory operates in accord with ISO 17025:2005 guidelines, and holds a limited scope of accreditations under different accrediting agencies; refer to <http://www.rjlg.com/about-us/accreditations/> for more information and current status. Unless it is specifically stated otherwise (under the Q column using the appropriate accrediting agency qualifier(s)) the work contained in this report is performed under RJLG's General Quality System requirements and is not part of any scope of accreditations. This report may not be used to claim product endorsement by any laboratory accrediting agency. The results contained in this report relate only to the items tested or to the sample(s) as received by the laboratory. Any reproduction of this document must be in full for the report to be valid.

Results have not been blank corrected unless otherwise noted. Samples were received in good condition unless otherwise noted. All QC samples are within acceptable established limits unless otherwise noted in the comments section of the report and/or with the appropriate flags under the report qualifiers (Q) column. Quality Control data is available upon request.



 Richard A. Kautz
 Project Supervisor

APPENDIX C
Laboratory Reports and Sample Chains of Custody

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Sunday, September 3, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

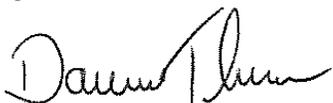
RE: Northstar / 1503.03

Enclosed are the results of analyses for work order A7H0364, which was received by the laboratory on 8/11/2017 at 12:52:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
13B-S-COMP	A7H0364-01	Soil	08/10/17 11:10	08/11/17 12:52
13B-N-COMP	A7H0364-02	Soil	08/10/17 12:08	08/11/17 12:52
14A-S-COMP	A7H0364-03	Soil	08/10/17 13:55	08/11/17 12:52
14A-N-COMP	A7H0364-04	Soil	08/10/17 14:21	08/11/17 12:52
10C-S-COMP	A7H0364-05	Soil	08/10/17 15:40	08/11/17 12:52
10C-N-COMP	A7H0364-06	Soil	08/10/17 16:14	08/11/17 12:52
13B-SA	A7H0364-07	Soil	08/10/17 11:02	08/11/17 12:52
13B-SB	A7H0364-08	Soil	08/10/17 11:04	08/11/17 12:52
13B-SC	A7H0364-09	Soil	08/10/17 11:06	08/11/17 12:52
13B-SD	A7H0364-10	Soil	08/10/17 11:08	08/11/17 12:52
14A-SA	A7H0364-15	Soil	08/10/17 13:47	08/11/17 12:52
14A-SB	A7H0364-16	Soil	08/10/17 13:49	08/11/17 12:52
14A-SC	A7H0364-17	Soil	08/10/17 13:51	08/11/17 12:52
14A-SD	A7H0364-18	Soil	08/10/17 13:53	08/11/17 12:52
10C-NA	A7H0364-23	Soil	08/10/17 16:06	08/11/17 12:52
10C-NB	A7H0364-24	Soil	08/10/17 16:08	08/11/17 12:52
10C-NC	A7H0364-25	Soil	08/10/17 16:10	08/11/17 12:52
10C-ND	A7H0364-26	Soil	08/10/17 16:12	08/11/17 12:52

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
13B-S-COMP (A7H0364-01)			Matrix: Soil		Batch: 7080649			
Dieldrin	0.0361	---	0.00105	mg/kg dry	1	08/15/17 13:51	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 78 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			98 %	Limits: 65-151 %	"	"	"	
13B-N-COMP (A7H0364-02)			Matrix: Soil		Batch: 7080649			
Dieldrin	0.0432	---	0.00109	mg/kg dry	1	08/15/17 14:26	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 79 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			93 %	Limits: 65-151 %	"	"	"	
14A-S-COMP (A7H0364-03)			Matrix: Soil		Batch: 7080649			
Dieldrin	0.0272	---	0.00105	mg/kg dry	1	08/15/17 15:19	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 75 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			91 %	Limits: 65-151 %	"	"	"	
14A-N-COMP (A7H0364-04)			Matrix: Soil		Batch: 7080649			
Dieldrin	0.0418	---	0.00104	mg/kg dry	1	08/15/17 15:37	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 76 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			93 %	Limits: 65-151 %	"	"	"	
10C-S-COMP (A7H0364-05)			Matrix: Soil		Batch: 7080649			
Dieldrin	0.00439	---	0.00110	mg/kg dry	1	08/15/17 15:54	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 75 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			93 %	Limits: 65-151 %	"	"	"	
10C-N-COMP (A7H0364-06)			Matrix: Soil		Batch: 7080649			
Dieldrin	0.0342	---	0.00111	mg/kg dry	1	08/15/17 16:12	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 85 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			100 %	Limits: 65-151 %	"	"	"	
13B-SA (A7H0364-07)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0253	---	0.00108	mg/kg dry	1	08/18/17 12:31	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 76 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			97 %	Limits: 65-151 %	"	"	"	
13B-SB (A7H0364-08)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0526	---	0.00106	mg/kg dry	1	08/18/17 12:40	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 82 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			105 %	Limits: 65-151 %	"	"	"	

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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:50

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
13B-SC (A7H0364-09)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0718	---	0.00106	mg/kg dry	1	08/18/17 12:57	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 83 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			109 %	Limits: 65-151 %	"	"	"	
13B-SD (A7H0364-10)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0328	---	0.00107	mg/kg dry	1	08/18/17 13:15	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 86 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			109 %	Limits: 65-151 %	"	"	"	
14A-SA (A7H0364-15)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0279	---	0.00108	mg/kg dry	1	08/18/17 13:32	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 85 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			104 %	Limits: 65-151 %	"	"	"	
14A-SB (A7H0364-16)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0452	---	0.00103	mg/kg dry	1	08/18/17 14:27	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 83 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			99 %	Limits: 65-151 %	"	"	"	
14A-SC (A7H0364-17)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0343	---	0.00104	mg/kg dry	1	08/18/17 14:44	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 80 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			103 %	Limits: 65-151 %	"	"	"	
14A-SD (A7H0364-18)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0565	---	0.00102	mg/kg dry	1	08/18/17 15:02	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 79 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			98 %	Limits: 65-151 %	"	"	"	
10C-NA (A7H0364-23)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.00148	---	0.00110	mg/kg dry	1	08/18/17 15:19	EPA 8081B	M-02
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 78 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			96 %	Limits: 65-151 %	"	"	"	
10C-NB (A7H0364-24)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0237	---	0.00108	mg/kg dry	1	08/18/17 15:37	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 77 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			98 %	Limits: 65-151 %	"	"	"	

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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
10C-NC (A7H0364-25)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0753	---	0.00105	mg/kg dry	1	08/18/17 11:56	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 78 %</i>	<i>Limits: 42-129 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>102 %</i>	<i>Limits: 65-151 %</i>	"	"	"	
10C-ND (A7H0364-26)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0833	---	0.00115	mg/kg dry	1	08/18/17 12:14	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 84 %</i>	<i>Limits: 42-129 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>102 %</i>	<i>Limits: 65-151 %</i>	"	"	"	

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Anderson Geological
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 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight								
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
13B-S-COMP (A7H0364-01)			Matrix: Soil	Batch: 7080705				
% Solids	91.8	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
13B-N-COMP (A7H0364-02)			Matrix: Soil	Batch: 7080705				
% Solids	89.2	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
14A-S-COMP (A7H0364-03)			Matrix: Soil	Batch: 7080705				
% Solids	92.9	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
14A-N-COMP (A7H0364-04)			Matrix: Soil	Batch: 7080705				
% Solids	92.6	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
10C-S-COMP (A7H0364-05)			Matrix: Soil	Batch: 7080705				
% Solids	86.8	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
10C-N-COMP (A7H0364-06)			Matrix: Soil	Batch: 7080705				
% Solids	87.7	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
13B-SA (A7H0364-07)			Matrix: Soil	Batch: 7080778				
% Solids	91.4	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
13B-SB (A7H0364-08)			Matrix: Soil	Batch: 7080778				
% Solids	91.0	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
13B-SC (A7H0364-09)			Matrix: Soil	Batch: 7080778				
% Solids	93.0	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
13B-SD (A7H0364-10)			Matrix: Soil	Batch: 7080778				
% Solids	90.7	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
14A-SA (A7H0364-15)			Matrix: Soil	Batch: 7080778				
% Solids	91.5	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
14A-SB (A7H0364-16)			Matrix: Soil	Batch: 7080778				
% Solids	93.6	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
14A-SC (A7H0364-17)			Matrix: Soil	Batch: 7080778				
% Solids	92.6	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
14A-SD (A7H0364-18)			Matrix: Soil	Batch: 7080778				
% Solids	93.0	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
10C-NA (A7H0364-23)			Matrix: Soil	Batch: 7080778				
% Solids	87.1	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
10C-NB (A7H0364-24)			Matrix: Soil	Batch: 7080778				
% Solids	90.8	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	

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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
10C-NC (A7H0364-25)			Matrix: Soil		Batch: 7080778			
% Solids	87.7	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
10C-ND (A7H0364-26)			Matrix: Soil		Batch: 7080778			
% Solids	84.5	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	

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 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080649 - EPA 3546						Soil						
Blank (7080649-BLK1)						Prepared: 08/14/17 10:14 Analyzed: 08/15/17 13:16						
EPA 8081B												
Dieldrin	ND	---	0.000909	mg/kg wet	1	---	---	---	---	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 81 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>101 %</i>	<i>65-151 %</i>		<i>"</i>						
LCS (7080649-BS1)						Prepared: 08/14/17 10:14 Analyzed: 08/15/17 13:33						
EPA 8081B												
Dieldrin	0.0499	---	0.00100	mg/kg wet	1	0.0500	---	100	56-136%	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 86 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>106 %</i>	<i>65-151 %</i>		<i>"</i>						
Duplicate (7080649-DUP1)						Prepared: 08/14/17 10:14 Analyzed: 08/15/17 14:08						
QC Source Sample: 13B-S-COMP (A7H0364-01)												
EPA 8081B												
Dieldrin	0.0342	---	0.00105	mg/kg dry	1	---	0.0361	---	---	5	30%	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 79 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>95 %</i>	<i>65-151 %</i>		<i>"</i>						
Matrix Spike (7080649-MS1)						Prepared: 08/14/17 10:14 Analyzed: 08/15/17 16:29						
QC Source Sample: 10C-N-COMP (A7H0364-06)												
EPA 8081B												
Dieldrin	0.0871	---	0.00110	mg/kg dry	1	0.0552	0.0342	96	56-136%	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 89 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>108 %</i>	<i>65-151 %</i>		<i>"</i>						
Batch 7080757 - EPA 3546						Soil						
Blank (7080757-BLK1)						Prepared: 08/17/17 07:57 Analyzed: 08/18/17 12:05						
EPA 8081B												
Dieldrin	ND	---	0.000909	mg/kg wet	1	---	---	---	---	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 105 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>123 %</i>	<i>65-151 %</i>		<i>"</i>						
LCS (7080757-BS1)						Prepared: 08/17/17 07:57 Analyzed: 08/18/17 12:22						
EPA 8081B												
Dieldrin	0.0591	---	0.00100	mg/kg wet	1	0.0500	---	118	56-136%	---	---	---

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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 7080757 - EPA 3546

Soil

LCS (7080757-BS1)

Prepared: 08/17/17 07:57 Analyzed: 08/18/17 12:22

EPA 8081B

Surr: 2,4,5,6-TCMX (Surr)

Recovery: 90 % Limits: 42-129 %

Dilution: 1x

Decachlorobiphenyl (Surr)

109 % 65-151 %

"

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 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080705 - Total Solids (Dry Weight)						Soil						
Batch 7080778 - Total Solids (Dry Weight)						Soil						
Duplicate (7080778-DUP1)						Prepared: 08/17/17 12:17 Analyzed: 08/18/17 07:29						
QC Source Sample: 13B-SA (A7H0364-07)												
EPA 8000C												
% Solids	91.0	---	1.00	% by Weight	1	---	91.4	---	---	0.4	10%	

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 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080649							
A7H0364-01	Soil	EPA 8081B	08/10/17 11:10	08/14/17 10:14	10.36g/5mL	10g/5mL	0.97
A7H0364-02	Soil	EPA 8081B	08/10/17 12:08	08/14/17 10:14	10.32g/5mL	10g/5mL	0.97
A7H0364-03	Soil	EPA 8081B	08/10/17 13:55	08/14/17 10:14	10.29g/5mL	10g/5mL	0.97
A7H0364-04	Soil	EPA 8081B	08/10/17 14:21	08/14/17 10:14	10.36g/5mL	10g/5mL	0.97
A7H0364-05	Soil	EPA 8081B	08/10/17 15:40	08/14/17 10:14	10.52g/5mL	10g/5mL	0.95
A7H0364-06	Soil	EPA 8081B	08/10/17 16:14	08/14/17 10:14	10.3g/5mL	10g/5mL	0.97
Batch: 7080757							
A7H0364-07	Soil	EPA 8081B	08/10/17 11:02	08/17/17 10:40	10.16g/5mL	10g/5mL	0.98
A7H0364-08	Soil	EPA 8081B	08/10/17 11:04	08/17/17 10:40	10.35g/5mL	10g/5mL	0.97
A7H0364-09	Soil	EPA 8081B	08/10/17 11:06	08/17/17 10:40	10.18g/5mL	10g/5mL	0.98
A7H0364-10	Soil	EPA 8081B	08/10/17 11:08	08/17/17 10:40	10.27g/5mL	10g/5mL	0.97
A7H0364-15	Soil	EPA 8081B	08/10/17 13:47	08/17/17 10:40	10.14g/5mL	10g/5mL	0.99
A7H0364-16	Soil	EPA 8081B	08/10/17 13:49	08/17/17 10:40	10.34g/5mL	10g/5mL	0.97
A7H0364-17	Soil	EPA 8081B	08/10/17 13:51	08/17/17 10:40	10.38g/5mL	10g/5mL	0.96
A7H0364-18	Soil	EPA 8081B	08/10/17 13:53	08/17/17 10:40	10.55g/5mL	10g/5mL	0.95
A7H0364-23	Soil	EPA 8081B	08/10/17 16:06	08/17/17 10:40	10.45g/5mL	10g/5mL	0.96
A7H0364-24	Soil	EPA 8081B	08/10/17 16:08	08/17/17 10:40	10.21g/5mL	10g/5mL	0.98
A7H0364-25	Soil	EPA 8081B	08/10/17 16:10	08/17/17 10:40	10.89g/5mL	10g/5mL	0.92
A7H0364-26	Soil	EPA 8081B	08/10/17 16:12	08/17/17 10:40	10.25g/5mL	10g/5mL	0.98

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080705							
A7H0364-01	Soil	EPA 8000C	08/10/17 11:10	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-02	Soil	EPA 8000C	08/10/17 12:08	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-03	Soil	EPA 8000C	08/10/17 13:55	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-04	Soil	EPA 8000C	08/10/17 14:21	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-05	Soil	EPA 8000C	08/10/17 15:40	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-06	Soil	EPA 8000C	08/10/17 16:14	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
Batch: 7080778							
A7H0364-07	Soil	EPA 8000C	08/10/17 11:02	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-08	Soil	EPA 8000C	08/10/17 11:04	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA

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Anderson Geological
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Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

SAMPLE PREPARATION INFORMATION

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A7H0364-09	Soil	EPA 8000C	08/10/17 11:06	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-10	Soil	EPA 8000C	08/10/17 11:08	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-15	Soil	EPA 8000C	08/10/17 13:47	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-16	Soil	EPA 8000C	08/10/17 13:49	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-17	Soil	EPA 8000C	08/10/17 13:51	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-18	Soil	EPA 8000C	08/10/17 13:53	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-23	Soil	EPA 8000C	08/10/17 16:06	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-24	Soil	EPA 8000C	08/10/17 16:08	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-25	Soil	EPA 8000C	08/10/17 16:10	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0364-26	Soil	EPA 8000C	08/10/17 16:12	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories



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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:50

Notes and Definitions

Qualifiers:

M-02 Due to matrix interference, this analyte cannot be accurately quantified. The reported result is estimated.

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- *** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

APEX LABS CHAIN OF CUSTODY

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Lab # A1H03104 COC 1 of 3

POF#

Company: <u>Anderson Geological</u>			Project Name: <u>Northstar</u>			Project # <u>1503.03</u>		
Address:			Phone:			Email:		
Sampled by: <u>E. Anderson</u>			Fax:			Project # <u>1503.03</u>		
Site Location: <u>WA</u>			Project Mgr: <u>Erik Anderson</u>			Project # <u>1503.03</u>		
Other:			Project Name: <u>Northstar</u>			Project # <u>1503.03</u>		
SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWPH-ID1	NWPH-ID2	NWPH-ID3
13B-S-COMP		8/14/17	11:10	S	1			
13B-N-COMP			12:08	S	1			
14A-S-COMP			13:35	S	1			
14A-N-COMP			14:21	S	1			
10C-S-COMP			15:40	S	1			
10C-N-COMP			16:14	S	1			
13B-SA			11:02	S	1			
13B-SB			11:04	S	1			
13B-SC			11:06	S	1			
13B-SD			11:08	S	1			

Normal Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 5 DAY

SAMPLES ARE HELD FOR 30 DAYS

RECEIVED BY: [Signature] Date: 8/14/17

Signature: Erik Anderson Date: 8/14/17

Printed Name: Erik Anderson Time: 12:50

Company: Ag1

Apex Laboratories

Darwin Thomas, Business Development Director

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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:50

CHAIN OF CUSTODY

APEX LABS Lab # ATH0304 COC 2 of 3

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological Project Mgr: Erik Anderson Project Name: Northstar Project # 1503.03

Address: _____ Phone: _____ Email: _____

Sampled by: E. Anderson

LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS		ANALYSIS REQUEST
				YES	NO	
13B-NA	09/07/2000		S	1		Z-002
13B-NB	12-02		S	1		1208-COLS
13B-NC	12-04		S	1		TOTAL DIS. TCLP
13B-ND	12-06		S	1		8 Ag, 24, 28, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114, 120
14A-SA	13-47		S	1		AL, SA, AN, BA, BE, CA, CR, CU, FE, NI, PB, SE, SI, SN, SO, ST, Tl, V, Zn
14A-SB	13-49		S	1		TCLP Metals (8)
14A-SC	13-51		S	1		RCA Metals (8)
14A-SD	13-53		S	1		600 TIO
14A-NA	13-55		S	1		8082 PCB
14A-NB	13-55		S	1		4270 SIM PAHs
	14-15		S	1		4270 SVOC
						8269 HTEX VOCs
						8269 HVOCs
						8269 RHM VOCs
						8269 VOCs, PHL, LM
						NWPH-CA
						NWPH-DX
						NWPH-CHD

Normal Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY **5 DAY** Other: _____

SPECIAL INSTRUCTIONS: _____

RECEIVED BY: _____ Date: _____ Time: _____

RECEIVED BY: _____ Date: _____ Time: _____

Signature: Erik Anderson Date: 09/11/17 Time: 12:50

Printed Name: Erik Anderson Time: _____ Company: AG-I

Apex Laboratories



Darwin Thomas, Business Development Director

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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:50

CHAIN OF CUSTODY

Lab # A1110314 coc 3 of 3

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological Project Mgr: Erik Anderson Project Name: Northstar Project # 1503.03

Address: _____ Phone: _____ Fax: _____ Email: _____

Sampled by: E. Anderson

Site Location: OR WA Other: _____

LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	ANALYSIS REQUEST	
					RCRA Metals (B)	TCLP Metals (B)
149-NC	8/10/17	14:17	S	1		
14A-MD		14:19	S	1		
10C-NA		16:06	S	1		
10C-NB		16:08	S	1		
10C-NC		16:10	S	1		
10C-MD		16:12	S	1		
10C-SA		15:52	S	1		
10C-SB		15:34	S	1		
10C-SC		15:36	S	1		
10C-SD		15:38	S	1		

Normal Turn Around Time (TAT) = 7-10 Business Days YES NO

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: _____

SPECIAL INSTRUCTIONS: _____

RECEIVED BY: _____ RECEIVED BY: _____

Signature: Erik Anderson Date: 8/10/17 Signature: _____ Date: _____

Printed Name: Erik Anderson Time: _____ Printed Name: _____ Time: _____

Company: AGI Company: _____

Apex Laboratories



Darwin Thomas, Business Development Director

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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:50

APEX LABS COOLER RECEIPT FORM

Client: Anderson Geological Element WO#: A7 H0364
 Project/Project #: Northstar 1503.03

Delivery info:

Date/Time Received: 8/11/17 @ 1252 By: JS
 Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Inspected by: JS : 8/11/17 @ 1322

Chain of Custody Included? Yes No Custody Seals? Yes No

Signed/Dated by Client? Yes No

Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>1.3</u>						
Received on Ice? (Y/N)	<u>(Y)</u>						
Temp. Blanks? (Y/N)	<u>(N)</u>						
Ice Type: (Gel/Real/Other)	<u>(Real)</u>						
Condition:	<u>good</u>						

Cooler out of temp? (Y/N) Possible reason why: _____

If some coolers are in temp and some out, was a green dot applied to out of temperature samples? Yes/No/NA (NA)

Samples Inspection: Inspected by: (S) : 8/11/17 @ 1446

All Samples Intact? Yes No Comments: _____

Bottle Labels/COCs agree? Yes No Comments: Containers for 13B-NA, 13B-NB + 13B-NC read D of 8/09/17, no T on containers. 14A-S-comp

Containers/Volumes Received Appropriate for Analysis? Yes No Comments: _____

Do VOA Vials have Visible Headspace? Yes No NA

Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes No NA

Comments: _____

Additional Information: no D on Cont. 10C-N-COMP no D on Cont.

Labeled by: (S) Witness: CFH Cooler Inspected by: (S) See Project Contact Form: Y



Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Sunday, September 3, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

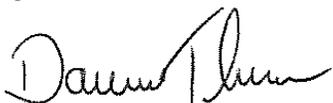
RE: Northstar / 1503.03

Enclosed are the results of analyses for work order A7H0393, which was received by the laboratory on 8/14/2017 at 12:00:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:59

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
9D-N-Comp	A7H0393-01	Soil	08/12/17 10:49	08/14/17 12:00
9D-S-Comp	A7H0393-02	Soil	08/12/17 11:08	08/14/17 12:00
9A-N-Comp	A7H0393-03	Soil	08/12/17 13:30	08/14/17 12:00
9A-S-Comp	A7H0393-04	Soil	08/12/17 13:44	08/14/17 12:00
10B-N-Comp	A7H0393-05	Soil	08/12/17 11:55	08/14/17 12:00
10B-S-Comp	A7H0393-06	Soil	08/12/17 12:13	08/14/17 12:00
9B-N-Comp	A7H0393-39	Soil	08/14/17 09:49	08/14/17 12:00
9B-S-Comp	A7H0393-40	Soil	08/14/17 10:06	08/14/17 12:00

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
9D-N-Comp (A7H0393-01RE2)			Matrix: Soil		Batch: 7080669			
Dieldrin	0.0968	---	0.00515	mg/kg dry	5	08/16/17 12:02	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 63 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			94 %	Limits: 65-151 %	"	"	"	
9D-S-Comp (A7H0393-02)			Matrix: Soil		Batch: 7080669			
Dieldrin	0.0717	---	0.00102	mg/kg dry	1	08/15/17 14:22	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 79 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			103 %	Limits: 65-151 %	"	"	"	
9A-N-Comp (A7H0393-03)			Matrix: Soil		Batch: 7080669			
Dieldrin	0.0521	---	0.000982	mg/kg dry	1	08/15/17 14:40	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 73 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			94 %	Limits: 65-151 %	"	"	"	
9A-S-Comp (A7H0393-04RE1)			Matrix: Soil		Batch: 7080669			
Dieldrin	0.0710	---	0.00216	mg/kg dry	2	08/16/17 12:37	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 71 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			102 %	Limits: 65-151 %	"	"	"	
10B-N-Comp (A7H0393-05RE1)			Matrix: Soil		Batch: 7080669			
Dieldrin	0.00518	---	0.00106	mg/kg dry	1	08/16/17 12:55	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 83 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			101 %	Limits: 65-151 %	"	"	"	
10B-S-Comp (A7H0393-06)			Matrix: Soil		Batch: 7080669			
Dieldrin	ND	---	0.00116	mg/kg dry	1	08/15/17 16:07	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 80 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			87 %	Limits: 65-151 %	"	"	"	
9B-N-Comp (A7H0393-39RE1)			Matrix: Soil		Batch: 7080669			
Dieldrin	0.0384	---	0.00215	mg/kg dry	2	08/16/17 13:12	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 82 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			103 %	Limits: 65-151 %	"	"	"	
9B-S-Comp (A7H0393-40RE2)			Matrix: Soil		Batch: 7080669			
Dieldrin	0.0701	---	0.00533	mg/kg dry	5	08/16/17 13:30	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 84 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			104 %	Limits: 65-151 %	"	"	"	

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:59

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
9D-N-Comp (A7H0393-01)			Matrix: Soil		Batch: 7080705			
% Solids	87.9	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
9D-S-Comp (A7H0393-02)			Matrix: Soil		Batch: 7080705			
% Solids	91.5	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
9A-N-Comp (A7H0393-03)			Matrix: Soil		Batch: 7080705			
% Solids	88.5	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
9A-S-Comp (A7H0393-04)			Matrix: Soil		Batch: 7080705			
% Solids	87.4	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
10B-N-Comp (A7H0393-05)			Matrix: Soil		Batch: 7080705			
% Solids	87.1	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
10B-S-Comp (A7H0393-06)			Matrix: Soil		Batch: 7080705			
% Solids	84.7	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
9B-N-Comp (A7H0393-39)			Matrix: Soil		Batch: 7080705			
% Solids	85.9	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	
9B-S-Comp (A7H0393-40)			Matrix: Soil		Batch: 7080705			
% Solids	83.9	---	1.00	% by Weight	1	08/16/17 07:47	EPA 8000C	

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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080669 - EPA 3546						Soil						
Blank (7080669-BLK1)						Prepared: 08/15/17 07:18 Analyzed: 08/15/17 13:12						
EPA 8081B												
Dieldrin	ND	---	0.000833	mg/kg wet	1	---	---	---	---	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 101 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>100 %</i>	<i>65-151 %</i>		<i>"</i>						
LCS (7080669-BS1)						Prepared: 08/15/17 07:18 Analyzed: 08/15/17 13:30						
EPA 8081B												
Dieldrin	0.0543	---	0.00100	mg/kg wet	1	0.0500	---	109	56-136%	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 88 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>91 %</i>	<i>65-151 %</i>		<i>"</i>						
Duplicate (7080669-DUP3)						Prepared: 08/15/17 07:18 Analyzed: 08/16/17 12:19						
QC Source Sample: 9D-N-Comp (A7H0393-01RE2)												
EPA 8081B												
Dieldrin	0.128	---	0.00510	mg/kg dry	5	---	0.0968	---	---	28	30%	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 80 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 5x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>108 %</i>	<i>65-151 %</i>		<i>"</i>						
Matrix Spike (7080669-MS3)						Prepared: 08/15/17 07:18 Analyzed: 08/16/17 13:47						
QC Source Sample: 9B-S-Comp (A7H0393-40RE2)												
EPA 8081B												
Dieldrin	0.118	---	0.00538	mg/kg dry	5	0.0538	0.0701	89	56-136%	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 87 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 5x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>98 %</i>	<i>65-151 %</i>		<i>"</i>						

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:59

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080705 - Total Solids (Dry Weight)						Soil						
Duplicate (7080705-DUP3)						Prepared: 08/15/17 14:46 Analyzed: 08/16/17 07:47						
QC Source Sample: 10B-N-Comp (A7H0393-05)												
EPA 8000C												
% Solids	87.1	---	1.00	% by Weight	1	---	87.1	---	---	0.008	10%	

Apex Laboratories



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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:59

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080669							
A7H0393-01RE2	Soil	EPA 8081B	08/12/17 10:49	08/15/17 07:18	11.05g/5mL	10g/5mL	0.91
A7H0393-02	Soil	EPA 8081B	08/12/17 11:08	08/15/17 07:18	10.71g/5mL	10g/5mL	0.93
A7H0393-03	Soil	EPA 8081B	08/12/17 13:30	08/15/17 07:18	11.51g/5mL	10g/5mL	0.87
A7H0393-04RE1	Soil	EPA 8081B	08/12/17 13:44	08/15/17 07:18	10.58g/5mL	10g/5mL	0.95
A7H0393-05RE1	Soil	EPA 8081B	08/12/17 11:55	08/15/17 07:18	10.82g/5mL	10g/5mL	0.92
A7H0393-06	Soil	EPA 8081B	08/12/17 12:13	08/15/17 07:18	10.2g/5mL	10g/5mL	0.98
A7H0393-39RE1	Soil	EPA 8081B	08/14/17 09:49	08/15/17 07:18	10.85g/5mL	10g/5mL	0.92
A7H0393-40RE2	Soil	EPA 8081B	08/14/17 10:06	08/15/17 07:18	11.19g/5mL	10g/5mL	0.89

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080705							
A7H0393-01	Soil	EPA 8000C	08/12/17 10:49	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0393-02	Soil	EPA 8000C	08/12/17 11:08	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0393-03	Soil	EPA 8000C	08/12/17 13:30	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0393-04	Soil	EPA 8000C	08/12/17 13:44	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0393-05	Soil	EPA 8000C	08/12/17 11:55	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0393-06	Soil	EPA 8000C	08/12/17 12:13	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0393-39	Soil	EPA 8000C	08/14/17 09:49	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA
A7H0393-40	Soil	EPA 8000C	08/14/17 10:06	08/15/17 14:46	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:59

Notes and Definitions

Qualifiers:

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- *** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:59

CHAIN OF CUSTODY

Lab # A740997 CUC 1 of 4

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological Project Mgr: Erik Anderson Project Name: Northstar Project # 1503.03

Address: _____ Phone: _____ Email: _____

Sampled by: Anderson

SAMPLE ID	LAW ID #	DATE	TIME	MATRIX	# OF CONTAINERS	ANALYSIS REQUEST	
						YES	NO
9D-N-COMP		9/14/17	10:49	S	1		1200-Z
9D-S-COMP			11:08	S	1		1200-COLS
9A-N-COMP			13:30	S	1		TOTAL DISS TCTP
9A-S-COMP			13:44	S	1		Ag, Sn, TE, V, Pb
10B-N-COMP			11:55	S	1		As, Sb, As, Ba, Bi, Cd, Cr, Cu, Fe, Ni, Hg, Mn, Mo, Se, Zn
10B-S-COMP			12:13	S	1		TCLP Metals (8)
9D-NA			10:41	S	1		RCRA Metals (8)
9D-NB			10:43	S	1		609 TIO
9D-NC			10:45	S	1		8082 PCBs
9D-ND			10:47	S	1		8270 SIM PAHs
							8270 SVOC
							8260 BTEX VOCs
							8260 HVOCs
							8260 RBDN VOCs
							8260 VOCs Full List
							NMTH-Gs
							NMTH-Ds
							NMTH-HCID

SPECIAL INSTRUCTIONS: Need results by wed. afternoon (9/16/17)

TAT Requested (circle): 2 Day 1 Day 3 Day 4 DAY 5 DAY Other: _____

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Erik Anderson Date: 9/14/17 Signature: [Signature] Time: 12:00

RECEIVED BY: _____ Date: _____ Signature: _____ Time: _____

Company: AGI Company: APEX

Apex Laboratories

[Signature]

Darwin Thomas, Business Development Director

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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:59

CHAIN OF CUSTODY

Lab # 1540293 Project # 1503.00
COC 2 of 84

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological Project Mgr: Erik Anderson Project Name: Northstar PO#

Address: _____ Phone: _____ Fax: _____ Email: _____

Sampled by: E. Anderson

Site Location: OR WA
Other: _____

LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	ANALYSIS REQUEST			
					NWTFHClD	NWTFHCS	NWTFHCA	8560 VOCs Full Lab
9D-SA	11-02-17	11:00	S	1				
9D-SB	11-02-17	11:02	S	1				
9D-SC	11-04-17	11:04	S	1				
9D-SD	11-06-17	11:06	S	1				
9A-NA	13-22-17	13:22	S	1				
9A-NB	13-24-17	13:24	S	1				
9A-NC	13-26-17	13:26	S	1				
9A-ND	13-28-17	13:28	S	1				
9A-SA	13-36-17	13:36	S	1				
9A-SB	13-38-17	13:38	S	1				

Normal Turn Around Time (TAT) is 10 Business Days YES NO

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: _____

SPECIAL INSTRUCTIONS: HELD

RELINQUISHED BY: E. Anderson Date: 9/11/17 Signature: [Signature] Date: _____

RECEIVED BY: _____ Signature: _____ Date: _____

Printed Name: Erik Anderson Title: 12:00 Printed Name: [Signature] Title: 1700

Company: AGI Company: Apex

Apex Laboratories

[Signature]

Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:59

CHAIN OF CUSTODY

Company: **Anderson Geological** Project Mgr: **Erik Anderson** Project # **1503.03**

Address:		Phone:		Fax:		Email:	
Company: Anderson Geological		Project Mgr: Erik Anderson		Project Name: Northstar		Project # 1503.03	
Site Location: OR W/A		DATE		TIME		LAB ID #	
Other:		DATE		TIME		LAB ID #	
SAMPLE ID		DATE		TIME		LAB ID #	
1 9A-5C		8/12/17		13:40		S	
2 9A-5D		8/12/17		13:42		S	
3 10B-5A		8/12/17		11:47		S	
4 10B-5B		8/12/17		11:44		S	
5 10B-5C		8/12/17		11:51		S	
6 10B-5D		8/12/17		11:53		S	
7 10B-5A		8/12/17		12:05		S	
8 10B-5B		8/12/17		12:07		S	
9 10B-5C		8/12/17		12:08		S	
10 10B-5D		8/12/17		12:09		S	
Normal Turn Around Time (TAT) = 10 Business Days		YES		NO			
TAT Requested (circle)		1 Day		2 Day		3 Day	
		4 DAY		5 DAY		Other:	
SPECIAL INSTRUCTIONS:		YES		NO			
RECEIVED BY:		DATE		TIME		LAB ID #	
Signature: Erik Anderson		Date: 8/14/17		Time: 12:00		LAB ID #	
Printed Name: Erik Anderson		Date: 8/14/17		Time: 12:00		LAB ID #	
Company: AGI		Signature: [Signature]		Date: 8/14/17		LAB ID #	
		Printed Name: [Name]		Time: 12:00		LAB ID #	
		Company: AGA					

Apex Laboratories

[Signature]

Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.03
Project Manager: Erik Anderson

Reported:
09/03/17 12:59

COC 4 of 4

Lab # AH0913

CHAIN OF CUSTODY

APEX LABS

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological		Project Name: Northstar		Project #	
Address:		Phone:		Email:	
Sampled by: E. Anderson		Project Mgr: Erik Anderson			
Site Location: OR WA		ANALYSIS REQUEST			
Other:		AL SB, AC, BA, BC, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ	TCAP Metals (B)	TCRA Metals (B)	600 TIO
SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS
9B-NA		8/14/17	9:41	S	1
9B-NB		9:43	9:43	S	1
9B-NC		9:45	9:45	S	1
9B-ND		9:47	9:47	S	1
9B-NE		9:58	9:58	S	1
9B-NF		10:00	10:00	S	1
9B-NG		10:02	10:02	S	1
9B-NH-CC-MP		9:49	9:49	S	1
9B-S-CC-MP		10:06	10:06	S	1
Normal Turn Around Time (TAT) = 7-10 Business Days					
TAT Requested (circle)		1 Day	3 Day	5 Day	Other:
SPECIAL INSTRUCTIONS: Need results by wed. afternoon (8/16/17)					
RECEIVED BY: Erik Anderson Date: 8/14/17 Signature: Erik Anderson					
RECEIVED BY: [Signature] Date: 8/16/17 Signature: [Signature]					
Printed Name: Erik Anderson Time: 12:00 Printed Name: Erik Anderson Time: 12:00					
Company: AGI Company: Apex					

Apex Laboratories



Darwin Thomas, Business Development Director

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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.03
 Project Manager: Erik Anderson

Reported:
 09/03/17 12:59

APEX LABS COOLER RECEIPT FORM

Client: Anderson Geological Element WO#: A7 H0393
 Project/Project #: Northstar

Delivery info:

Date/Time Received: 8/14/17 @ 1200 By: KM
 Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Inspected by: KM : 8/14/17 @ 1200

Chain of Custody Included? Yes No Custody Seals? Yes No
 Signed/Dated by Client? Yes No
 Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>2.4</u>						
Received on Ice? (Y/N)	<u>(Y)</u>						
Temp. Blanks? (Y/N)	<u>(N)</u>						
Ice Type: (Gel/Real/Other)	<u>(G)</u>						
Condition:	<u>good</u>						

Cooler out of temp? (Y/N) Possible reason why: (N)
 If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA (NA)

Samples Inspection: Inspected by: AKK : 8/14/17 @ 1245
AKK 8/14/17

All Samples Intact? Yes No Comments: _____

Bottle Labels/COCs agree? Yes No Comments: No T on Cont.

Containers/Volumes Received Appropriate for Analysis? Yes No Comments: _____

Do VOA Vials have Visible Headspace? Yes No NA

Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes No NA

Comments: _____

Additional Information: _____

Labeled by: AKK Witness: (Signature) Cooler Inspected by: AKK See Project Contact Form: Y

Darwin Thomas

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Sunday, September 3, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

RE: Northstar / 1503.00

Enclosed are the results of analyses for work order A7H0486, which was received by the laboratory on 8/16/2017 at 2:35:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.00
Project Manager: Erik Anderson

Reported:
09/03/17 14:03

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
8A-N-Comp	A7H0486-01	Soil	08/16/17 09:04	08/16/17 14:35
8A-S-Comp	A7H0486-02	Soil	08/16/17 09:16	08/16/17 14:35
33A-N-Comp	A7H0486-03	Soil	08/16/17 11:06	08/16/17 14:35
33A-S-Comp	A7H0486-04	Soil	08/16/17 11:24	08/16/17 14:35
33B-N-Comp	A7H0486-05	Soil	08/16/17 11:50	08/16/17 14:35
33B-S-Comp	A7H0486-06	Soil	08/16/17 12:30	08/16/17 14:35

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.00
Project Manager: Erik Anderson

Reported:
09/03/17 14:03

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
8A-N-Comp (A7H0486-01)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0757	---	0.00108	mg/kg dry	1	08/18/17 12:49	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 81 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>98 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
8A-S-Comp (A7H0486-02)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0271	---	0.00112	mg/kg dry	1	08/18/17 13:24	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 79 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>88 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
33A-N-Comp (A7H0486-03)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.00857	---	0.00114	mg/kg dry	1	08/18/17 14:27	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 81 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>93 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
33A-S-Comp (A7H0486-04)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.00787	---	0.00112	mg/kg dry	1	08/18/17 14:45	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 73 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>86 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
33B-N-Comp (A7H0486-05)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0224	---	0.00110	mg/kg dry	1	08/18/17 15:02	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 76 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>89 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
33B-S-Comp (A7H0486-06)			Matrix: Soil		Batch: 7080757			
Dieldrin	0.0320	---	0.00110	mg/kg dry	1	08/18/17 15:20	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 84 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>94 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.00
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:03

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
8A-N-Comp (A7H0486-01)			Matrix: Soil		Batch: 7080778			
% Solids	91.0	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
8A-S-Comp (A7H0486-02)			Matrix: Soil		Batch: 7080778			
% Solids	87.5	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
33A-N-Comp (A7H0486-03)			Matrix: Soil		Batch: 7080778			
% Solids	86.2	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
33A-S-Comp (A7H0486-04)			Matrix: Soil		Batch: 7080778			
% Solids	88.3	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
33B-N-Comp (A7H0486-05)			Matrix: Soil		Batch: 7080778			
% Solids	90.0	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	
33B-S-Comp (A7H0486-06)			Matrix: Soil		Batch: 7080778			
% Solids	88.7	---	1.00	% by Weight	1	08/18/17 07:29	EPA 8000C	

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.00
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:03

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080757 - EPA 3546						Soil						
Blank (7080757-BLK1)						Prepared: 08/17/17 07:57 Analyzed: 08/18/17 12:05						
EPA 8081B												
Dieldrin	ND	---	0.000909	mg/kg wet	1	---	---	---	---	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 105 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>123 %</i>		<i>65-151 %</i>		<i>"</i>					
LCS (7080757-BS1)						Prepared: 08/17/17 07:57 Analyzed: 08/18/17 12:22						
EPA 8081B												
Dieldrin	0.0591	---	0.00100	mg/kg wet	1	0.0500	---	118	56-136%	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 90 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>109 %</i>		<i>65-151 %</i>		<i>"</i>					
Duplicate (7080757-DUP1)						Prepared: 08/17/17 07:57 Analyzed: 08/18/17 13:07						
QC Source Sample: 8A-N-Comp (A7H0486-01)												
EPA 8081B												
Dieldrin	0.0675	---	0.00109	mg/kg dry	1	---	0.0757	---	---	11	30%	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 79 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>92 %</i>		<i>65-151 %</i>		<i>"</i>					
Matrix Spike (7080757-MS1)						Prepared: 08/17/17 07:57 Analyzed: 08/18/17 15:37						
QC Source Sample: 33B-S-Comp (A7H0486-06)												
EPA 8081B												
Dieldrin	0.0884	---	0.00111	mg/kg dry	1	0.0553	0.0320	102	56-136%	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 86 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>103 %</i>		<i>65-151 %</i>		<i>"</i>					

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.00 Project Manager: Erik Anderson	Reported: 09/03/17 14:03
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QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080778 - Total Solids (Dry Weight)							Soil					

Apex Laboratories



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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.00
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:03

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080757							
A7H0486-01	Soil	EPA 8081B	08/16/17 09:04	08/17/17 07:57	10.19g/5mL	10g/5mL	0.98
A7H0486-02	Soil	EPA 8081B	08/16/17 09:16	08/17/17 07:57	10.17g/5mL	10g/5mL	0.98
A7H0486-03	Soil	EPA 8081B	08/16/17 11:06	08/17/17 07:57	10.2g/5mL	10g/5mL	0.98
A7H0486-04	Soil	EPA 8081B	08/16/17 11:24	08/17/17 07:57	10.16g/5mL	10g/5mL	0.98
A7H0486-05	Soil	EPA 8081B	08/16/17 11:50	08/17/17 07:57	10.13g/5mL	10g/5mL	0.99
A7H0486-06	Soil	EPA 8081B	08/16/17 12:30	08/17/17 07:57	10.23g/5mL	10g/5mL	0.98

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080778							
A7H0486-01	Soil	EPA 8000C	08/16/17 09:04	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0486-02	Soil	EPA 8000C	08/16/17 09:16	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0486-03	Soil	EPA 8000C	08/16/17 11:06	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0486-04	Soil	EPA 8000C	08/16/17 11:24	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0486-05	Soil	EPA 8000C	08/16/17 11:50	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0486-06	Soil	EPA 8000C	08/16/17 12:30	08/17/17 12:17	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.00
Project Manager: Erik Anderson

Reported:
09/03/17 14:03

Notes and Definitions

Qualifiers:

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch
QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank
Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- *** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.00
Project Manager: Erik Anderson

Reported:
09/03/17 14:03

CHAIN OF CUSTODY

Lab # APX0186 Project # 1503.00
COC 1 of 3

Company: Anderson Geological Project Mgr: Erik Anderson Project Name: Northstar POB

Address: _____ Phone: _____ Fax: _____ Email: _____

Sampled by: E Anderson

Site Location: WA Other: _____

SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	ANALYSIS REQUEST	
						YES	NO
BA-N-COMP		8/16/17	9:04	S	1		
BA-S-COMP		9-16	S	S	1		
33A-N-COMP		11-06	S	S	1		
33A-S-COMP		11-24	S	S	1		
33B-N-COMP		11-30	S	S	1		
33B-S-COMP		8-36	S	S	1		
BA-NA		8-58	S	S	1		
BA-NB		7-00	S	S	1		
BA-NC		7-02	S	S	1		
BA-ND							

ANALYSIS REQUEST

1200-Z		X	
1200-COLS		X	
TC.P Metals (B)		X	
RC.RA Metals (B)		X	
600 TTO		X	
8082 PCBs		X	
8170 SIM PAHS		X	
8170 SVOC		X	
8160 BTEX VOCs		X	
8160 HVOCS		X	
8160 RBDV VOCs		X	
8160 VOCs PAH LAB		X	
NWTF-GS		X	
NWTF-DS		X	
NWTF-DCID		X	

SPECIAL INSTRUCTIONS:

Normal Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY **5 DAY** Other: _____

SAMPLES ARE HELD FOR 30 DAYS

RELEASER(S): Erik Anderson RECEIVED BY: _____
Signature: _____ Date: 8/16/17 Signature: _____ Date: _____
Printed Name: Erik Anderson Printed Name: Amssa Kefen Time: 14:32 Time: 14:25
Company: AGI Company: Apex Labs

Apex Laboratories



Darwin Thomas, Business Development Director

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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.00
Project Manager: Erik Anderson

Reported:
09/03/17 14:03

CHAIN OF CUSTODY

Lab # A240480 coc 2 of 3

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological Project Mgr: Erik Anderson Project Name: Northstar Project # 1503.00

Address: _____ Phone: _____ Email: _____

Sampled by: _____

Site Location: WA Other: _____

SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	SPECIAL INSTRUCTIONS:	
						YES	NO
BA-SA		8/17/17	9:00	S	1		
BA-SB		9/10		S	1		
BA-SC		9/12		S	1		
BA-SD		9/14		S	1		
33A-NA		10/24		S	1		
33A-NB		11/02		S	1		
33A-NC		11/02		S	1		
33A-ND		11/04		S	1		
33A-SE		11/16		S	1		
33A-SB		11/16		S	1		

Normal Turn Around Time (TAT) = 7-10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY **5 DAY** Other: _____

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Erik Anderson Date: 8/16/17 Signature: [Signature] Date: 8/16/17 Signature: _____
 Printed Name: Erik Anderson Time: 14:35 Printed Name: _____ Time: _____
 Company: AG Company: Apex Labs

ANALYSIS REQUEST

AL SR, AN, BA, BS, CA, CR, CS, CU, FE, NI, ZN, AS, NA, TR, V, W, Pb, Ag, Ni, Mn, Mo, Se, Cd, Cr, Co, Cu, Fe, Ni, Zn, Hg, Mg, Na, Pb, Tl, U, Zn	
TOTAL DISS TCLP	
1200-COLS	
1200-Z	

RCRA Metals (B) _____
 TCLP Metals (B) _____
 600 TTO _____
 8082 PCBs _____
 8270 SIM PAHs _____
 8270 SVOC _____
 8260 BTEX _____
 8260 RBDN VOCs _____
 8260 VOC _____
 NWTPH-GS _____
 NWTPH-D _____
 NWTPH-CID _____

Apex Laboratories

[Signature]

Darwin Thomas, Business Development Director

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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.00
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:03

CHAIN OF CUSTODY

Lab # 150300 COC # 3 of 3

Project Name: Northstar

Project # 1503.00

Company: Anderson Geological Project Mgr: Erik Anderson Phone: _____ Fax: _____

LAB ID #	DATE	TIME	# OF CONTAINERS	MATRIX	ANALYSIS REQUEST	RECEIVED BY:
53A-5C	8/16/17	11:20	5	1	1200-Z	
53A-5D	11-22		5	1	1200-COLS	
53B-NA	11-22		5	1	TOTAL DISS TCFP	
53B-NB	11-22		5	1	As Ag, Na, Fe, Pb, Cu, Cr, Ni, Mn, Hg, Cd, Zn, Co, Ni, Cr, Pb, Cu, Fe, Ni, Mn, Hg, Cd, Zn, Co	
53B-NC	11-22		5	1	TCFP Metals (B)	
53B-ND	11-22		5	1	RCA Metals (B)	
53B-5A	12-22		5	1	608 TFO	
53B-5B	12-22		5	1	8082 PCBs	
53B-5C	12-22		5	1	8270 SIM PAHs	
53B-5D	12-22		5	1	8270 SVOC	
					8260 BTEX	
					8260 RBDN VOCs	
					8260 VOC	
					NWTR-GA	
					NWTR-DA	
					NWTR-HCID	

Normal Turn Around Time (TAT) = 7-10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY **5 DAY** Other: _____

SPECIAL INSTRUCTIONS:

RECEIVED BY: _____ Date: _____ Signature: _____

Apex Laboratories



Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.00
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:03

APEX LABS COOLER RECEIPT FORM

Client: Anderson Geological Element WO#: A7 #0456
 Project/Project #: North Star / 1503.00

Delivery info:

Date/Time Received: 8/16/17 @ 1435 By: AKK
 Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other _____

Cooler Inspection Inspected by: AKK : 8/16/17 @ 1435

Chain of Custody Included? Yes No Custody Seals? Yes No

Signed/Dated by Client? Yes No

Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>59</u>						
Received on Ice? (Y/N)	<u>(Y)</u>						
Temp. Blanks? (Y/N)	<u>(N)</u>						
Ice Type: (Gel/Real/Other)	<u>(Gel)</u>						
Condition:	<u>good</u>						
Cooler out of temp? (Y/N)	<u>(N)</u>						
If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA <u>(NA)</u>							
Samples Inspection:	Inspected by: <u>AKK</u> : <u>8/16/17 @ 1435</u>						
All Samples Intact? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comments:							
Bottle Labels/COCs agree? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comments:	<u>No Ton Cont.</u>						
Containers/Volumes Received Appropriate for Analysis? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comments:							
Do VOA Vials have Visible Headspace? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>							
Comments:							
Water Samples: pH Checked and Appropriate (except VOAs): Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>							
Comments:							
Additional Information:							
Labeled by: <u>AKK</u>	Witness: <u>KAZ</u>	Cooler Inspected by: <u>AKK</u>	See Project Contact Form: Y				



Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Sunday, September 3, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

RE: Northstar / [none]

Enclosed are the results of analyses for work order A7H0536, which was received by the laboratory on 8/17/2017 at 3:03:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:15

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
33D-S-Comp	A7H0536-01	Soil	08/17/17 11:16	08/17/17 15:03
33D-N-Comp	A7H0536-02	Soil	08/17/17 11:00	08/17/17 15:03
33C-N-Comp	A7H0536-03	Soil	08/17/17 12:00	08/17/17 15:03
33C-S-Comp	A7H0536-04	Soil	08/17/17 12:16	08/17/17 15:03
15A-N-Comp	A7H0536-05	Soil	08/17/17 13:18	08/17/17 15:03
15A-S-Comp	A7H0536-06	Soil	08/17/17 13:34	08/17/17 15:03
33D-SA	A7H0536-11	Soil	08/17/17 11:08	08/17/17 15:03
33D-SB	A7H0536-12	Soil	08/17/17 11:10	08/17/17 15:03
33D-SC	A7H0536-13	Soil	08/17/17 11:12	08/17/17 15:03
33D-SD	A7H0536-14	Soil	08/17/17 11:14	08/17/17 15:03
15A-NA	A7H0536-23	Soil	08/17/17 13:10	08/17/17 15:03
15A-NB	A7H0536-24	Soil	08/17/17 13:12	08/17/17 15:03
15A-NC	A7H0536-25	Soil	08/17/17 13:14	08/17/17 15:03
15A-ND	A7H0536-26	Soil	08/17/17 13:16	08/17/17 15:03
15A-SA	A7H0536-27	Soil	08/17/17 13:26	08/17/17 15:03
15A-SB	A7H0536-28	Soil	08/17/17 13:28	08/17/17 15:03
15A-SC	A7H0536-29	Soil	08/17/17 13:30	08/17/17 15:03
15A-SD	A7H0536-30	Soil	08/17/17 13:32	08/17/17 15:03

Apex Laboratories



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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:15

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting			Date Analyzed	Method	Notes
			Limit	Units	Dilution			
33D-S-Comp (A7H0536-01)			Matrix: Soil		Batch: 7080797			
Dieldrin	0.0197	---	0.00104	mg/kg dry	1	08/21/17 12:10	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 70 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			81 %	Limits: 65-151 %	"	"	"	
33D-N-Comp (A7H0536-02)			Matrix: Soil		Batch: 7080797			
Dieldrin	ND	---	0.00114	mg/kg dry	1	08/21/17 12:45	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 72 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			82 %	Limits: 65-151 %	"	"	"	
33C-N-Comp (A7H0536-03)			Matrix: Soil		Batch: 7080797			
Dieldrin	0.00690	---	0.00108	mg/kg dry	1	08/21/17 13:02	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 71 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			81 %	Limits: 65-151 %	"	"	"	
33C-S-Comp (A7H0536-04)			Matrix: Soil		Batch: 7080797			
Dieldrin	ND	---	0.00106	mg/kg dry	1	08/21/17 13:20	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 70 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			76 %	Limits: 65-151 %	"	"	"	
15A-N-Comp (A7H0536-05)			Matrix: Soil		Batch: 7080797			
Dieldrin	0.0118	---	0.00103	mg/kg dry	1	08/21/17 13:37	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 62 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			78 %	Limits: 65-151 %	"	"	"	
15A-S-Comp (A7H0536-06)			Matrix: Soil		Batch: 7080797			
Dieldrin	0.0198	---	0.00106	mg/kg dry	1	08/21/17 13:55	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 61 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			77 %	Limits: 65-151 %	"	"	"	
33D-SA (A7H0536-11)			Matrix: Soil		Batch: 7081015			
Dieldrin	0.00411	---	0.00101	mg/kg dry	1	08/29/17 16:01	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 82 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			86 %	Limits: 65-151 %	"	"	"	
33D-SB (A7H0536-12)			Matrix: Soil		Batch: 7081015			
Dieldrin	ND	---	0.000957	mg/kg dry	1	08/29/17 16:36	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 68 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			76 %	Limits: 65-151 %	"	"	"	

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:15

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting			Date Analyzed	Method	Notes
			Limit	Units	Dilution			
33D-SC (A7H0536-13)			Matrix: Soil		Batch: 7081015			
Dieldrin	ND	---	0.000980	mg/kg dry	1	08/29/17 16:54	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 67 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			78 %	Limits: 65-151 %	"	"	"	
33D-SD (A7H0536-14)			Matrix: Soil		Batch: 7081015			
Dieldrin	0.0933	---	0.000968	mg/kg dry	1	08/29/17 17:11	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 71 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			85 %	Limits: 65-151 %	"	"	"	
15A-NA (A7H0536-23)			Matrix: Soil		Batch: 7081015			
Dieldrin	ND	---	0.00100	mg/kg dry	1	08/29/17 17:29	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 63 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			80 %	Limits: 65-151 %	"	"	"	
15A-NB (A7H0536-24)			Matrix: Soil		Batch: 7081015			
Dieldrin	0.00987	---	0.000964	mg/kg dry	1	08/29/17 18:21	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 70 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			87 %	Limits: 65-151 %	"	"	"	
15A-NC (A7H0536-25)			Matrix: Soil		Batch: 7081015			
Dieldrin	0.0144	---	0.000978	mg/kg dry	1	08/29/17 18:39	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 73 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			80 %	Limits: 65-151 %	"	"	"	
15A-ND (A7H0536-26)			Matrix: Soil		Batch: 7081015			
Dieldrin	0.0625	---	0.00104	mg/kg dry	1	08/29/17 18:56	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 75 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			92 %	Limits: 65-151 %	"	"	"	
15A-SA (A7H0536-27)			Matrix: Soil		Batch: 7081015			
Dieldrin	0.0475	---	0.00102	mg/kg dry	1	08/29/17 19:14	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 84 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			98 %	Limits: 65-151 %	"	"	"	
15A-SB (A7H0536-28)			Matrix: Soil		Batch: 7081015			
Dieldrin	0.00732	---	0.000947	mg/kg dry	1	08/29/17 19:31	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 75 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			94 %	Limits: 65-151 %	"	"	"	

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:15

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
15A-SC (A7H0536-29)			Matrix: Soil		Batch: 7081015			
Dieldrin	0.00647	---	0.000987	mg/kg dry	1	08/29/17 19:48	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 79 %</i>	<i>Limits: 42-129 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>107 %</i>	<i>Limits: 65-151 %</i>	"	"	"	
15A-SD (A7H0536-30)			Matrix: Soil		Batch: 7081015			
Dieldrin	0.0576	---	0.00103	mg/kg dry	1	08/29/17 20:06	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 74 %</i>	<i>Limits: 42-129 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>98 %</i>	<i>Limits: 65-151 %</i>	"	"	"	

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:15

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight								
Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
33D-S-Comp (A7H0536-01)			Matrix: Soil	Batch: 7080807				
% Solids	89.4	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	
33D-N-Comp (A7H0536-02)			Matrix: Soil	Batch: 7080807				
% Solids	85.2	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	
33C-N-Comp (A7H0536-03)			Matrix: Soil	Batch: 7080807				
% Solids	90.0	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	
33C-S-Comp (A7H0536-04)			Matrix: Soil	Batch: 7080807				
% Solids	88.1	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	
15A-N-Comp (A7H0536-05)			Matrix: Soil	Batch: 7080807				
% Solids	91.1	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	
15A-S-Comp (A7H0536-06)			Matrix: Soil	Batch: 7080807				
% Solids	90.7	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	
33D-SA (A7H0536-11)			Matrix: Soil	Batch: 7081020				
% Solids	87.2	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	
33D-SB (A7H0536-12)			Matrix: Soil	Batch: 7081020				
% Solids	89.5	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	
33D-SC (A7H0536-13)			Matrix: Soil	Batch: 7081020				
% Solids	90.5	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	
33D-SD (A7H0536-14)			Matrix: Soil	Batch: 7081020				
% Solids	89.6	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	
15A-NA (A7H0536-23)			Matrix: Soil	Batch: 7081020				
% Solids	87.9	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	
15A-NB (A7H0536-24)			Matrix: Soil	Batch: 7081020				
% Solids	92.8	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	
15A-NC (A7H0536-25)			Matrix: Soil	Batch: 7081020				
% Solids	94.0	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	
15A-ND (A7H0536-26)			Matrix: Soil	Batch: 7081020				
% Solids	89.0	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	
15A-SA (A7H0536-27)			Matrix: Soil	Batch: 7081020				
% Solids	89.9	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	
15A-SB (A7H0536-28)			Matrix: Soil	Batch: 7081020				
% Solids	93.0	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	

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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:15

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
15A-SC (A7H0536-29)			Matrix: Soil		Batch: 7081020			
% Solids	91.9	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	
15A-SD (A7H0536-30)			Matrix: Soil		Batch: 7081020			
% Solids	87.5	---	1.00	% by Weight	1	08/29/17 07:38	EPA 8000C	

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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:15

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080797 - EPA 3546						Soil						
Blank (7080797-BLK1)						Prepared: 08/18/17 10:10 Analyzed: 08/21/17 10:39						
EPA 8081B												
Dieldrin	ND	---	0.000909	mg/kg wet	1	---	---	---	---	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			Recovery: 89 %	Limits: 42-129 %		Dilution: 1x						
<i>Decachlorobiphenyl (Surr)</i>			101 %	65-151 %		"						
LCS (7080797-BS1)						Prepared: 08/18/17 10:10 Analyzed: 08/21/17 10:57						
EPA 8081B												
Dieldrin	0.0540	---	0.00100	mg/kg wet	1	0.0500	---	108	56-136%	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			Recovery: 86 %	Limits: 42-129 %		Dilution: 1x						
<i>Decachlorobiphenyl (Surr)</i>			93 %	65-151 %		"						
Duplicate (7080797-DUP1)						Prepared: 08/18/17 10:10 Analyzed: 08/21/17 12:27						
QC Source Sample: 33D-S-Comp (A7H0536-01)												
EPA 8081B												
Dieldrin	0.0167	---	0.00104	mg/kg dry	1	---	0.0197	---	---	17	30%	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			Recovery: 66 %	Limits: 42-129 %		Dilution: 1x						
<i>Decachlorobiphenyl (Surr)</i>			75 %	65-151 %		"						
Matrix Spike (7080797-MS1)						Prepared: 08/18/17 10:10 Analyzed: 08/21/17 14:12						
QC Source Sample: 15A-S-Comp (A7H0536-06)												
EPA 8081B												
Dieldrin	0.0734	---	0.00106	mg/kg dry	1	0.0530	0.0198	101	56-136%	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			Recovery: 75 %	Limits: 42-129 %		Dilution: 1x						
<i>Decachlorobiphenyl (Surr)</i>			88 %	65-151 %		"						
Batch 7081015 - EPA 3546						Soil						
Blank (7081015-BLK1)						Prepared: 08/28/17 12:41 Analyzed: 08/29/17 15:26						
EPA 8081B												
Dieldrin	ND	---	0.000833	mg/kg wet	1	---	---	---	---	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			Recovery: 90 %	Limits: 42-129 %		Dilution: 1x						
<i>Decachlorobiphenyl (Surr)</i>			112 %	65-151 %		"						
LCS (7081015-BS1)						Prepared: 08/28/17 12:41 Analyzed: 08/29/17 15:44						
EPA 8081B												
Dieldrin	0.0491	---	0.00100	mg/kg wet	1	0.0500	---	98	56-136%	---	---	

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:15

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7081015 - EPA 3546						Soil						
LCS (7081015-BS1)						Prepared: 08/28/17 12:41 Analyzed: 08/29/17 15:44						
EPA 8081B												
Surr: 2,4,5,6-TCMX (Surr) Recovery: 89 % Limits: 42-129 % Dilution: 1x												
Decachlorobiphenyl (Surr) 100 % 65-151 % "												
Duplicate (7081015-DUP1)						Prepared: 08/28/17 12:41 Analyzed: 08/29/17 16:19						
QC Source Sample: 33D-SA (A7H0536-11)												
EPA 8081B												
Dieldrin	0.00375	---	0.00104	mg/kg dry	1	---	0.00411	---	---	9	30%	
Surr: 2,4,5,6-TCMX (Surr) Recovery: 68 % Limits: 42-129 % Dilution: 1x												
Decachlorobiphenyl (Surr) 77 % 65-151 % "												
Matrix Spike (7081015-MS1)						Prepared: 08/28/17 12:41 Analyzed: 08/29/17 20:23						
QC Source Sample: 15A-SD (A7H0536-30)												
EPA 8081B												
Dieldrin	0.101	---	0.00102	mg/kg dry	1	0.0512	0.0576	85	56-136%	---	---	
Surr: 2,4,5,6-TCMX (Surr) Recovery: 76 % Limits: 42-129 % Dilution: 1x												
Decachlorobiphenyl (Surr) 93 % 65-151 % "												

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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:15

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080807 - Total Solids (Dry Weight)						Soil						
Batch 7081020 - Total Solids (Dry Weight)						Soil						
Duplicate (7081020-DUP1)						Prepared: 08/28/17 14:09 Analyzed: 08/29/17 07:38						
QC Source Sample: 33D-SA (A7H0536-11)												
EPA 8000C												
% Solids	87.2	---	1.00	% by Weight	1	---	87.2	---	---	0.007	10%	

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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:15

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080797							
A7H0536-01	Soil	EPA 8081B	08/17/17 11:16	08/18/17 10:10	10.79g/5mL	10g/5mL	0.93
A7H0536-02	Soil	EPA 8081B	08/17/17 11:00	08/18/17 10:10	10.32g/5mL	10g/5mL	0.97
A7H0536-03	Soil	EPA 8081B	08/17/17 12:00	08/18/17 10:10	10.28g/5mL	10g/5mL	0.97
A7H0536-04	Soil	EPA 8081B	08/17/17 12:16	08/18/17 10:10	10.76g/5mL	10g/5mL	0.93
A7H0536-05	Soil	EPA 8081B	08/17/17 13:18	08/18/17 10:10	10.66g/5mL	10g/5mL	0.94
A7H0536-06	Soil	EPA 8081B	08/17/17 13:34	08/18/17 10:10	10.43g/5mL	10g/5mL	0.96
Batch: 7081015							
A7H0536-11	Soil	EPA 8081B	08/17/17 11:08	08/28/17 12:41	11.34g/5mL	10g/5mL	0.88
A7H0536-12	Soil	EPA 8081B	08/17/17 11:10	08/28/17 12:41	11.68g/5mL	10g/5mL	0.86
A7H0536-13	Soil	EPA 8081B	08/17/17 11:12	08/28/17 12:41	11.27g/5mL	10g/5mL	0.89
A7H0536-14	Soil	EPA 8081B	08/17/17 11:14	08/28/17 12:41	11.53g/5mL	10g/5mL	0.87
A7H0536-23	Soil	EPA 8081B	08/17/17 13:10	08/28/17 12:41	11.36g/5mL	10g/5mL	0.88
A7H0536-24	Soil	EPA 8081B	08/17/17 13:12	08/28/17 12:41	11.17g/5mL	10g/5mL	0.90
A7H0536-25	Soil	EPA 8081B	08/17/17 13:14	08/28/17 12:41	10.87g/5mL	10g/5mL	0.92
A7H0536-26	Soil	EPA 8081B	08/17/17 13:16	08/28/17 12:41	10.84g/5mL	10g/5mL	0.92
A7H0536-27	Soil	EPA 8081B	08/17/17 13:26	08/28/17 12:41	10.9g/5mL	10g/5mL	0.92
A7H0536-28	Soil	EPA 8081B	08/17/17 13:28	08/28/17 12:41	11.35g/5mL	10g/5mL	0.88
A7H0536-29	Soil	EPA 8081B	08/17/17 13:30	08/28/17 12:41	11.02g/5mL	10g/5mL	0.91
A7H0536-30	Soil	EPA 8081B	08/17/17 13:32	08/28/17 12:41	11.12g/5mL	10g/5mL	0.90

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080807							
A7H0536-01	Soil	EPA 8000C	08/17/17 11:16	08/18/17 12:27	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-02	Soil	EPA 8000C	08/17/17 11:00	08/18/17 12:27	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-03	Soil	EPA 8000C	08/17/17 12:00	08/18/17 12:27	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-04	Soil	EPA 8000C	08/17/17 12:16	08/18/17 12:27	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-05	Soil	EPA 8000C	08/17/17 13:18	08/18/17 12:27	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-06	Soil	EPA 8000C	08/17/17 13:34	08/18/17 12:27	1N/A/1N/A	1N/A/1N/A	NA
Batch: 7081020							
A7H0536-11	Soil	EPA 8000C	08/17/17 11:08	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-12	Soil	EPA 8000C	08/17/17 11:10	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA

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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:15

SAMPLE PREPARATION INFORMATION

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A7H0536-13	Soil	EPA 8000C	08/17/17 11:12	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-14	Soil	EPA 8000C	08/17/17 11:14	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-23	Soil	EPA 8000C	08/17/17 13:10	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-24	Soil	EPA 8000C	08/17/17 13:12	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-25	Soil	EPA 8000C	08/17/17 13:14	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-26	Soil	EPA 8000C	08/17/17 13:16	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-27	Soil	EPA 8000C	08/17/17 13:26	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-28	Soil	EPA 8000C	08/17/17 13:28	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-29	Soil	EPA 8000C	08/17/17 13:30	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA
A7H0536-30	Soil	EPA 8000C	08/17/17 13:32	08/28/17 14:09	1N/A/1N/A	1N/A/1N/A	NA

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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:15

Notes and Definitions

Qualifiers:

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch
QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank
Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- *** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:15

Lab # **AAH0570** COC **L-03**

CHAIN OF CUSTODY

APEX LABS

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: **Anderson Geological** Project Mgr: **Erik Anderson** Project Name: **Northstar** Project #

Address: Phone: Fax: Email:

Sampled by: **E. Anderson**

Site Location: **(18) WA** Other:

SAMPLE ID	DATE	TIME	# OF CONTAINERS	ANALYSIS REQUEST	
				YES	NO
33D-S-COMP	11-16				
33D-N-COMP	11-00				
33C-N-COMP	12:00				
33C-S-COMP	12:16				
15A-N-COMP	13 18				
15A-S-COMP	13 34				
33D-NA	10 52				
33D-NB	10 54				
33D-NC	10 46				
33D-ND	10 38				

Matrix: **1200-Z**

ANALYSIS REQUEST:

RCRA Metals (B) **1200-COCS**

TCLP Metals (B)

600 TTO

8082 PCBs

8270 SIM PAHs

8270 SVOC

8260 RTEX VOCs

8260 HVOCS

8260 RBDV VOCs

8260 VOCs PHTLs

SWTPH-Ca

SWTPH-Ds

SWTPH-ClD

SPECIAL INSTRUCTIONS:

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY **5 DAY** Other:

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: **E. Anderson** Date: **8-14-17** Signature: *[Signature]*

RECEIVED BY: **Jan Obrien** Date: **8-14-17** Signature: *[Signature]*

Printed Name: **Erik Anderson** Time: **15:03** Printed Name: **Jan Obrien** Time: **15:03**

Company: **AGI** Company: **Apex**

Apex Laboratories

[Signature]

Darwin Thomas, Business Development Director

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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:15

CHAIN OF CUSTODY

Lab # **1740530**

Project Name: **Northstar**

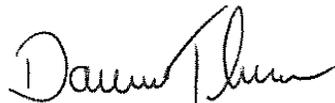
Project #

Project #

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological		Project Mgr: Erik Anderson		Project Name: Northstar		Project #	
Address:		Phone:		Fax:		Email:	
Sampled by: E. Anderson		Project Mgr: Erik Anderson		Project Name: Northstar		Project #	
Site Location: OR WA		Project Mgr: Erik Anderson		Project Name: Northstar		Project #	
Other:		Project Mgr: Erik Anderson		Project Name: Northstar		Project #	
SAMPLE ID		DATE		TIME		# OF CONTAINERS	
33D-SA	11-08	11:08					
33D-SB	11-10	11:10					
33D-SC	11-12	11:12					
33D-SD	11-14	11:14					
33C-NA	11-12	11:12					
33C-NB	11-14	11:14					
33C-NC	11-16	11:16					
33C-ND	11-18	11:18					
33C-SE	12-08	12:08					
33C-SB	(2)0	(2)0					
Normal Turn Around Time (TAT) = 10 Business Days		YES		NO			
TAT Requested (circle)		1 Day		2 Day		3 Day	
		4 DAY		5 DAY		Other:	
SPECIAL INSTRUCTIONS:		RECEIVED BY:		RECEIVED BY:			
		Signature: E. Anderson		Signature: [Signature]		Signature:	
		Date: 11-08-17		Date: 11-08-17		Date:	
		Printed Name: Erik Anderson		Printed Name: [Name]		Printed Name:	
		Time: 15:03		Time: 15:03		Time:	
Company: AGI		Company: AGI		Company:		Company:	

Apex Laboratories



Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:15

CHAIN OF CUSTODY

Lab # **A740536** POP# **3 of 3**

Company: **Anderson Geological** Project Mgr: **Erik Anderson** Project Name: **Northstar** Project #

Address: Phone: Fax: Email:

Sampled by: **E. Anderson** Site Location: **WA** Other: POP#

SAMPLE ID	LAB ID #	DATE	TIME	# OF CONTAINERS	ANALYSIS REQUEST	
					YES	NO
33C-3C		8/17	12:12	5		1200-Z
33C-3D			12:14			1200-COCS
15A-NA			13:10			TOTAL DISS TCFP
15A-NB			13:12			As, Ag, Na, TL, V, Zn
15A-NC			13:14			Hg, Mn, Ni, Pb, Se, Si, Tl, V, Zn
15A-ND			13:16			Cr, Cu, Fe, Ni, Pb, Se, Si, Tl, V, Zn
15A-FA			13:26			Mn, Ni, Pb, Se, Si, Tl, V, Zn
15A-SB			13:28			TCF Meth (B)
15A-SC			13:30			HCFA Meth (B)
15A-SD			13:32			609 TFO
						8082 PCBs
						8170 SIM PAHs
						8170 SVOC
						8160 BTEX VOCs
						8160 HVOCS
						8160 RBDV VOCs
						8160 VOCS Full List
						NWTH-CA
						NWTH-DB
						NWTH-DCID

Normal Turn-Around Time (TAT) = 10 Business Days SPECIAL INSTRUCTIONS:

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: RECEIVED BY: Date: Signature: Date: Printed Name: Time: Company:

SAMPLES ARE HELD FOR 30 DAYS RECEIVED BY: Date: Signature: Date: Printed Name: Time: Company:

RELINQUISHED BY: Date: Signature: Date: Printed Name: Time: Company:

RELINQUISHED BY: Date: Signature: Date: Printed Name: Time: Company:

Apex Laboratories



Darwin Thomas, Business Development Director

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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:15

APEX LABS COOLER RECEIPT FORM

Client: Anderson Element WO#: A7 H05360

Project/Project #: Northstar

Delivery info:

Date/Time Received: 8/17/17 @ 1503 By: AKK

Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Inspected by: AKK : 8/17/17 @ 1505

Chain of Custody Included? Yes No Custody Seals? Yes No

Signed/Dated by Client? Yes No

Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>3.9</u>						
Received on Ice? (Y/N)							
Temp. Blanks? (Y/N)							
Ice Type: (Gel/Real/Other)							
Condition:							

Cooler out of temp? (Y/N) Possible reason why: _____

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No

Samples Inspection: Inspected by: AKK : 8/17/17 @ 1555

All Samples Intact? Yes No Comments: _____

Bottle Labels/COCs agree? Yes No Comments: 33C-NC ID reads 33-NC, correlated by ID on lid. No T on Cont. 33D-S-comp -> 33C-SB

Containers/Volumes Received Appropriate for Analysis? Yes No Comments: _____

Do VOA Vials have Visible Headspace? Yes No NA

Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes No NA

Comments: _____

Additional Information: NO Don COC, Don Cont. reads 8/17/17.

Labeled by: AKK Witness: KAZ Cooler Inspected by: KAL See Project Contact Form: Y



Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Sunday, September 3, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

RE: Northstar / [none]

Enclosed are the results of analyses for work order A7H0563, which was received by the laboratory on 8/18/2017 at 1:43:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:29

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
9D-N-COMP (2)	A7H0563-01	Soil	08/18/17 09:56	08/18/17 13:43
9D-S-COMP (2)	A7H0563-02	Soil	08/18/17 10:16	08/18/17 13:43
9A-N-COMP (2)	A7H0563-03	Soil	08/18/17 11:04	08/18/17 13:43
9A-S-COMP (2)	A7H0563-04	Soil	08/18/17 11:20	08/18/17 13:43
9B-N-COMP (2)	A7H0563-05	Soil	08/18/17 12:14	08/18/17 13:43
9B-S-COMP (2)	A7H0563-06	Soil	08/18/17 12:44	08/18/17 13:43

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:29

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
9D-N-COMP (2) (A7H0563-01RE1)			Matrix: Soil		Batch: 7080797			
Dieldrin	0.167	---	0.00644	mg/kg dry	5	08/21/17 13:00	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 73 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>90 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
9D-S-COMP (2) (A7H0563-02)			Matrix: Soil		Batch: 7080797			
Dieldrin	0.00221	---	0.00113	mg/kg dry	1	08/21/17 11:32	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 74 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>94 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
9A-N-COMP (2) (A7H0563-03)			Matrix: Soil		Batch: 7080797			
Dieldrin	ND	---	0.00123	mg/kg dry	1	08/21/17 11:49	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 76 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>91 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
9A-S-COMP (2) (A7H0563-04)			Matrix: Soil		Batch: 7080797			
Dieldrin	0.0815	---	0.00113	mg/kg dry	1	08/21/17 12:07	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 82 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>100 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
9B-N-COMP (2) (A7H0563-05)			Matrix: Soil		Batch: 7080797			
Dieldrin	0.00248	---	0.00155	mg/kg dry	1	08/21/17 12:24	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 80 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>99 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
9B-S-COMP (2) (A7H0563-06)			Matrix: Soil		Batch: 7080797			
Dieldrin	ND	---	0.00103	mg/kg dry	1	08/21/17 12:42	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 79 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>95 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:29

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
9D-N-COMP (2) (A7H0563-01)			Matrix: Soil		Batch: 7080807			
% Solids	74.8	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	
9D-S-COMP (2) (A7H0563-02)			Matrix: Soil		Batch: 7080807			
% Solids	84.8	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	
9A-N-COMP (2) (A7H0563-03)			Matrix: Soil		Batch: 7080807			
% Solids	78.2	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	
9A-S-COMP (2) (A7H0563-04)			Matrix: Soil		Batch: 7080819			
% Solids	84.9	---	1.00	% by Weight	1	08/21/17 09:53	EPA 8000C	
9B-N-COMP (2) (A7H0563-05)			Matrix: Soil		Batch: 7080807			
% Solids	61.8	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	
9B-S-COMP (2) (A7H0563-06)			Matrix: Soil		Batch: 7080807			
% Solids	94.9	---	1.00	% by Weight	1	08/21/17 08:43	EPA 8000C	

Apex Laboratories



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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:29

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080797 - EPA 3546						Soil						
Blank (7080797-BLK1)						Prepared: 08/18/17 10:10 Analyzed: 08/21/17 10:39						
EPA 8081B												
Dieldrin	ND	---	0.000909	mg/kg wet	1	---	---	---	---	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 89 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>101 %</i>		<i>65-151 %</i>		<i>"</i>					
LCS (7080797-BS1)						Prepared: 08/18/17 10:10 Analyzed: 08/21/17 10:57						
EPA 8081B												
Dieldrin	0.0540	---	0.00100	mg/kg wet	1	0.0500	---	108	56-136%	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 86 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>93 %</i>		<i>65-151 %</i>		<i>"</i>					

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: [none] Project Manager: Erik Anderson	Reported: 09/03/17 14:29
---	---	------------------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080807 - Total Solids (Dry Weight)						Soil						
Batch 7080819 - Total Solids (Dry Weight)						Soil						
Duplicate (7080819-DUP1)			Prepared: 08/21/17 08:54 Analyzed: 08/21/17 09:53									
QC Source Sample: 9A-S-COMP (2) (A7H0563-04)												
EPA 8000C												
% Solids	85.1	---	1.00	% by Weight	1	---	84.9	---	---	0.3	10%	

Apex Laboratories



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Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: [none] Project Manager: Erik Anderson	Reported: 09/03/17 14:29
---	---	------------------------------------

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080797							
A7H0563-01RE1	Soil	EPA 8081B	08/18/17 09:56	08/18/17 16:13	10.38g/5mL	10g/5mL	0.96
A7H0563-02	Soil	EPA 8081B	08/18/17 10:16	08/18/17 16:13	10.47g/5mL	10g/5mL	0.96
A7H0563-03	Soil	EPA 8081B	08/18/17 11:04	08/18/17 16:13	10.35g/5mL	10g/5mL	0.97
A7H0563-04	Soil	EPA 8081B	08/18/17 11:20	08/18/17 16:13	10.39g/5mL	10g/5mL	0.96
A7H0563-05	Soil	EPA 8081B	08/18/17 12:14	08/18/17 16:13	10.45g/5mL	10g/5mL	0.96
A7H0563-06	Soil	EPA 8081B	08/18/17 12:44	08/18/17 16:13	10.23g/5mL	10g/5mL	0.98

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080807							
A7H0563-01	Soil	EPA 8000C	08/18/17 09:56	08/18/17 16:36	1N/A/1N/A	1N/A/1N/A	NA
A7H0563-02	Soil	EPA 8000C	08/18/17 10:16	08/18/17 16:36	1N/A/1N/A	1N/A/1N/A	NA
A7H0563-03	Soil	EPA 8000C	08/18/17 11:04	08/18/17 16:36	1N/A/1N/A	1N/A/1N/A	NA
A7H0563-05	Soil	EPA 8000C	08/18/17 12:14	08/18/17 16:36	1N/A/1N/A	1N/A/1N/A	NA
A7H0563-06	Soil	EPA 8000C	08/18/17 12:44	08/18/17 16:36	1N/A/1N/A	1N/A/1N/A	NA
Batch: 7080819							
A7H0563-04	Soil	EPA 8000C	08/18/17 11:20	08/21/17 08:54	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:29

Notes and Definitions

Qualifiers:

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch
QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank
Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- *** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:29

APEX LABS

CHAIN OF CUSTODY

Lab # AT145103 Coc. 1 of 3

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological Project Mgr: Northstar Project # _____

Address: _____ Phone: _____ Email: _____

Sampled by: E. Anderson

Site Location: OR WA

Other: _____

LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTRH-CID	NWTRH-D	NWTRH-G	8160 VOCs Full Lab	8160 RHDV VOCs	8160 HVOCS	8260 BTEX VOCs	8270 SVOC	8270 SIM PAHS	8082 PCBs	609 TIO	RCRA Metals (B)	TCLF Metals (B)	AL, SR, AS, Ba, Be, Br, CR, HI, Hg, Mn, Ni, Cu, Pb, Se, Tl, V, Zn	TOTAL DISS TCLF	1200-COLS	1200-Z	Other			
9D-N-Comp (2)	08/17/17	09:56	S	1																					
9D-S-Comp (2)		10:16																							
9A-N-Comp (2)		11:04																							
9A-S-Comp (2)		11:20																							
9B-N-Comp (2)		12:14																							
9B-S-Comp (2)		12:44																							
9D-N4 (2)		09:40																							
9D-NB (2)		09:50																							
9D-NC (2)		09:52																							
9D-ND (2)		09:54																							

Normal Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: _____

SPECIAL INSTRUCTIONS: _____

RELINQUISHED BY: E.A. Date: 08/17/17 Signature: [Signature] Title: [Title]

RECEIVED BY: [Signature] Date: 08/18/17 Signature: [Signature] Title: [Title]

Company: Apex

Apex Laboratories

Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:29

CHAIN OF CUSTODY

Lab # _____ PO# _____
COC 2 of 3

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological Project Mgr: _____
Address: _____ Project Name: Northstar
Phone: _____ Fax: _____ Email: _____

SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	ANALYSIS REQUEST		
						SWTPH-63	SWTPH-64	SWTPH-65
9D-SA(2)		9/18/17	10:00	S	1	TC P Metals (3)	RC RA Metals (3)	600 TTO
9D-SB(2)		10/10				TC P Metals (3)	RC RA Metals (3)	600 TTO
9D-SC(2)		10/12				TC P Metals (3)	RC RA Metals (3)	600 TTO
9D-SD(2)		10/14				TC P Metals (3)	RC RA Metals (3)	600 TTO
9A-WA(2)		10/26				TC P Metals (3)	RC RA Metals (3)	600 TTO
9A-WB(2)		10/26				TC P Metals (3)	RC RA Metals (3)	600 TTO
9A-WC(2)		11/00				TC P Metals (3)	RC RA Metals (3)	600 TTO
9A-ND(2)		11/02				TC P Metals (3)	RC RA Metals (3)	600 TTO
9A-SA(2)		11/12				TC P Metals (3)	RC RA Metals (3)	600 TTO
9A-SB(2)		11/14				TC P Metals (3)	RC RA Metals (3)	600 TTO

Normal Turn Around Times (TAT) = 10 Business Days

TAT Requested (circle)	1 Day	2 Day	3 Day	4 DAY	5 DAY	Other:

RECEIVED BY: _____
Signature: Erik Anderson Date: 9/18/17
Printed Name: Erik Anderson Time: 13:43

RECEIVED BY: _____
Signature: _____ Date: _____
Printed Name: _____ Time: _____

Company: AG-1 Company: Apex

Apex Laboratories



Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: [none]
Project Manager: Erik Anderson

Reported:
09/03/17 14:29

CHAIN OF CUSTODY

COC 3 of 3

Lab # A7H05163

POF

Project Name: Northstar

Project #

Company: Anderson Geological

Address:

Phone:

Project Mgr:

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

SAMPLE ID	LAB ID #	DATE	TIME	MATERIALS	# OF CONTAINERS	ANALYSIS REQUEST	
						YES	NO
9A-5C (2)		11/16		S	1		
9A-5D (2)		11/16					
9B-NA (2)		12-06					
9B-NB (2)		12-08					
9B-NC (2)		12-10					
9B-ND (2)		12-12					
9B-SA (2)		12-26					
9B-SB (2)		12-27					
9B-SC (2)		12-30					
9B-SD (2)		12-31					

Normal Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY OTHER: _____

SPECIAL INSTRUCTIONS:

RECEIVED BY: Erik Anderson Date: 12/17/17 Signature: [Signature] Title: Project Manager

RECEIVED BY: [Signature] Date: 12/18/17 Signature: [Signature] Title: [Title]

Company: AGC

Apex Laboratories

Darwin Thomas

Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: [none]
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:29

APEX LABS COOLER RECEIPT FORM

Client: Anderson Geological Element WO#: A7_H0563
 Project/Project #: Northstar

Delivery info:

Date/Time Received: 8/18/17 @ 1343 By: JS
 Delivered by: Apex ___ Client ESS ___ FedEx ___ UPS ___ Swift ___ Senvoy ___ SDS ___ Other ___

Cooler Inspection Inspected by: JS : 8/18/17 @ 1345
 Chain of Custody Included? Yes No ___ Custody Seals? Yes ___ No
 Signed/Dated by Client? Yes No ___
 Signed/Dated by Apex? Yes No ___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>1.5</u>						
Received on Ice? (Y/N)	<u>(Y)</u>						
Temp. Blanks? (Y/N)	<u>(Y)</u>						
Ice Type: (Gel/Real/Other)	<u>(Gel)</u>						
Condition:	<u>good</u>						

Cooler out of temp? (Y/N) (N) Possible reason why: _____
 If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA (NA)

Samples Inspection: Inspected by: (JS) : 8/18/17 @ 1525
 All Samples Intact? Yes No ___ Comments: _____

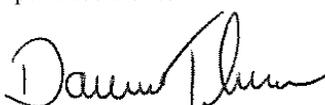
Bottle Labels/COCs agree? Yes No ___ Comments: NO T ON CONTAINERS, 9D-N-Comp (2) NO D ON CONTAINER, 9A-S-Comp (2) NO D ON CONTAINER
 Containers/Volumes Received Appropriate for Analysis? Yes No ___ Comments: _____

Do VOA Vials have Visible Headspace? Yes ___ No ___ NA
 Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes ___ No ___ NA
 Comments: _____

Additional Information:

Labeled by: (B) Witness: JS Cooler Inspected by: (JS) See Project Contact Form: Y

Apex Laboratories

 Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Sunday, September 3, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

RE: Northstar / 1503.00

Enclosed are the results of analyses for work order A7H0579, which was received by the laboratory on 8/21/2017 at 7:49:00AM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.00
Project Manager: Erik Anderson

Reported:
09/03/17 14:35

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
13B-N-Comp(2)	A7H0579-01	Soil	08/19/17 11:06	08/21/17 07:49
14A-N-Comp(2)	A7H0579-03	Soil	08/19/17 12:18	08/21/17 07:49

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.00
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:35

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
13B-N-Comp(2) (A7H0579-01)			Matrix: Soil		Batch: 7080863			
Dieldrin	0.0190	---	0.00111	mg/kg dry	1	08/24/17 17:11	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>		<i>Recovery: 76 %</i>		<i>Limits: 42-129 %</i>		"	"	"
<i>Decachlorobiphenyl (Surr)</i>		<i>91 %</i>		<i>Limits: 65-151 %</i>		"	"	"
14A-N-Comp(2) (A7H0579-03)			Matrix: Soil		Batch: 7080863			
Dieldrin	0.0228	---	0.000981	mg/kg dry	1	08/24/17 17:47	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>		<i>Recovery: 76 %</i>		<i>Limits: 42-129 %</i>		"	"	"
<i>Decachlorobiphenyl (Surr)</i>		<i>85 %</i>		<i>Limits: 65-151 %</i>		"	"	"

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.00
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:35

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
13B-N-Comp(2) (A7H0579-01)			Matrix: Soil		Batch: 7080860			
% Solids	87.7	---	1.00	% by Weight	1	08/23/17 07:30	EPA 8000C	
14A-N-Comp(2) (A7H0579-03)			Matrix: Soil		Batch: 7080860			
% Solids	88.7	---	1.00	% by Weight	1	08/23/17 07:30	EPA 8000C	

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.00
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:35

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080863 - EPA 3546						Soil						
Blank (7080863-BLK1)						Prepared: 08/22/17 16:23 Analyzed: 08/24/17 16:37						
EPA 8081B												
Dieldrin	ND	---	0.000833	mg/kg wet	1	---	---	---	---	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 90 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>109 %</i>	<i>65-151 %</i>		<i>"</i>						
LCS (7080863-BS1)						Prepared: 08/22/17 16:23 Analyzed: 08/24/17 16:54						
EPA 8081B												
Dieldrin	0.0501	---	0.00100	mg/kg wet	1	0.0500	---	100	56-136%	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 91 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>107 %</i>	<i>65-151 %</i>		<i>"</i>						
Duplicate (7080863-DUP1)						Prepared: 08/22/17 16:23 Analyzed: 08/24/17 17:29						
QC Source Sample: 13B-N-Comp(2) (A7H0579-01)												
EPA 8081B												
Dieldrin	0.0168	---	0.00110	mg/kg dry	1	---	0.0190	---	---	13	30%	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 74 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>86 %</i>	<i>65-151 %</i>		<i>"</i>						
Matrix Spike (7080863-MS1)						Prepared: 08/22/17 16:23 Analyzed: 08/24/17 18:04						
QC Source Sample: 14A-N-Comp(2) (A7H0579-03)												
EPA 8081B												
Dieldrin	0.0709	---	0.000977	mg/kg dry	1	0.0489	0.0228	98	56-136%	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 85 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>99 %</i>	<i>65-151 %</i>		<i>"</i>						

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.00
Project Manager: Erik Anderson

Reported:
09/03/17 14:35

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080860 - Total Solids (Dry Weight)							Soil					

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.00 Project Manager: Erik Anderson	Reported: 09/03/17 14:35
---	--	------------------------------------

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080863							
A7H0579-01	Soil	EPA 8081B	08/19/17 11:06	08/22/17 16:23	10.31g/5mL	10g/5mL	0.97
A7H0579-03	Soil	EPA 8081B	08/19/17 12:18	08/22/17 16:23	11.5g/5mL	10g/5mL	0.87

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080860							
A7H0579-01	Soil	EPA 8000C	08/19/17 11:06	08/22/17 14:37	1N/A/1N/A	1N/A/1N/A	NA
A7H0579-03	Soil	EPA 8000C	08/19/17 12:18	08/22/17 14:37	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.00
Project Manager: Erik Anderson

Reported:
09/03/17 14:35

Notes and Definitions

Qualifiers:

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to ½ the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- *** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.00
Project Manager: Erik Anderson

Reported:
09/03/17 14:35

APEX LABS
CHAIN OF CUSTODY
 Lab # **AH10579**
 PO#

COC 1 of 2

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological Project Mgr: Erik Anderson Project Name: Northstar Project #

Address: Anderson Geological Phone: 503-718-2323 Fax: 503-718-0333 Email:

Sampled by: E. Anderson

Site Location: OR WA Other: _____

SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	SPECIAL INSTRUCTIONS:	
						YES	NO
13B-N-COMP (2)		8/16/17	11:06	S	1		
13B-S-COMP (2)		11:30					
14A-N-COMP (2)		12:18					
14A-S-COMP (2)		12:38					
13B-N/A (2)		10:58					
13B-N/B (2)		11:00					
13B-N/C (2)		11:02					
13B-ND (2)		11:04					
13B-SA (2)		11:02					
13B-SB (2)		11:24					

ANALYSIS REQUEST

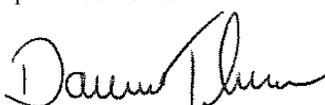
ANALYSIS REQUEST	
NWTR-HCID	
NWTR-GA	
NWTR-VA	
8260 VOCs-P&L	
8260 RRDV VOCs	
8260 HVOC	
8260 HTEX VOCs	
8270 SVOC	
8270 SIM PAHs	
8082 PCBs	
690 TFO	
RCRA Metals (B)	
TCF Metals (B)	
AL, SR, AS, BA, BR, CR	
CU, CY, CA, CB, CE, FE, NI	
ZN, AG, MS, TL, V, ZR	
TOTAL HHS TEFP	
1200-COLS	
1200-Z	

RELINQUISHED BY: E. Anderson Date: 9/2/17 Signature: D. Thibodeau Date: 9/2/17
 Printed Name: Erik Anderson Time: 07:49 Printed Name: _____ Time: _____
 Company: AGI Company: _____

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: _____

SAMPLES ARE HELD FOR 30 DAYS

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.00
Project Manager: Erik Anderson

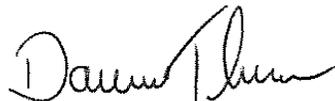
Reported:
09/03/17 14:35

APEX LABS **CHAIN OF CUSTODY** Lab # A140579 CDC 2 of 2

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: <u>Anderson Geological</u>		Project Mgr: <u>Erik Anderson</u>		Project Name: <u>Northstar</u>		Project #	
Address:		Phone:		Fac:		Email:	
Sampled by: <u>E. Anderson</u>		Project Mgr: <u>Erik Anderson</u>		Project Name: <u>Northstar</u>		Project #	
Site Location: <u>OR</u> WA		Matrix: _____		TCTP Metals (B)		TCTP Metals (B)	
Other: _____		# OF CONTAINERS		RCRA Metals (B)		RCRA Metals (B)	
SAMPLE ID		DATE		TIME		LAB ID #	
1 <u>13B-5C (2)</u>		<u>8/14/17</u>		<u>11:26</u>		<u>5</u>	
2 <u>13B-5D (2)</u>				<u>11:28</u>			
3 <u>14A-NA (2)</u>				<u>12:10</u>			
4 <u>14A-NB (2)</u>				<u>12:12</u>			
5 <u>14A-NC (2)</u>				<u>12:14</u>			
6 <u>14A-ND (2)</u>				<u>12:16</u>			
7 <u>14A-SE (2)</u>				<u>12:30</u>			
8 <u>14A-SB (2)</u>				<u>12:32</u>			
9 <u>14A-SC (2)</u>				<u>12:34</u>			
10 <u>14A-SD (2)</u>				<u>12:36</u>			
Normal Turn Around Time (TAT) = 10 Business Days		YES		NO		SPECIAL INSTRUCTIONS:	
TAT Requested (circle)		1 Day		2 Day		3 Day	
		4 DAY		5 DAY		Other: _____	
SAMPLES ARE HELD FOR 30 DAYS		RECEIVED BY:		RECEIVED BY:		RECEIVED BY:	
Signature: <u>Erick</u>		Date: <u>8/21/17</u>		Signature: <u>D. Thomas</u>		Date: <u>8/21/17</u>	
Printed Name: <u>Erik Anderson</u>		Time: <u>07:49</u>		Printed Name: _____		Time: _____	
Company: <u>AGI</u>		Company: <u>Apex</u>		Company: _____		Company: _____	

Apex Laboratories



Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.00
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:35

APEX LABS COOLER RECEIPT FORM

Client: Anderson Geo Element WO#: A7 110579

Project/Project #: Northstar

Delivery info:

Date/Time Received: 8/21/17 @ 0749 By: D. Hearn

Delivered by: Apex ___ Client ESS FedEx ___ UPS ___ Swift ___ Senvoy ___ SDS ___ Other ___

Cooler Inspection Inspected by: DT : 8/21/17 @ 0750

Chain of Custody Included? Yes No ___ Custody Seals? Yes ___ No

Signed/Dated by Client? Yes No ___

Signed/Dated by Apex? Yes No ___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>3.5°C</u>						
Received on Ice? (Y/N)	<u>Y</u>						
Temp. Blanks? (Y/N)	<u>N</u>						
Ice Type: (Gel/Real/Other)	<u>Gel</u>						
Condition:	<u>Good</u>						

Cooler out of temp? (Y/N) Possible reason why: _____

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: KM : 8/21/17 @ 1040

All Samples Intact? Yes No ___ Comments: _____

Bottle Labels/COCs agree? Yes No ___ Comments: NO T on COCS

Containers/Volumes Received Appropriate for Analysis? Yes No ___ Comments: _____

Do VOA Vials have Visible Headspace? Yes ___ No ___ NA

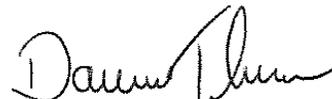
Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes ___ No ___ NA

Comments: _____

Additional Information: _____

Labeled by: KM Witness: OH Cooler Inspected by: DT See Project Contact Form: Y



Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Sunday, September 3, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

RE: Northstar / 25513.000

Enclosed are the results of analyses for work order A7H0689, which was received by the laboratory on 8/24/2017 at 5:40:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 25513.000
Project Manager: Erik Anderson

Reported:
09/03/17 14:42

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
9A-S-Comp (3)	A7H0689-01	Soil	08/24/17 16:28	08/24/17 17:40
9D-N-Comp (3)	A7H0689-02	Soil	08/24/17 16:18	08/24/17 17:40
10C-NC (2)	A7H0689-03	Soil	08/24/17 14:43	08/24/17 17:40
10C-ND (2)	A7H0689-04	Soil	08/24/17 14:34	08/24/17 17:40

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 25513.000
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:42

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
9A-S-Comp (3) (A7H0689-01)			Matrix: Soil		Batch: 7080947			
Dieldrin	ND	---	0.00122	mg/kg dry	1	08/25/17 11:34	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 77 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>70 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
9D-N-Comp (3) (A7H0689-02)			Matrix: Soil		Batch: 7080947			
Dieldrin	ND	---	0.00112	mg/kg dry	1	08/25/17 11:51	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 84 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>86 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
10C-NC (2) (A7H0689-03)			Matrix: Soil		Batch: 7080947			
Dieldrin	ND	---	0.00110	mg/kg dry	1	08/25/17 12:09	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 79 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>80 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
10C-ND (2) (A7H0689-04)			Matrix: Soil		Batch: 7080947			
Dieldrin	ND	---	0.00115	mg/kg dry	1	08/25/17 12:26	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 79 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>81 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 25513.000
 Project Manager: Erik Anderson

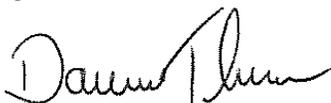
Reported:
 09/03/17 14:42

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
9A-S-Comp (3) (A7H0689-01)			Matrix: Soil		Batch: 7080981			
% Solids	80.1	---	1.00	% by Weight	1	08/28/17 07:46	EPA 8000C	
9D-N-Comp (3) (A7H0689-02)			Matrix: Soil		Batch: 7080981			
% Solids	84.8	---	1.00	% by Weight	1	08/28/17 07:46	EPA 8000C	
10C-NC (2) (A7H0689-03)			Matrix: Soil		Batch: 7080939			
% Solids	83.3	---	1.00	% by Weight	1	08/25/17 07:30	EPA 8000C	
10C-ND (2) (A7H0689-04)			Matrix: Soil		Batch: 7080939			
% Solids	83.7	---	1.00	% by Weight	1	08/25/17 07:30	EPA 8000C	

Apex Laboratories



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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 25513.000
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:42

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080947 - EPA 3546						Soil						
Blank (7080947-BLK1)						Prepared: 08/24/17 16:11 Analyzed: 08/25/17 10:59						
EPA 8081B												
Dieldrin	ND	---	0.000909	mg/kg wet	1	---	---	---	---	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 93 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>92 %</i>		<i>65-151 %</i>		<i>"</i>					
LCS (7080947-BS1)						Prepared: 08/24/17 16:11 Analyzed: 08/25/17 11:17						
EPA 8081B												
Dieldrin	0.0382	---	0.00100	mg/kg wet	1	0.0500	---	76	56-136%	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 92 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>90 %</i>		<i>65-151 %</i>		<i>"</i>					

Apex Laboratories



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Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 25513.000 Project Manager: Erik Anderson	Reported: 09/03/17 14:42
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QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7080939 - Total Solids (Dry Weight)							Soil					
Batch 7080981 - Total Solids (Dry Weight)							Soil					

Apex Laboratories



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Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 25513.000 Project Manager: Erik Anderson	Reported: 09/03/17 14:42
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SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080947							
A7H0689-01	Soil	EPA 8081B	08/24/17 16:28	08/24/17 18:13	10.22g/5mL	10g/5mL	0.98
A7H0689-02	Soil	EPA 8081B	08/24/17 16:18	08/24/17 18:13	10.48g/5mL	10g/5mL	0.95
A7H0689-03	Soil	EPA 8081B	08/24/17 14:43	08/24/17 18:13	10.88g/5mL	10g/5mL	0.92
A7H0689-04	Soil	EPA 8081B	08/24/17 14:34	08/24/17 18:13	10.42g/5mL	10g/5mL	0.96

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7080939							
A7H0689-03	Soil	EPA 8000C	08/24/17 14:43	08/24/17 18:17	1N/A/1N/A	1N/A/1N/A	NA
A7H0689-04	Soil	EPA 8000C	08/24/17 14:34	08/24/17 18:17	1N/A/1N/A	1N/A/1N/A	NA
Batch: 7080981							
A7H0689-01	Soil	EPA 8000C	08/24/17 16:28	08/25/17 13:08	1N/A/1N/A	1N/A/1N/A	NA
A7H0689-02	Soil	EPA 8000C	08/24/17 16:18	08/25/17 13:08	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 25513.000
Project Manager: Erik Anderson

Reported:
09/03/17 14:42

Notes and Definitions

Qualifiers:

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- *** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 25513.000
Project Manager: Erik Anderson

Reported:
09/03/17 14:42

CHAIN OF CUSTODY

Company: **PBS** Project Mgr: **Mike Galden** Project Name: **Northstar** Project # **25513.000**

Address: **4412 SW Coburn Ave, Portland, OR** Phone: **503-702-7510** Fax: Email: Lab # **A7H0689** COC 1 of 2

Sampled by: **Mike Galden**

Site Location: **OR** W/A Other: ANALYSIS REQUEST: **9A8081 - Dieldr.**

LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	SWTPH-CTD	SWTPH-DS	SWTPH-GS	8260 VOCs-PH/LM	8260 RBDN VOCs	8260 HVOCS	8260 BTEX VOCs	8270 SVOC	8270 SMT PAHS	8082 PCBs	600 TIO	HCFA Metals (B)	TCLP Metals (B)	AL, SR, AS, BA, BE, CA, CB, CC, CD, CE, CF, CG, CH, CI, CL, CM, CN, CO, CP, CR, CS, CT, CU, CV, CW, CX, CY, CZ	TOTAL DIS. TCLP	1200-COLS	1200-Z	
9A-S-COMP (3) **	8/17/17 1405	S	S	1																	X 2 DAY TAT	
9D-N-COMP (5) **	8/17/17 1415	S	S	1																		X 2 DAY TAT
10C-NC (2) *	8/17/17 1418	S	S	1																		X 2 DAY TAT
10C-ND (2) *	8/17/17 1434	S	S	1																		X 2 DAY TAT
9A-SB (3)	8/17/17 1405	S	S	1																		HOLD
9A-SA (3)	8/17/17 1555	S	S	1																		
9A-SC (3)	8/17/17 1557	S	S	1																		
9A-SD (3)	8/17/17 1545	S	S	1																		
9D-NB (3)	8/17/17 1517	S	S	1																		
9D-NA (3)	8/17/17 1521	S	S	1																		

SPECIAL INSTRUCTIONS: **NO**

TAT Requested (grc/cr): * **1 Day** (circled) **2 Day** (circled) **3 Day** (circled) 4 DAY 5 DAY Other: _____

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: **Mike Galden** RECEIVED BY: **Eric** Signature: **Mike Galden** Date: **8/17/17** Signature: **Eric** Date: **8/17/17**

Printed Name: **Mike Galden** Printed Name: **Eric** Company: **PBS** Company: **Apex**

Apex Laboratories

Darwin Thomas

Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 25513.000
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:42

CHAIN OF CUSTODY

APEX LABS 12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333
 Company: **PBS** Project Mgr: **Mike Golden** Project Name: **Northstar** Project #: **25513.000**
 Address: **4412 SW Corbett Avenue, Portland OR** Phone: **503-703-9950** Email: **mike.golden@pbslabs.com**
 Sampled by: **Mike Golden** Lab #: **A1H0689** POB: **2 of 2**

LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	ANALYSIS REQUEST
90-NC (3)	8/17/17	1509	S	1	1200-Z 1200-COLS TOTAL DMS TCLP Pb, As, Ni, Tl, V, Zn Cr, Cd, Cu, Fe, Mn, Rb, Sr Cl, Se, As, Ba, Be, C, Ca, Co, Cr, Ni, Pb, P, R, Si, Tl, V, Zn TCLP Metals (B) RCRA Metals (B) 600 TTO 8081 PCBs 8170 SIM PAHS 8170 SVOC 8160 BTEX VOCs 8160 IVOCS 8160 RBDV VOCs 8160 VOCs Full List SWTTH-CX SWTTH-DX SWTTH-HCID
90-ND (3)	8/17/17	1453	S	1	HOLD HOLD EPA 8081 - Data

Normal Turn Around Time (TAT) is 10 Business Days YES NO
 TAT Requested (circle): **1 Day** **2 Day** 3 Day 4 DAY 5 DAY Other: _____

RECEIVED BY: [Signature] Date: 8/21/17
 RECEIVED BY: [Signature] Date: 8/21/17

SIGNED BY: [Signature] Date: 8/21/17
 SIGNED BY: [Signature] Date: 8/21/17

RECEIVED BY: [Signature] Date: 8/21/17
 RECEIVED BY: [Signature] Date: 8/21/17

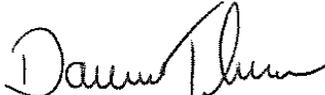
SIGNED BY: [Signature] Date: 8/21/17
 SIGNED BY: [Signature] Date: 8/21/17

SPECIAL INSTRUCTIONS:

RECEIVED BY: [Signature] Date: 8/21/17
 RECEIVED BY: [Signature] Date: 8/21/17

SIGNED BY: [Signature] Date: 8/21/17
 SIGNED BY: [Signature] Date: 8/21/17

Apex Laboratories



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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 25513.000
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:42

APEX LABS COOLER RECEIPT FORM

Client: Anderson Geo. Element WO#: A7 H0689

Project/Project #: Northstar / 25513.000

Delivery info:

Date/Time Received: 8/24/17 @ 1740 By: OB

Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Inspected by: OB : 8/24/17 @ 1740

Chain of Custody Included? Yes No Custody Seals? Yes No

Signed/Dated by Client? Yes No

Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>1.9</u>						
Received on Ice? (Y/N)	<u>Y</u>						
Temp. Blanks? (Y/N)	<u>Y</u>						
Ice Type: (Gel/Real/Other)	<u>Y</u>						
Condition:							

Cooler out of temp? (Y/N) Possible reason why: _____

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: OB : 8/24/17 @ 1740

All Samples Intact? Yes No Comments: _____

Bottle Labels/COCs agree? Yes No Comments: _____

Containers/Volumes Received Appropriate for Analysis? Yes No Comments: _____

Do VOA Vials have Visible Headspace? Yes No NA

Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes No NA

Comments: _____

Additional Information: _____

Labeled by: OB Witness: _____ Cooler Inspected by: OB See Project Contact Form: Y

KRL

Darwin Thomas

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Sunday, September 3, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

RE: Northstar / 1503.000

Enclosed are the results of analyses for work order A7H0874, which was received by the laboratory on 8/30/2017 at 5:05:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.000
Project Manager: Erik Anderson

Reported:
09/03/17 14:50

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
8A-N-COMP(2)	A7H0874-01	Soil	08/30/17 15:26	08/30/17 17:05
8A-S-COMP(2)	A7H0874-02	Soil	08/30/17 15:39	08/30/17 17:05
33A-N-COMP(2)	A7H0874-03	Soil	08/30/17 13:20	08/30/17 17:05
33B-N-COMP(2)	A7H0874-04	Soil	08/30/17 13:10	08/30/17 17:05
33B-S-COMP(2)	A7H0874-05	Soil	08/30/17 13:30	08/30/17 17:05

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.000
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:50

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
8A-N-COMP(2) (A7H0874-01)			Matrix: Soil		Batch: 7081118			
Dieldrin	ND	---	0.00106	mg/kg dry	1	08/31/17 12:06	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 75 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>94 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
8A-S-COMP(2) (A7H0874-02)			Matrix: Soil		Batch: 7081118			
Dieldrin	ND	---	0.00107	mg/kg dry	1	08/31/17 12:41	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 81 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>108 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
33A-N-COMP(2) (A7H0874-03)			Matrix: Soil		Batch: 7081118			
Dieldrin	ND	---	0.00110	mg/kg dry	1	08/31/17 12:59	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 74 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>96 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
33B-N-COMP(2) (A7H0874-04)			Matrix: Soil		Batch: 7081118			
Dieldrin	ND	---	0.00107	mg/kg dry	1	08/31/17 13:16	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 70 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>91 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
33B-S-COMP(2) (A7H0874-05)			Matrix: Soil		Batch: 7081118			
Dieldrin	ND	---	0.00100	mg/kg dry	1	08/31/17 13:34	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 80 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>103 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	

Apex Laboratories

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Darwin Thomas, Business Development Director

Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.000 Project Manager: Erik Anderson	Reported: 09/03/17 14:50
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ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
8A-N-COMP(2) (A7H0874-01)			Matrix: Soil		Batch: 7081139			
% Solids	83.8	---	1.00	% by Weight	1	09/01/17 08:20	EPA 8000C	
8A-S-COMP(2) (A7H0874-02)			Matrix: Soil		Batch: 7081139			
% Solids	82.8	---	1.00	% by Weight	1	09/01/17 08:20	EPA 8000C	
33A-N-COMP(2) (A7H0874-03)			Matrix: Soil		Batch: 7081139			
% Solids	80.8	---	1.00	% by Weight	1	09/01/17 08:20	EPA 8000C	
33B-N-COMP(2) (A7H0874-04)			Matrix: Soil		Batch: 7081139			
% Solids	86.4	---	1.00	% by Weight	1	09/01/17 08:20	EPA 8000C	
33B-S-COMP(2) (A7H0874-05)			Matrix: Soil		Batch: 7081139			
% Solids	85.6	---	1.00	% by Weight	1	09/01/17 08:20	EPA 8000C	

Apex Laboratories



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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.000
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:50

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7081118 - EPA 3546						Soil						
Blank (7081118-BLK1)						Prepared: 08/31/17 07:28 Analyzed: 08/31/17 11:31						
EPA 8081B												
Dieldrin	ND	---	0.000833	mg/kg wet	1	---	---	---	---	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 91 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>115 %</i>		<i>65-151 %</i>		<i>"</i>					
LCS (7081118-BS1)						Prepared: 08/31/17 07:28 Analyzed: 08/31/17 11:48						
EPA 8081B												
Dieldrin	0.0536	---	0.00100	mg/kg wet	1	0.0500	---	107	56-136%	---	---	Q-41
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 68 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>105 %</i>		<i>65-151 %</i>		<i>"</i>					
Duplicate (7081118-DUP1)						Prepared: 08/31/17 07:28 Analyzed: 08/31/17 12:24						
QC Source Sample: 8A-N-COMP(2) (A7H0874-01)												
EPA 8081B												
Dieldrin	ND	---	0.00105	mg/kg dry	1	---	ND	---	---	---	30%	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 75 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>100 %</i>		<i>65-151 %</i>		<i>"</i>					
Matrix Spike (7081118-MS1)						Prepared: 08/31/17 07:28 Analyzed: 08/31/17 13:52						
QC Source Sample: 33B-S-COMP(2) (A7H0874-05)												
EPA 8081B												
Dieldrin	0.0540	---	0.00105	mg/kg dry	1	0.0524	ND	103	56-136%	---	---	Q-41
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 78 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>102 %</i>		<i>65-151 %</i>		<i>"</i>					

Apex Laboratories

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Darwin Thomas, Business Development Director

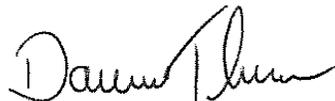
Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.000 Project Manager: Erik Anderson	Reported: 09/03/17 14:50
---	---	------------------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7081139 - Total Solids (Dry Weight)							Soil					

Apex Laboratories



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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.000
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:50

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7081118							
A7H0874-01	Soil	EPA 8081B	08/30/17 15:26	08/31/17 07:28	11.31g/5mL	10g/5mL	0.88
A7H0874-02	Soil	EPA 8081B	08/30/17 15:39	08/31/17 07:28	11.32g/5mL	10g/5mL	0.88
A7H0874-03	Soil	EPA 8081B	08/30/17 13:20	08/31/17 07:28	11.29g/5mL	10g/5mL	0.89
A7H0874-04	Soil	EPA 8081B	08/30/17 13:10	08/31/17 07:28	10.87g/5mL	10g/5mL	0.92
A7H0874-05	Soil	EPA 8081B	08/30/17 13:30	08/31/17 07:28	11.68g/5mL	10g/5mL	0.86

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7081139							
A7H0874-01	Soil	EPA 8000C	08/30/17 15:26	08/31/17 13:05	1N/A/1N/A	1N/A/1N/A	NA
A7H0874-02	Soil	EPA 8000C	08/30/17 15:39	08/31/17 13:05	1N/A/1N/A	1N/A/1N/A	NA
A7H0874-03	Soil	EPA 8000C	08/30/17 13:20	08/31/17 13:05	1N/A/1N/A	1N/A/1N/A	NA
A7H0874-04	Soil	EPA 8000C	08/30/17 13:10	08/31/17 13:05	1N/A/1N/A	1N/A/1N/A	NA
A7H0874-05	Soil	EPA 8000C	08/30/17 13:30	08/31/17 13:05	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories



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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.000
Project Manager: Erik Anderson

Reported:
09/03/17 14:50

Notes and Definitions

Qualifiers:

Q-41 Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.

Notes and Conventions:

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.

RPD Relative Percent Difference

MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.

WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.

Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.

Blank Policy Apex assesses blank data for potential high bias down to a level equal to $\frac{1}{2}$ the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.

For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.

Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.

--- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

*** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.000
Project Manager: Erik Anderson

Reported:
09/03/17 14:50

CHAIN OF CUSTODY

Lab # A7H0874 coc 1.03

APEX LABS

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: PAS ANDERSON GEO Project Mgr: ERIC ANDERSON Project Name: 1503.000 Project #: Northstar

Address: _____ Email: eric@andgeo.com

Sampled by: Mike Golden/PBS Phone: _____ Fax: _____

Site Location: OR WA _____

SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	ANALYSIS REQUEST		
					RCRA Metals (B)	TCLP Metals (B)	AL SR, AS, BA, BE, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ
8A-N-COMP (a)	8/30/17	1526	S	1			
8A-S-COMP (a)	8/30/17	1539	S	1			
33A-N-COMP (a)	8/30/17	1320	S	1			
33B-N-COMP (a)	8/30/17	1310	S	1			
33B-S-COMP (a)	8/30/17	1330	S	1			
8A-NA (a)	8/30/17	1448	S	1			
8A-NB (a)	8/30/17	1508	S	1			
8A-NC (a)	8/30/17	1516	S	1			
8A-ND (a)	8/30/17	1500	S	1			
8A-SA (a)	8/30/17	1424	S	1			

Special Instructions: 2-3 day TAT -> Results need by 9/5/17 9 AM ON COMP SAMPLES. Hold others pend comp results

TAT Requested (circle): 3 Day (circle) NO

Normal Turn Around Time (TAT) = 10 Business Days

RELEASING BY: Mike Golden Date: 8/30/17 Signature: _____

RECEIVED BY: _____ Date: _____ Signature: _____

Printed Name: Mike Golden Printed Name: Kurtin Time: 1705

Company: PBS Company: Apex

Apex Laboratories



Darwin Thomas, Business Development Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.000
Project Manager: Erik Anderson

Reported:
09/03/17 14:50

POB#

CHAIN OF CUSTODY

APEX LABS

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: PBS Anderson Geo		Project Mgr: ERIK ANDERSON		Project Name: 1503 - 000		Project # 1503-000	
Address:		Phone:		Fax:		Email: erik@andersongeo.com	
Sampled by: Mike tolden		Site Location: OR		TCLP Metals (D)		RCRA Metals (D)	
LAB ID #		DATE		TIME		MATRIX	
SAMPLE ID		DATE		TIME		MATRIX	
9A-SB (2)		8/30/17		1432		S	
9A-SC (2)		8/30/17		1441		S	
9A-SD (2)		8/30/17		1445		S	
33A-NA (2)		8/30/17		1127		S	
33A-NB (2)		8/30/17		1145		S	
33A-NC (2)		8/30/17		1137		S	
33A-ND (2)		8/30/17		1119		S	
33B-NA (2)		8/30/17		1157		S	
33B-NB (2)		8/30/17		1245		S	
33B-NC (2)		8/30/17		1227		S	
Normal Turn Around Time (TAT) = 10 Business Days		YES		NO			
TAT Requested (circle)		1 Day		2 Day		3 Day	
		4 DAY		5 DAY		Other:	
RECEIVED BY: [Signature]		DATE: 8/30/17		SIGNATURE: [Signature]		DATE: 8/30/17	
PRINTED NAME: Mike tolden		TIME: 1705		PRINTED NAME: Luciani		TIME: 1705	
COMPANY: Apex		COMPANY: Apex		COMPANY: Apex		COMPANY: Apex	

Apex Laboratories

[Signature]

Darwin Thomas, Business Development Director

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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.000
Project Manager: Erik Anderson

Reported:
09/03/17 14:50

CHAIN OF CUSTODY

APEX LABS Lab # AP10874 POP 3

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geo Project Mgr: Erik Anderson Project Name: 1503.000

Address: Phone: Email: erik@andgeo.com

Sampled by: Mike Giddens Project # 1503.000

Site Location: OR WA Other: Project # 1503.000

SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	ANALYSIS REQUEST			
					WTPH-CHD	WTPH-DS	WTPH-GS	WTPH-LN
33B-ND (2)	8/24/17	1205	S	1				
33B-SA (2)		1244	S	1				
33B-SB (2)		1255	S	1				
33B-SC (2)		1302	S	1				
33B-SD (2)		1255	S	1				

LAB ID # DATE TIME MATRIX # OF CONTAINERS

Normal Turn Around Time (TAT) = 10 Business Days YES NO

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: NO

SPECIAL INSTRUCTIONS: SEE PAGE 7

RELEASER (BY): RECEIVED (BY):

Signature: Mike Giddens Date: 8/30/17 Signature: Date:

Printed Name: Mike Giddens Time: 1705 Printed Name: Time:

Company: AGS Company: Apex

Apex Laboratories



Darwin Thomas, Business Development Director

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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.000
 Project Manager: Erik Anderson

Reported:
 09/03/17 14:50

APEX LABS COOLER RECEIPT FORM

Client: Anderson Geo Element WO#: A7 H0874

Project/Project #: Northstar

Delivery info:

Date/Time Received: 8/30/17 @ 1705 By: KM

Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Inspected by: KM : 8/30/17 @ 1705

Chain of Custody Included? Yes No Custody Seals? Yes No

Signed/Dated by Client? Yes No

Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>2.8</u>						
Received on Ice? (Y/N)	<input checked="" type="checkbox"/>						
Temp. Blanks? (Y/N)	<input checked="" type="checkbox"/>						
Ice Type: (Gel/Res/Other)	<input checked="" type="checkbox"/>						
Condition:							
Cooler out of temp? (Y/N)	<input checked="" type="checkbox"/>						
Possible reason why: _____							
If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA <input checked="" type="checkbox"/>							

Temperature (deg. C) 2.8

Received on Ice? (Y/N)

Temp. Blanks? (Y/N)

Ice Type: (Gel/Res/Other)

Condition: _____

Cooler out of temp? (Y/N) Possible reason why: _____

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: [Signature] : 8/30/17 @ 1750

All Samples Intact? Yes No Comments: _____

Bottle Labels/COCs agree? Yes No Comments: _____

Containers/Volumes Received Appropriate for Analysis? Yes No Comments: _____

Do VOA Vials have Visible Headspace? Yes No NA

Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes No NA

Comments: _____

Additional Information: _____

Labeled by: [Signature] Witness: AKK Cooler Inspected by: [Signature] See Project Contact Form: Y

Darwin Thomas

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Wednesday, September 13, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

RE: Northstar / 1503.10

Enclosed are the results of analyses for work order A710105, which was received by the laboratory on 9/6/2017 at 1:25:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darrell Auvil For Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.10
Project Manager: Erik Anderson

Reported:
09/13/17 11:22

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
13B-N-Comp (3)	A7I0105-01	Soil	09/06/17 11:44	09/06/17 13:25
14A-N-Comp (3)	A7I0105-02	Soil	09/06/17 12:02	09/06/17 13:25
13B-SB (3)	A7I0105-07	Soil	09/06/17 12:06	09/06/17 13:25
13B-SC (3)	A7I0105-08	Soil	09/06/17 12:08	09/06/17 13:25
15A-ND (2)	A7I0105-13	Soil	09/06/17 10:46	09/06/17 13:25
15A-SA (2)	A7I0105-14	Soil	09/06/17 10:44	09/06/17 13:25
15A-SD (2)	A7I0105-15	Soil	09/06/17 10:42	09/06/17 13:25
33D-SD (2)	A7I0105-16	Soil	09/06/17 10:01	09/06/17 13:25

Apex Laboratories



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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 09/13/17 11:22

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting			Date Analyzed	Method	Notes
			Limit	Units	Dilution			
13B-N-Comp (3) (A7I0105-01)			Matrix: Soil		Batch: 7090346			
Dieldrin	33.1	---	1.11	ug/kg dry	1	09/07/17 13:04	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 80 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			94 %	Limits: 65-151 %	"	"	"	
14A-N-Comp (3) (A7I0105-02)			Matrix: Soil		Batch: 7090346			
Dieldrin	ND	---	1.13	ug/kg dry	1	09/07/17 13:21	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 80 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			89 %	Limits: 65-151 %	"	"	"	
13B-SB (3) (A7I0105-07)			Matrix: Soil		Batch: 7090346			
Dieldrin	1.28	---	1.07	ug/kg dry	1	09/07/17 13:39	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 88 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			105 %	Limits: 65-151 %	"	"	"	
13B-SC (3) (A7I0105-08)			Matrix: Soil		Batch: 7090346			
Dieldrin	ND	---	1.05	ug/kg dry	1	09/07/17 13:57	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 84 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			97 %	Limits: 65-151 %	"	"	"	
15A-ND (2) (A7I0105-13)			Matrix: Soil		Batch: 7090346			
Dieldrin	1.69	---	1.08	ug/kg dry	1	09/07/17 14:14	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 82 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			91 %	Limits: 65-151 %	"	"	"	
15A-SA (2) (A7I0105-14)			Matrix: Soil		Batch: 7090383			
Dieldrin	ND	---	1.06	ug/kg dry	1	09/08/17 14:28	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 76 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			79 %	Limits: 65-151 %	"	"	"	
15A-SD (2) (A7I0105-15)			Matrix: Soil		Batch: 7090383			
Dieldrin	ND	---	1.11	ug/kg dry	1	09/08/17 13:55	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 89 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			102 %	Limits: 65-151 %	"	"	"	
33D-SD (2) (A7I0105-16)			Matrix: Soil		Batch: 7090383			
Dieldrin	ND	---	1.13	ug/kg dry	1	09/08/17 14:12	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			Recovery: 89 %	Limits: 42-129 %	"	"	"	
Decachlorobiphenyl (Surr)			102 %	Limits: 65-151 %	"	"	"	

Apex Laboratories

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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 09/13/17 11:22

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
13B-N-Comp (3) (A7I0105-01)			Matrix: Soil		Batch: 7090356			
% Solids	87.2	---	1.00	% by Weight	1	09/07/17 08:15	EPA 8000C	
14A-N-Comp (3) (A7I0105-02)			Matrix: Soil		Batch: 7090356			
% Solids	84.6	---	1.00	% by Weight	1	09/07/17 08:15	EPA 8000C	
13B-SB (3) (A7I0105-07)			Matrix: Soil		Batch: 7090356			
% Solids	90.1	---	1.00	% by Weight	1	09/07/17 08:15	EPA 8000C	
13B-SC (3) (A7I0105-08)			Matrix: Soil		Batch: 7090356			
% Solids	90.2	---	1.00	% by Weight	1	09/07/17 08:15	EPA 8000C	
15A-ND (2) (A7I0105-13)			Matrix: Soil		Batch: 7090394			
% Solids	88.2	---	1.00	% by Weight	1	09/08/17 08:11	EPA 8000C	
15A-SA (2) (A7I0105-14)			Matrix: Soil		Batch: 7090394			
% Solids	91.2	---	1.00	% by Weight	1	09/08/17 08:11	EPA 8000C	
15A-SD (2) (A7I0105-15)			Matrix: Soil		Batch: 7090394			
% Solids	87.6	---	1.00	% by Weight	1	09/08/17 08:11	EPA 8000C	
33D-SD (2) (A7I0105-16)			Matrix: Soil		Batch: 7090394			
% Solids	85.2	---	1.00	% by Weight	1	09/08/17 08:11	EPA 8000C	

Apex Laboratories

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Darrell Auvil For Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.10
Project Manager: Erik Anderson

Reported:
09/13/17 11:22

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7090346 - EPA 3546						Soil						
Blank (7090346-BLK1)						Prepared: 09/06/17 11:16 Analyzed: 09/07/17 12:29						
EPA 8081B												
Dieldrin	ND	---	0.909	ug/kg wet	1	---	---	---	---	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			Recovery: 95 %		Limits: 42-129 %		Dilution: 1x					
<i>Decachlorobiphenyl (Surr)</i>			112 %		65-151 %		"					
LCS (7090346-BS1)						Prepared: 09/06/17 11:16 Analyzed: 09/07/17 12:46						
EPA 8081B												
Dieldrin	47.0	---	1.00	ug/kg wet	1	50.0	---	94	56-136%	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			Recovery: 87 %		Limits: 42-129 %		Dilution: 1x					
<i>Decachlorobiphenyl (Surr)</i>			102 %		65-151 %		"					
Batch 7090383 - EPA 3546						Soil						
Blank (7090383-BLK1)						Prepared: 09/07/17 09:47 Analyzed: 09/08/17 13:53						
EPA 8081B												
Dieldrin	ND	---	0.909	ug/kg wet	1	---	---	---	---	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			Recovery: 86 %		Limits: 42-129 %		Dilution: 1x					
<i>Decachlorobiphenyl (Surr)</i>			100 %		65-151 %		"					
LCS (7090383-BS1)						Prepared: 09/07/17 09:47 Analyzed: 09/08/17 14:11						
EPA 8081B												
Dieldrin	48.5	---	1.00	ug/kg wet	1	50.0	---	97	56-136%	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			Recovery: 89 %		Limits: 42-129 %		Dilution: 1x					
<i>Decachlorobiphenyl (Surr)</i>			101 %		65-151 %		"					
Duplicate (7090383-DUP1)						Prepared: 09/07/17 09:47 Analyzed: 09/08/17 14:46						
QC Source Sample: 15A-SA (2) (A710105-14)												
EPA 8081B												
Dieldrin	ND	---	1.06	ug/kg dry	1	---	ND	---	---	---	30%	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			Recovery: 64 %		Limits: 42-129 %		Dilution: 1x					
<i>Decachlorobiphenyl (Surr)</i>			73 %		65-151 %		"					
Matrix Spike (7090383-MS1)						Prepared: 09/07/17 09:47 Analyzed: 09/08/17 14:30						
QC Source Sample: 33D-SD (2) (A710105-16)												
EPA 8081B												
Dieldrin	55.6	---	1.13	ug/kg dry	1	56.5	0.654	97	56-136%	---	---	

Apex Laboratories

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Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/13/17 11:22
---	--	------------------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	-----------------	-------	------	--------------	---------------	------	-------------	-----	-----------	-------

Batch 7090383 - EPA 3546

Soil

Matrix Spike (7090383-MS1)

Prepared: 09/07/17 09:47 Analyzed: 09/08/17 14:30

QC Source Sample: 33D-SD (2) (A7I0105-16)

EPA 8081B

<i>Surr: 2,4,5,6-TCMX (Surr)</i>	<i>Recovery: 94 %</i>	<i>Limits: 42-129 %</i>	<i>Dilution: 1x</i>
<i>Decachlorobiphenyl (Surr)</i>	<i>109 %</i>	<i>65-151 %</i>	<i>"</i>

Apex Laboratories



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Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/13/17 11:22
---	--	------------------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7090356 - Total Solids (Dry Weight)						Soil						
Duplicate (7090356-DUP4)						Prepared: 09/06/17 16:08 Analyzed: 09/07/17 08:15						
QC Source Sample: 13B-SC (3) (A7I0105-08)												
EPA 8000C												
% Solids	90.3	---	1.00	% by Weight	1	---	90.2	---	---	0.02	10%	

Batch 7090394 - Total Solids (Dry Weight)						Soil						
--	--	--	--	--	--	-------------	--	--	--	--	--	--

Apex Laboratories



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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 09/13/17 11:22

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7090346							
A7I0105-01	Soil	EPA 8081B	09/06/17 11:44	09/06/17 15:28	10.29g/5mL	10g/5mL	0.97
A7I0105-02	Soil	EPA 8081B	09/06/17 12:02	09/06/17 15:28	10.44g/5mL	10g/5mL	0.96
A7I0105-07	Soil	EPA 8081B	09/06/17 12:06	09/06/17 15:28	10.36g/5mL	10g/5mL	0.97
A7I0105-08	Soil	EPA 8081B	09/06/17 12:08	09/06/17 15:28	10.52g/5mL	10g/5mL	0.95
A7I0105-13	Soil	EPA 8081B	09/06/17 10:46	09/06/17 15:28	10.51g/5mL	10g/5mL	0.95
Batch: 7090383							
A7I0105-14	Soil	EPA 8081B	09/06/17 10:44	09/07/17 09:47	10.35g/5mL	10g/5mL	0.97
A7I0105-15	Soil	EPA 8081B	09/06/17 10:42	09/07/17 09:47	10.31g/5mL	10g/5mL	0.97
A7I0105-16	Soil	EPA 8081B	09/06/17 10:01	09/07/17 09:47	10.4g/5mL	10g/5mL	0.96

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7090356							
A7I0105-01	Soil	EPA 8000C	09/06/17 11:44	09/06/17 14:48	1N/A/1N/A	1N/A/1N/A	NA
A7I0105-02	Soil	EPA 8000C	09/06/17 12:02	09/06/17 14:48	1N/A/1N/A	1N/A/1N/A	NA
A7I0105-07	Soil	EPA 8000C	09/06/17 12:06	09/06/17 14:48	1N/A/1N/A	1N/A/1N/A	NA
A7I0105-08	Soil	EPA 8000C	09/06/17 12:08	09/06/17 14:48	1N/A/1N/A	1N/A/1N/A	NA
Batch: 7090394							
A7I0105-13	Soil	EPA 8000C	09/06/17 10:46	09/07/17 14:19	1N/A/1N/A	1N/A/1N/A	NA
A7I0105-14	Soil	EPA 8000C	09/06/17 10:44	09/07/17 14:19	1N/A/1N/A	1N/A/1N/A	NA
A7I0105-15	Soil	EPA 8000C	09/06/17 10:42	09/07/17 14:19	1N/A/1N/A	1N/A/1N/A	NA
A7I0105-16	Soil	EPA 8000C	09/06/17 10:01	09/07/17 14:19	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories



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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.10
Project Manager: Erik Anderson

Reported:
09/13/17 11:22

Notes and Definitions

Qualifiers:

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch
QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank
Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- *** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories



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Darrell Auvil For Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: **Northstar**
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 09/13/17 11:22

APEX LABS CHAIN OF CUSTODY Lab # AF71005 COC 1 of 2

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological Project Mgr: Erik Anderson

Address: _____ Project Name: Northstar

POB: _____ Project #: 1503 10

Sampled by: E. Anderson Phone: _____ Email: _____

Site Location: WA

Other: _____

SAMPLE ID

1 13B-N-Comp (3)

2 14A-N-Comp (3)

3 13B-NA (3)

4 13B-MB (3)

5 13B-NL (3)

6 13B-NV (3)

7 13B-SB (3)

8 13B-SC (3)

9 14A-NA (3)

10 14A-MB (3)

ANALYSIS REQUEST

LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	SWTH-ICID	SWTH-DX	SWTH-GX	8760 VOCs, PHTLAD	8760 RBDN VOCs	8760 HVOCs	8760 BTEX VOCs	8770 SVOC	8770 SEM PATHS	8082 PCBs	609 TIO	RCRA Metals (B)	TCLP Metals (B)	Al, Si, Ar, Ba, Bi, Br, Ca, Cd, Cs, Cr, Cu, Fe, Pb, Rn, Sr, Mg, Mn, Ni, SL, Zn	TOTAL DISS TC1P	Ag, As, Na, TC, V, Zn	
	9/6/17	11:44	S	1																	
	"	12:02		1																	
	"	11:36		1																	
	"	11:38		1																	
	"	11:40		1																	
	"	11:42		1																	
	"	12:06		1																	
	"	12:08		1																	
	"	11:54		1																	
	"	11:56		1																	

SPECIAL INSTRUCTIONS:
See T/A times for individual samples

TAT Requested (circle): 1 Day 2 Day 3 Day
 4 DAY 5 DAY Other: _____

SAMPLES ARE HELD FOR 30 DAYS

RELIQUISHED BY: E.A. Date: 9/6/17 Signature: [Signature] Date: 9/13/17
 Printed Name: Erik Anderson Printed Name: AMISSA KEGER Time: 13:25
 Company: Ag1 Company: Apex Labs

RECEIVED BY: _____ Signature: _____ Date: _____
 Printed Name: _____ Time: _____ Company: _____

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.10
Project Manager: Erik Anderson

Reported:
09/13/17 11:22

CHAIN OF CUSTODY

Lab # **APEX105** PO# **1503.10**

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Anderson Geological		Project Mgr: Erik Anderson		Project Name: Northstar		Project # 1503.10																																																																																																																																	
Address:		Phone:		Fax:		Email:																																																																																																																																	
Sampled by: E. Anderson		Site Location: WA		Other:																																																																																																																																			
SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	YES	NO																																																																																																																																
14A-NC(3)		9/16/17	11:58	S	1																																																																																																																																		
14A-ND(3)			12:00	S	1																																																																																																																																		
15A-ND(2)			10:46	S	1																																																																																																																																		
15A-SA(2)			10:44	S	1																																																																																																																																		
15A-SD(2)			10:42	S	1																																																																																																																																		
33D-SD(2)			10:01	S	1																																																																																																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="8">ANALYSIS REQUEST</th> </tr> <tr> <td>AL, SR, AS, BA, BR, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TCRF Metals (B)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>TCRF Metals (B)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>600 TTO</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>RCRA Metals (B)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8082 PCBs</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8170 SIM PAHs</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8170 SVOC</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8260 BTEX VOCs</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8260 HVOCS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8260 RBDN VOCs</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8360 VOCs, P&Hs</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NMTH-GA</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NMTH-DN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NMTH-ICID</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>								ANALYSIS REQUEST								AL, SR, AS, BA, BR, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ								TCRF Metals (B)								TCRF Metals (B)								600 TTO								RCRA Metals (B)								8082 PCBs								8170 SIM PAHs								8170 SVOC								8260 BTEX VOCs								8260 HVOCS								8260 RBDN VOCs								8360 VOCs, P&Hs								NMTH-GA								NMTH-DN								NMTH-ICID							
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<p>SAMPLES ARE HELD FOR 30 DAYS</p> <p>RECEIVED BY: Erik Anderson Date: 9/16/17 Signature: <i>[Signature]</i></p> <p>RECEIVED BY: AMISSA KEPA Date: 9/13/17 Signature: <i>[Signature]</i></p> <p>Printed Name: Erik Anderson Printed Name: AMISSA KEPA Title: 1325</p> <p>Company: AGI Company: Apex Labs</p>																																																																																																																																							

Apex Laboratories



Darrell Auvil For Darwin Thomas, Business Development Director

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Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/13/17 11:22
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APEX LABS COOLER RECEIPT FORM

Client: Anderson Geological Element WO#: A7 ID105
 Project/Project #: Northstar/1503.10

Delivery info:

Date/Time Received: 9/6/17 @ 1325 By: AKK
 Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Inspected by: AKK : 9/6/17 @ 1325

Chain of Custody Included? Yes No Custody Seals? Yes No
 Signed/Dated by Client? Yes No
 Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>2.5</u>						
Received on Ice? (Y/N)	<u>(Y)</u>						
Temp. Blanks? (Y/N)	<u>(N)</u>						
Ice Type: (Gel/Real/Other)	<u>(Gel)</u>						
Condition:	<u>good</u>						

Cooler out of temp? (Y/N) Possible reason why: _____
 If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: AKK : 9/6/17 @ 1330

All Samples Intact? Yes No Comments: _____

Bottle Labels/COCs agree? Yes No Comments: AKK 9/6/17 13B-N-comp (3) → 15A-SD(2) NOT on Cent.

Containers/Volumes Received Appropriate for Analysis? Yes No Comments: _____

Do VOA Vials have Visible Headspace? Yes No NA

Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes No NA

Comments: _____

Additional Information: _____

Labeled by: _____ Witness: _____ Cooler Inspected by: _____ See Project Contact Form: Y

AKK [Signature] Client



Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Wednesday, September 13, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

RE: Northstar / 1503.10

Enclosed are the results of analyses for work order A710190, which was received by the laboratory on 9/8/2017 at 12:57:00PM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



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Darrell Auvil For Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.10
Project Manager: Erik Anderson

Reported:
09/13/17 11:30

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
13B-N-COMP(4)	A7I0190-01	Soil	09/08/17 12:12	09/08/17 12:57

Apex Laboratories



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Darrell Auvil For Darwin Thomas, Business Development Director

Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/13/17 11:30
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ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
13B-N-COMP(4) (A7I0190-01)			Matrix: Soil		Batch: 7090454			
Dieldrin	ND	---	1.15	ug/kg dry	1	09/11/17 16:12	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 84 %</i>	<i>Limits: 42-129 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>118 %</i>	<i>Limits: 65-151 %</i>	"	"	"	<i>Q-41</i>

Apex Laboratories



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Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/13/17 11:30
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ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
13B-N-COMP(4) (A710190-01)			Matrix: Soil		Batch: 7090457			
% Solids	84.0	---	1.00	% by Weight	1	09/11/17 08:04	EPA 8000C	

Apex Laboratories



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Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.10
Project Manager: Erik Anderson

Reported:
09/13/17 11:30

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7090454 - EPA 3546						Soil						
Blank (7090454-BLK1)						Prepared: 09/08/17 14:59 Analyzed: 09/11/17 15:36						
EPA 8081B												
Dieldrin	ND	---	0.909	ug/kg wet	1	---	---	---	---	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 92 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>118 %</i>		<i>65-151 %</i>		<i>"</i>					
<i>Q-41</i>												
LCS (7090454-BS1)						Prepared: 09/08/17 14:59 Analyzed: 09/11/17 15:54						
EPA 8081B												
Dieldrin	46.6	---	1.00	ug/kg wet	1	50.0	---	93	56-136%	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 89 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>114 %</i>		<i>65-151 %</i>		<i>"</i>					
<i>Q-41</i>												
Matrix Spike (7090454-MS1)						Prepared: 09/08/17 14:59 Analyzed: 09/11/17 16:29						
QC Source Sample: 13B-N-COMP(4) (A710190-01)												
EPA 8081B												
Dieldrin	57.9	---	1.15	ug/kg dry	1	57.5	ND	99	56-136%	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 80 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>121 %</i>		<i>65-151 %</i>		<i>"</i>					
<i>Q-41</i>												

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Darrell Auvil For Darwin Thomas, Business Development Director

Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/13/17 11:30
---	--	------------------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7090457 - Total Solids (Dry Weight)						Soil						
Duplicate (7090457-DUP5)						Prepared: 09/08/17 15:20 Analyzed: 09/11/17 08:04						
QC Source Sample: 13B-N-COMP(4) (A7I0190-01)												
EPA 8000C												
% Solids	83.4	---	1.00	% by Weight	1	---	84.0	---	---	0.8	10%	

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/13/17 11:30
---	--	------------------------------------

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7090454							
A710190-01	Soil	EPA 8081B	09/08/17 12:12	09/08/17 14:59	10.34g/5mL	10g/5mL	0.97

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7090457							
A710190-01	Soil	EPA 8000C	09/08/17 12:12	09/08/17 15:17	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.10
Project Manager: Erik Anderson

Reported:
09/13/17 11:30

Notes and Definitions

Qualifiers:

Q-41 Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.

Notes and Conventions:

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.

RPD Relative Percent Difference

MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.

WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.

Batch QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.

Blank Policy Apex assesses blank data for potential high bias down to a level equal to $\frac{1}{2}$ the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.

For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.

Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.

--- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

*** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Darrell Auvil For Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 09/13/17 11:30

CHAIN OF CUSTODY

Lab # AT10190 POP # 1503.10

Company: Anderson Geological Project Mgr: Erik Anderson Project Name: Northstar Project # 1503.10

Address: _____ Phone: _____ Email: _____

Sampled by: E. Anderson

SIR Location: WA

Other: _____

SAMPLE ID	DATE	TIME	MATRIX	# OF CONTAINERS	NWTR-HCID	NWTR-DX	NWTR-GX	R260 VOCs, Full Lab	R260 RBDV VOCs	R260 HVOCs	R260 BTEX VOCs	R270 SVOC	R270 SIM PAHS	8082 PCBs	600 TTO	RCRA Metals (R)	TCLP Metals (R)	AL SR, AS, HA, PC, CA	HE, MG, MN, NI, CU, FE, CR, ZN, AG, NA, TL, V, Zn	TOTAL DISS TCLP	1200-COLS	1200-Z	Ppt BOD5 Dieldrin		
136-NComp(4)	9/11/17	12:12	S	1																				X	
136-NA(4)	"	12:02	S	1																					
136-NB(4)	"	12:04	S	1																					
136-MC(4)	"	12:06	S	1																					
136-MD(4)	"	12:08	S	1																					

Normal Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: _____

SPECIAL INSTRUCTIONS:

RELINQUISHED BY: Erik Anderson Date: 9/13/17 Signature: [Signature] Time: 1:57 Company: AG1

RECEIVED BY: _____ Date: _____ Signature: _____ Time: _____ Company: _____

RELINQUISHED BY: _____ Date: _____ Signature: _____ Time: _____ Company: _____

RECEIVED BY: _____ Date: _____ Signature: _____ Time: _____ Company: _____

SAMPLES ARE HELD FOR 90 DAYS

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

[Signature]

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 09/13/17 11:30

APEX LABS COOLER RECEIPT FORM

Client: Anderson Geological Element WO#: A7 E0190

Project/Project #: Northstar / 1503.10

Delivery info:

Date/Time Received: 9/8/17 @ 1257 By: (Signature)

Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Inspected by: (Signature) : 9/8/17 @ 1257

Chain of Custody Included? Yes No Custody Seals? Yes No

Signed/Dated by Client? Yes No

Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>4.3</u>						
Received on Ice? (Y/N)	<u>(Y)</u>						
Temp. Blanks? (Y/N)	<u>(N)</u>						
Ice Type: (Gel/Real/Other)	<u>(Gel)</u>						
Condition:	<u>good</u>						

Cooler out of temp? (Y/N) Possible reason why: _____

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: (Signature) : 9/8/17 @ 1302

All Samples Intact? Yes No Comments: _____

Bottle Labels/COCs agree? Yes No Comments: NO T on containers, no

P/T on container SB (8) 13B-NB(4)

Containers/Volumes Received Appropriate for Analysis? Yes No Comments: _____

Do VOA Vials have Visible Headspace? Yes No NA

Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes No NA

Comments: _____

Additional Information: _____

(Signature)

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Thursday, September 14, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

RE: Northstar / 1503.10

Enclosed are the results of analyses for work order A710308, which was received by the laboratory on 9/13/2017 at 10:33:00AM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darrell Auvil For Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.10
Project Manager: Erik Anderson

Reported:
09/14/17 17:03

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
14A-S-COMP(2)	A7I0308-01	Soil	09/13/17 09:40	09/13/17 10:33

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darrell Auvil For Darwin Thomas, Business Development Director

Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/14/17 17:03
---	--	------------------------------------

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
14A-S-COMP(2) (A7I0308-01)			Matrix: Soil	Batch: 7090580				
Dieldrin	3.55	---	1.09	ug/kg dry	1	09/14/17 12:14	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 84 %</i>	<i>Limits: 42-129 %</i>	"	"	"	
<i>Decachlorobiphenyl (Surr)</i>			<i>102 %</i>	<i>Limits: 65-151 %</i>	"	"	"	

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/14/17 17:03
---	--	------------------------------------

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight								
--------------------	--	--	--	--	--	--	--	--

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
14A-S-COMP(2) (A710308-01)			Matrix: Soil		Batch: 7090585			
% Solids	89.4	---	1.00	% by Weight	1	09/14/17 08:13	EPA 8000C	

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 09/14/17 17:03

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7090580 - EPA 3546						Soil						
Blank (7090580-BLK1)						Prepared: 09/13/17 12:32 Analyzed: 09/14/17 11:39						
EPA 8081B												
Dieldrin	ND	---	0.909	ug/kg wet	1	---	---	---	---	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 88 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>126 %</i>	<i>65-151 %</i>		<i>"</i>						
LCS (7090580-BS1)						Prepared: 09/13/17 12:32 Analyzed: 09/14/17 11:56						
EPA 8081B												
Dieldrin	56.4	---	1.00	ug/kg wet	1	50.0	---	113	56-136%	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 89 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>121 %</i>	<i>65-151 %</i>		<i>"</i>						
Duplicate (7090580-DUP1)						Prepared: 09/13/17 12:32 Analyzed: 09/14/17 12:31						
QC Source Sample: 14A-S-COMP(2) (A710308-01)												
EPA 8081B												
Dieldrin	3.92	---	1.09	ug/kg dry	1	---	3.55	---	---	10	30%	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 79 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>114 %</i>	<i>65-151 %</i>		<i>"</i>						
Matrix Spike (7090580-MS1)						Prepared: 09/13/17 12:32 Analyzed: 09/14/17 12:49						
QC Source Sample: 14A-S-COMP(2) (A710308-01)												
EPA 8081B												
Dieldrin	60.6	---	1.09	ug/kg dry	1	54.4	3.55	105	56-136%	---	---	
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 83 %</i>	<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>						
<i>Decachlorobiphenyl (Surr)</i>			<i>112 %</i>	<i>65-151 %</i>		<i>"</i>						



Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/14/17 17:03
---	--	------------------------------------

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7090585 - Total Solids (Dry Weight)						Soil						
Duplicate (7090585-DUP2)						Prepared: 09/13/17 13:36 Analyzed: 09/14/17 08:13						
QC Source Sample: 14A-S-COMP(2) (A710308-01)												
EPA 8000C												
% Solids	89.2	---	1.00	% by Weight	1	---	89.4	---	---	0.2	10%	

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological PO Box 649 Wilsonville, OR 97070	Project: Northstar Project Number: 1503.10 Project Manager: Erik Anderson	Reported: 09/14/17 17:03
---	--	------------------------------------

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7090580							
A710308-01	Soil	EPA 8081B	09/13/17 09:40	09/13/17 12:32	10.25g/5mL	10g/5mL	0.98

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7090585							
A710308-01	Soil	EPA 8000C	09/13/17 09:40	09/13/17 13:36	1N/A/1N/A	1N/A/1N/A	NA

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.10
Project Manager: Erik Anderson

Reported:
09/14/17 17:03

Notes and Definitions

Qualifiers:

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch
QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank
Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- *** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Darrell Auvil For Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 09/14/17 17:03

CHAIN OF CUSTODY

Company: **Anderson Geological** Lab # **ATE-0808** Project # **1503.10**

Address: **12232 S.W. Garden Place, Tigard, OR 97223** Ph: 503-718-2323 Fax: 503-718-0333

Project Mgr: **Erik Anderson** Project Name: **Northstar** PO#

Sampled by: **E. Anderson**

Site Location: WA OR

LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTFH-CID	NWTFH-DS	NWTFH-GS	8260 VOCs Full List	8260 RBDV VOCs	8260 BVOCs	8260 BTEX VOCs	8270 SVOC	8270 SEM PAHs	8082 PCBs	600 TTO	RCRA Metals (P)	TCLP Metals (P)	AL SR, AS, BS, BA, CA, CB, CC, CD, CE, CF, CG, CH, CI, CL, CM, CN, CO, CP, CR, CS, CT, CU, CV, CW, CX, CY, CZ	TOTAL DISS. TCFP	1209-COLS	1209-Z	EMPA/PAH/PCB/PA
14A-5-60MP(2)	9/13/17	09:40	S	1																	X	
14A-54(2)	9/13/17	09:20	S	1																		
14A-58(2)	9/13/17	09:32	S	1																		
14A-56(2)	9/13/17	09:34	S	1																		
14A-50(2)	9/13/17	09:36	S	1																		

Normal Turn Around Time (TAT) = 10 Business Days 2 Day 3 Day 4 DAY 5 DAY Other: _____

TAT Requested (circle) **2 Day**

SAMPLES ARE HELD FOR 30 DAYS

RELENGISHED BY: **Erik Anderson** Date: **9/13/17** Signature: *[Signature]* RECEIVED BY: _____ Date: _____ Signature: _____

Printed Name: **Erik Anderson** Title: **PM** Printed Name: **Sundt** Title: **1033** Company: **AGI** Company: _____

Apex Laboratories

[Signature]

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 09/14/17 17:03

APEX LABS COOLER RECEIPT FORM

Client: Anderson Geo Element WO#: A7 I0308

Project/Project #: Northstar / 1503.10

Delivery info:

Date/Time Received: 9/13/17 @ 1033 By: [Signature]

Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Inspected by: [Signature] : 9/13/17 @ 1033

Chain of Custody Included? Yes No Custody Seals? Yes No

Signed/Dated by Client? Yes No

Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>0.3</u>						
Received on Ice? (Y/N)							
Temp. Blanks? (Y/N)							
Ice Type: (Gel/Real/Other)							
Condition:	<u>SDO</u>						

Temperature (deg. C)

Received on Ice? (Y/N)

Temp. Blanks? (Y/N)

Ice Type: (Gel/Real/Other)

Condition:

Cooler out of temp? (Y/N) Possible reason why:

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: [Signature] : 9/13/17 @ 1035

All Samples Intact? Yes No Comments: _____

Bottle Labels/COCs agree? Yes No Comments: No Top containers

Containers/Volumes Received Appropriate for Analysis? Yes No Comments: _____

Do VOA Vials have Visible Headspace? Yes No NA

Comments: _____

Water Samples: pH Checked and Appropriate (except VOAs): Yes No NA

Comments: _____

Additional Information: _____

Labeled by: [Signature] Witness: [Signature] Cooler Inspected by: Client unloaded See Project Contact Form: Y

[Signature]

Apex Labs

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323 Phone
503-718-0333 Fax

Friday, October 13, 2017

Erik Anderson
Anderson Geological
PO Box 649
Wilsonville, OR 97070

RE: Northstar / 1503.10

Enclosed are the results of analyses for work order A710280, which was received by the laboratory on 9/12/2017 at 9:04:00AM.

Thank you for using Apex Labs. We appreciate your business and strive to provide the highest quality services to the environmental industry.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: dthomas@apex-labs.com, or by phone at 503-718-2323.

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: **Northstar**
Project Number: 1503.10
Project Manager: Erik Anderson

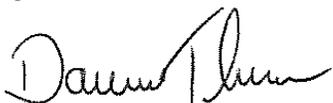
Reported:
10/13/17 13:54

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Tower9-E6	A7I0280-01	Soil	09/11/17 14:20	09/12/17 09:04
Tower9-E18	A7I0280-02	Soil	09/11/17 14:22	09/12/17 09:04
Tower9-W6	A7I0280-03	Soil	09/11/17 14:29	09/12/17 09:04
Tower9-W18	A7I0280-04	Soil	09/11/17 14:32	09/12/17 09:04

Apex Laboratories



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Darwin Thomas, Business Development Director

Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 10/13/17 13:54

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting		Dilution	Date Analyzed	Method	Notes
			Limit	Units				
Tower9-E6 (A710280-01)			Matrix: Soil		Batch: 7090536			
Dieldrin	0.0612	---	0.00105	mg/kg dry	1	09/13/17 14:46	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 77 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>93 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
Tower9-E18 (A710280-02)			Matrix: Soil		Batch: 7090536			
Dieldrin	0.0191	---	0.00110	mg/kg dry	1	09/13/17 15:04	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 55 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>74 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
Tower9-W6 (A710280-03)			Matrix: Soil		Batch: 7090536			
Dieldrin	0.0941	---	0.00100	mg/kg dry	1	09/13/17 15:21	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 69 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>93 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	
Tower9-W18 (A710280-04)			Matrix: Soil		Batch: 7090536			
Dieldrin	0.0447	---	0.00108	mg/kg dry	1	09/13/17 15:39	EPA 8081B	
<i>Surrogate: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 71 %</i>		<i>Limits: 42-129 %</i>		<i>"</i>	
<i>Decachlorobiphenyl (Surr)</i>			<i>90 %</i>		<i>Limits: 65-151 %</i>		<i>"</i>	

Apex Laboratories



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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 10/13/17 13:54

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Date Analyzed	Method	Notes
Tower9-E6 (A7I0280-01)			Matrix: Soil		Batch: 7090585			
% Solids	91.5	---	1.00	% by Weight	1	09/14/17 08:13	EPA 8000C	
Tower9-E18 (A7I0280-02)			Matrix: Soil		Batch: 7090585			
% Solids	86.0	---	1.00	% by Weight	1	09/14/17 08:13	EPA 8000C	
Tower9-W6 (A7I0280-03)			Matrix: Soil		Batch: 7090585			
% Solids	93.3	---	1.00	% by Weight	1	09/14/17 08:13	EPA 8000C	
Tower9-W18 (A7I0280-04)			Matrix: Soil		Batch: 7090585			
% Solids	89.4	---	1.00	% by Weight	1	09/14/17 08:13	EPA 8000C	

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Reported:
 10/13/17 13:54

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7090536 - EPA 3546						Soil						
Blank (7090536-BLK1)						Prepared: 09/12/17 13:26 Analyzed: 09/13/17 14:12						
EPA 8081B												
Dieldrin	ND	---	0.000909	mg/kg wet	1	---	---	---	---	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 85 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>115 %</i>		<i>65-151 %</i>		<i>"</i>					
LCS (7090536-BS1)						Prepared: 09/12/17 13:26 Analyzed: 09/13/17 14:29						
EPA 8081B												
Dieldrin	0.0520	---	0.00100	mg/kg wet	1	0.0500	---	104	56-136%	---	---	---
<i>Surr: 2,4,5,6-TCMX (Surr)</i>			<i>Recovery: 84 %</i>		<i>Limits: 42-129 %</i>		<i>Dilution: 1x</i>					
<i>Decachlorobiphenyl (Surr)</i>			<i>111 %</i>		<i>65-151 %</i>		<i>"</i>					

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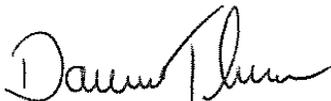
Reported:
10/13/17 13:54

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	MDL	Reporting Limit	Units	Dil.	Spike Amount	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 7090585 - Total Solids (Dry Weight)							Soil					

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Darwin Thomas, Business Development Director

Anderson Geological
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 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 10/13/17 13:54

SAMPLE PREPARATION INFORMATION

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7090536							
A7I0280-01	Soil	EPA 8081B	09/11/17 14:20	09/12/17 16:27	10.38g/5mL	10g/5mL	0.96
A7I0280-02	Soil	EPA 8081B	09/11/17 14:22	09/12/17 16:27	10.56g/5mL	10g/5mL	0.95
A7I0280-03	Soil	EPA 8081B	09/11/17 14:29	09/12/17 16:27	10.7g/5mL	10g/5mL	0.94
A7I0280-04	Soil	EPA 8081B	09/11/17 14:32	09/12/17 16:27	10.34g/5mL	10g/5mL	0.97

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 7090585							
A7I0280-01	Soil	EPA 8000C	09/11/17 14:20	09/13/17 13:36	1N/A/1N/A	1N/A/1N/A	NA
A7I0280-02	Soil	EPA 8000C	09/11/17 14:22	09/13/17 13:36	1N/A/1N/A	1N/A/1N/A	NA
A7I0280-03	Soil	EPA 8000C	09/11/17 14:29	09/13/17 13:36	1N/A/1N/A	1N/A/1N/A	NA
A7I0280-04	Soil	EPA 8000C	09/11/17 14:32	09/13/17 13:36	1N/A/1N/A	1N/A/1N/A	NA

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Reported:
10/13/17 13:54

Notes and Definitions

Qualifiers:

Notes and Conventions:

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis. Results listed as 'wet' or without 'dry' designation are not dry weight corrected.
- RPD Relative Percent Difference
- MDL If MDL is not listed, data has been evaluated to the Method Reporting Limit only.
- WMSC Water Miscible Solvent Correction has been applied to Results and MRLs for volatiles soil samples per EPA 8000C.
- Batch
QC Unless specifically requested, this report contains only results for Batch QC derived from client samples included in this report. All analyses were performed with the appropriate Batch QC (including Sample Duplicates, Matrix Spikes and/or Matrix Spike Duplicates) in order to meet or exceed method and regulatory requirements. Any exceptions to this will be qualified in this report. Complete Batch QC results are available upon request. In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) is analyzed to demonstrate accuracy and precision of the extraction and analysis.
- Blank
Policy Apex assesses blank data for potential high bias down to a level equal to 1/2 the method reporting limit (MRL), except for conventional chemistry and HCID analyses which are assessed only to the MRL. Sample results flagged with a B or B-02 qualifier are potentially biased high if they are less than ten times the level found in the blank for inorganic analyses or less than five times the level found in the blank for organic analyses.
- For accurate comparison of volatile results to the level found in the blank; water sample results should be divided by the dilution factor, and soil sample results should be divided by 1/50 of the sample dilution to account for the sample prep factor.
- Results qualified as reported below the MRL may include a potential high bias if associated with a B or B-02 qualified blank. B and B-02 qualifications are not applied to J qualified results reported below the MRL.
- QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- *** Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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Darwin Thomas, Business Development Director

Anderson Geological
PO Box 649
Wilsonville, OR 97070

Project: Northstar
Project Number: 1503.10
Project Manager: Erik Anderson

Reported:
10/13/17 13:54

APEX LABS CHAIN OF CUSTODY Lab # A7I0280 COC 1 of 1

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333
 Company: Anderson Geological Project Mgr: Erik Anderson Project Name: Northstar Project # 1503.10
 Address: _____ Phone: _____ Fax: _____ Email: _____
 Sampled by: E. Anderson
 Site Location: OR WA Other: _____
 SAMPLE ID: _____
 LAB ID # _____ DATE _____ TIME _____ # OF CONTAINERS _____
 MATRIX _____
 NWTH-HCID _____
 NWTH-Ds _____
 NWTH-Gs _____
 8260 VOCS Full Lab _____
 8260 RBM1 VOCS _____
 8260 BVOCs _____
 8260 RTEX VOCS _____
 8270 SVOC _____
 8270 SIM PAHs _____
 8082 PCBs _____
 600 TTO _____
 RCRA Metals (8) _____
 TCLP Metals (8) _____
 AL, SR, AN, BA, BE, CA, CD, CR, CU, FE, NI, PB, SE, SG, NA, TL, V, ZN
 TOTAL DISS TCFP _____
 1200-COILS _____
 1200-Z _____
Sp4873-Relin

Normal Turn Around Time (TAT) = 10 Business Days YES NO

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DYS Other: _____

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: E.A. Date: 9-14-17 Signature: [Signature] Date: 9-14-17
 RECEIVED BY: _____ Signature: _____ Date: _____
 Printed Name: Erik Anderson Time: 9:04 Printed Name: R. Kemmerer Time: 9:04
 Company: AGI Company: APEX

Apex Laboratories

[Signature]

Darwin Thomas, Business Development Director

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Anderson Geological
 PO Box 649
 Wilsonville, OR 97070

Project: Northstar
 Project Number: 1503.10
 Project Manager: Erik Anderson

Reported:
 10/13/17 13:54

APEX LABS COOLER RECEIPT FORM

Client: Anderson Geological Element WO#: A7 T0280
 Project/Project #: Northstar / 1503.10

Delivery info:

Date/Time Received: 9/12/17 @ 904 By: RK
 Delivered by: Apex Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Inspected by: (RK) : 9/12/17 @ 930

Chain of Custody Included? Yes No Custody Seals? Yes No
 Signed/Dated by Client? Yes No
 Signed/Dated by Apex? Yes No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	<u>11</u>						
Received on Ice? (Y/N)	<u>(Y)</u>						
Temp. Blanks? (Y/N)							
Ice Type: (Gel/Real/Other)	<u>(Gel)</u>						
Condition:	<u>good</u>						
Cooler out of temp? (Y/N)	<u>(N)</u>						
Possible reason why:							
If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA							
Samples Inspection: Inspected by: <u>(RK)</u> : <u>9/12/17 @ 1130</u>							
All Samples Intact? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comments: _____							
Bottle Labels/COCs agree? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comments: <u>NOT on containers</u>							
Containers/Volumes Received Appropriate for Analysis? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comments: _____							
Do VOA Vials have Visible Headspace? Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>							
Comments: _____							
Water Samples: pH Checked and Appropriate (except VOAs): Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>							
Comments: _____							
Additional Information: _____							
Labeled by: <u>(DK)</u> Witness: <u>(AKC)</u> Cooler Inspected by: <u>(RK)</u> See Project Contact Form: Y							

Darwin Thomas