



Alaska Department of Environmental Conservation

Reuse & Redevelopment Initiative

Brownfield Assessment



PROPERTY ASSESSMENT
AND CLEANUP PLAN
FORMER HEADSTART BUILDING
RUBY, ALASKA

Ahtna
Engineering Services, LLC

Submitted to:
Department of Environmental Conservation
Reuse and Redevelopment Program

By:
Ahtna Engineering Services, LLC
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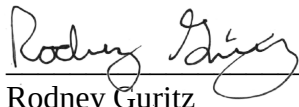
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APPROVAL PAGE

This property assessment and cleanup plan for the Former Headstart Building site in Ruby, Alaska has been prepared for the Alaska Department of Environmental Conservation by Ahtna Engineering Services, LLC, with support from their teaming partners Arctic Data Services, LLC and Geosyntec Consultants, Inc.

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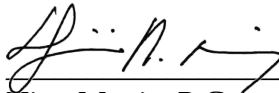
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ACRONYMS AND ABBREVIATIONS

ACM	Asbestos Containing Material
ADCCED	Alaska Department of Commerce, Community, and Economic Development
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
ADS	Arctic Data Services, LLC
Ahtna	Ahtna Engineering Services, LLC
ANCSA	Alaska Native Claims Settlement Act
AST	Above-ground Storage Tank
bgs	below the ground surface
BLM	US Bureau of Land Management
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
City	City of Ruby
CSM	Conceptual Site Model
cy	cubic yards
DBAC	ADEC Brownfields Assessment or Cleanup Grant
DCRA	Division of Community and Regional Affairs
DQA	Data Quality Assessment
DRO	Diesel Range Organics
E&E	Ecology & Environment, Inc.
EPA	US Environmental Protection Agency
GRO	Gasoline Range Organics
HBM	Hazardous Building Material
HUD	US Department of Housing and Urban Development
IGAP	Indian General Assistance Program
L	liter
mg/cm ²	milligrams per square centimeter
mg/kg	milligrams per kilogram
mL	milliliter
NORTECH	NORTECH Sustainable Environment, Energy, Health & Safety, Inc.
NTP	Notice to Proceed
PACP	Property Assessment and Cleanup Plan
PAH	Polycyclic Aromatic Hydrocarbon
ppm	parts per million
PID	Photoionization Detector
RTC	Ruby Tribal Council
TCC	Tanana Chiefs Conference
USDA	US Department of Agriculture
UST	Underground Storage Tank
VOC	Volatile Organic Compound
XRF	X-Ray Fluorescence
YKSD	Yukon Koyukuk School District
YRITWC	Yukon River Intertribal Watershed Council
µg/kg	micrograms per kilogram

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EXECUTIVE SUMMARY

On behalf of the Alaska Department of Environmental Conservation (ADEC), Ahtna Engineering Services, LLC (Ahtna) and its teaming partners performed file review, interviews, site reconnaissance, and a site investigation in preparation of this property assessment and cleanup plan (PACP) for the Former Headstart Building and property in Ruby, Alaska. The work was funded by the US Environmental Protection Agency (EPA) Brownfields Program based on a request from the Alaska Department of Natural Resources (ADNR) and the Ruby Tribal Council (RTC) to the ADEC for brownfield assessment and cleanup. The community intends to redevelop the site as a community gathering space.

Use of the property for a school site dates back prior to 1963, potentially as far back as 1917 during territorial days. The current building on the site was constructed in 1963 as an addition to an existing school building. According to local interviews, the State of Alaska operated the school in 1963 and constructed the buildings on the site. Review of title records on file with the ADNR indicated that the US Bureau of Land Management (BLM) conveyed the land and the buildings to the State of Alaska in 1976. The property was subsequently leased to the City of Ruby (City) from 1981 to 2006. In the 1980s the original school building and outbuildings were demolished or moved off site, leaving the current structure. For most of the 25-year lease period, the current building was used by the Tanana Chiefs Conference (TCC) Headstart program as a preschool. During much of the site's early history, potentially continuing during the City's lease, fuel oil was stored in an underground storage tank (UST) supplying the school's furnace and two above-ground storage tanks (ASTs) supplying the former on-site generator. According to local residents, the UST and AST were filled from 55-gallon drums delivered to the site from summer barges.

A hazardous building material (HBM) survey was conducted in August 2015 that identified numerous building materials containing asbestos above the regulatory threshold of one percent. Identified asbestos-containing material (ACM) was non-friable, meaning in its current condition, it is not releasing asbestos fibers and thus not presenting an exposure risk. However, the building interior, including much of the ACM, is in deteriorating condition. Any future building renovation or demolition work must include safe practices to abate or manage the ACM to prevent exposure.

A site investigation was conducted in September 2015 that included field-screening and sampling two test pits (one in each potential source area), 16 hand-augered soil borings, and 11 shallow hand-dug test pits in the building crawlspace. Petroleum contaminants were detected above ADEC cleanup levels in both source areas. Contaminated soil was present at higher concentrations and extended beneath the building in the vicinity of the UST. Air sampling conducted in March 2016 identified trace levels of fuel-related contaminants in building air, though results suggested vapor intrusion from soil contamination was not occurring (rather vapors were from an indoor source).

A cleanup plan was developed that recommends removal of a majority of contaminated soil from both source areas, treatment of contaminated soil via rhizoremediation, and mitigation of exposure to remaining contamination through crawlspace ventilation and a year of air monitoring to confirm mitigation. A general cost estimate to execute the cleanup plan was developed based on these recommendations. Implementing these actions should reduce or control exposure to contamination at the site, allowing for safe reuse of the property as a future community gathering space.

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1.0 INTRODUCTION

On January 30, 2015, the Ruby Tribal Council (RTC) and the Alaska Department of Natural Resources (ADNR) submitted an ADEC Brownfields Assessment or Cleanup (DBAC) request (Appendix A) to the Alaska Department of Environmental Conservation (ADEC). In the request, they detailed concerns regarding potential contamination at the Former Headstart Building and associated property in Ruby, Alaska. According to the request, the community was concerned that vapors may be entering the building from nearby soil contamination or originating from indoor sources (a reported fuel-line leak), and that contamination from the property may have migrated offsite or into groundwater. The request was prepared following a site visit in 2013 by ADNR, and supported in a resolution by the RTC and a letter from the mayor of the City. During ADNR's site visit, a UST was identified on the site (based on discovery of a fill/vent pipe near the building) and a "chemical" odor was detected in the crawlspace of the building. The community wishes to renovate or replace the building and use the site as a community gathering space. The property is centrally located in Ruby, overlooking the Yukon River.

1.1 Purpose

Under notice to proceed (NTP) #18-8036-01-014, ADEC tasked Ahtna Engineering Services, LLC (Ahtna) to prepare a Property Assessment and Cleanup Plan (PACP) for the Former Headstart Building site in Ruby, Alaska. Rodney Guritz of Ahtna teaming partner Arctic Data Services, LLC (ADS) led the historical research, field investigation, and PACP preparation under the direction of the Ahtna project manager, Andrew Weller. Additional assistance was provided by teaming partner Geosyntec Consultants, Inc.

The NTP was modified (#18-8036-01-014B) on January 13, 2016 to include limited air sampling. This PACP report summarizes our background research, methodology, and findings, and provides recommendations for remediation and mitigation of contamination identified at the site and building.

1.2 Objectives

Our primary objectives were to identify whether contamination exists at the site at levels presenting a risk to human health or the environment; determine the implications of potential contamination on reuse of the property; and develop a plan to remediate potential contamination or mitigate exposure pathways to allow for reuse of the property.

1.3 Scope of Work

Our scope of work to meet the project objectives included the following elements:

- Collecting historical information about the building, property use, and potential sources of contamination through a combination of records review, site reconnaissance, and interviews;

- Conducting a hazardous building material (HBM) survey to determine whether the building contains lead-based paint, asbestos, fuel-contaminated materials, or other hazardous materials;
- Developing and implementing a work plan to characterize the nature and extent of soil contamination on the property by collecting soil samples from potentially contaminated locations on the property identified during background research, including beneath the building and near the down-gradient property boundary, and evaluate and potentially mitigate exposure to site contaminants in indoor air; and
- Preparing this PACP report, including recommendations for site remediation and/or mitigation of exposure.

2.0 COMMUNITY OVERVIEW

Ruby is an Alaska Native village on the Yukon River in interior Alaska (Figure 1, attached). Its population of approximately 166 people are predominantly Koyukon Athabascan, though the town was permanently settled in the early 1910s by miners following gold strikes on nearby creeks. Ruby's early history includes the boom and bust of gold mining developments, but is predominantly characterized by the traditions and subsistence lifeways of its current residents. The following sections summarize information about the community with regards to this project.

2.1 Location, Climate, and Geologic Setting

Ruby is located on the south bank of the Yukon River, about 230 miles west of Fairbanks and 50 miles east of Galena. The town is situated on a relatively steep, northwest-facing slope in the Kilbuk-Kuskokwim Mountains. Ruby is adjacent to the Nowitna National Wildlife Refuge.

Climate in interior Alaska is generally cold and dry, and is characterized by extreme seasonal temperature differences. According to the Alaska Climate Research Center, mean temperature in nearby Galena ranges from -9.2 °F in January to 60.6 °F in July and mean annual precipitation is 12.37 inches (University of Alaska Fairbanks, 2010). Sustained temperatures below -30 °F are common in winter. Being situated on a steep northwest-facing slope, many parts of Ruby receive less light resulting in colder temperatures and a slower spring thaw than surrounding areas. According to City clerk Jennie Peter (personal communication, September 2016), some low areas in Ruby are heavily impacted by aufeis each year.

Ecology and Environment, Inc. (E&E) presented a thorough discussion of geological and hydrological conditions in a 1999 report on the Ruby Radio Station site. According to E&E, bedrock in the Ruby area is mapped as a metamorphic rock complex of late Devonian to late Triassic age, overlaid by Quaternary-age alluvium. Two aquifers have been identified in Ruby; one shallow aquifer in interbedded sandy silt and gravelly sand at approximately 12 feet below the ground surface (bgs), and a deeper aquifer in fractured limestone between approximately 45 and 185 feet bgs. The deeper aquifer is separated from the shallow aquifer by a less conductive bedrock layer estimated at 27 feet thick; whether this acts as a confining layer is unknown. The public water-supply well and private drinking-water wells are installed in the deeper aquifer (Ecology and Environment Inc., 1999). Water-well logs discovered in the course of this project substantiate this information.

2.2 Culture

Most of Ruby's residents are Koyukon Athabascan. Athabascans are a large and diverse group of Indigenous peoples whose ancestral lands span the North American subarctic. Athabascan is actually a Cree word; the term Dene is preferred by some Athabascans, as it has origins in their own languages. There are 11 different Athabascan languages in Alaska alone. The Koyukon, or Hut'aane, people speak Denaakk'e.

Koyukon culture revolves around the subsistence lifeway practiced for millennia in northern regions such as interior Alaska. Given the importance of hunting, fishing, and gathering, and the

seasonal and geographic variability in subsistence resources, Koyukon peoples were original nomadic, living in small bands. At certain times of the year, these bands would congregate into larger units for trade, ceremony, and socialization. The potlach is a prominent tradition that is emblematic of Koyukon culture. The potlach is a gathering typically held to honor the deceased, in which people travel from all over to share and give away food and gifts in deep spirit of sharing. Koyukon culture has been subject to dramatic change in the past century, following settlement in villages and regional hubs, the epidemics of the late 1800s and early 1900s, Western assimilatory practices such as compulsory education (boarding schools), language suppression, and other colonial influences. However, not all cultural change has been negative, and many cultural elements or practices such as subsistence hunting and fishing, potlaches, intimate knowledge of and respect for animals, respect for elders, and sharing are actively maintained in rural communities like Ruby. For a more detailed presentation of Athabascans, see Athabascans of Interior Alaska (Alaska Native Knowledge Network, 2016).

2.3 History

The following summary of Ruby's history is presented by Tanana Chiefs Conference (TCC) on their website (Tanana Chiefs Conference, 2016):

Ruby's current residents are Koyukon Athabascans of the Nowitna-Koyukuk band, a nomadic group who followed game with the changing seasons. There were 12 summer fish camps located on the Yukon River between the Koyukuk River and the Nowitna River. Ruby developed as a supply point for gold prospectors. It was named after the red-colored stones found on the riverbank that prospectors thought were rubies. Two gold strikes, one at Ruby Creek in 1907 and another at Long Creek in 1911, attracted hundreds of prospectors to the area.

At one time, over 1,000 white miners lived in Ruby and the nearby creeks. Placerville, Poorman, Sulatna Crossing, Kokrines, and Long Creek were some of the area's boom settlements. A post office was established in 1912, and Ruby incorporated as a city in 1913. Initially, the city was governed by miners' meetings, then later by Pioneer Igloo Number 5. After the gold rush, the population declined rapidly.

By 1939, there were only 139 residents. During World War II, the mining operations were shut down, and most of the white residents left. After the war, the remaining residents of nearby Kokrines relocated to Ruby, and the population began to increase. Ruby incorporated as a second-class city in 1973. A clinic, a watering point, and schools were constructed in the 1970s. During the 1980s, telephones and television services were provided.

2.4 Demographics

According to the Alaska Department of Commerce, Community, and Economic Development's (ADCCED) Division of Community and Regional Affairs (DCRA), 89 percent of Ruby's residents are Alaska Native. Of the 2010 census population of 166, 59 were age 19 or younger, 91 were age

20 to 64, and 16 were age 65 and older; the median age was 38 (2016). Historic census data shows Ruby's population hovering between 150 and 200 people from 1960 to 2010. Housing characteristics show 108 total housing units, of which 62 are occupied year-round. A majority of housing is owner-occupied. The average household size is 3 people. Median household income was estimated at \$24,464; however, it is important to note that this number likely does not account for the substantial value of subsistence resources vital to the well-being of most Ruby households.

2.5 Resources and Infrastructure

This section provides a broad overview of major resources and public infrastructure in Ruby. Section 6.4 provides a more detailed discussion of specific resources that could be utilized during site cleanup.

The City operates the public water supply and washeteria, which is supplied by a groundwater well. However, most residential housing units do not have piped water or sewer. Instead, some individuals have drilled drinking-water wells and private septic systems, while others haul water from the public water source and use the washeteria for bathing and clothes washing.

A local contractor, Kangas Construction, drills drinking water wells and installs septic systems. Kangas Construction, the City, and the RTC each have their own fleet of heavy equipment and qualified operators.

Electricity is supplied by the City from a diesel power plant. Most houses have electricity, provided from overhead lines. Phone and internet are provided by United Utilities, GCI, and various satellite internet providers. Transportation and shipping to and from Ruby is largely by aircraft and barge, though private watercraft and snowmachines are utilized in the winter for visiting nearby communities (namely Galena and Tanana). The community has a health clinic with care provided by a local health aide. There is an area search and rescue organization, in partnership with Galena residents.

Ruby's landfill is a Class III municipal landfill, located 1.5 miles southwest of the community. The landfill is operated by the City of Ruby, and the RTC's EPA Indian General Assistance Program (IGAP) provides operational assistance, manages hazardous waste, and maintains a backhaul program. The landfill consists of a single active disposal cell and a salvage area. The landfill is not permitted to accept asbestos-containing waste.

A majority of land in the immediate vicinity of Ruby is owned by the Alaska Native Claims Settlement Act (ANCSA) village corporation, the Dineega Corporation, and the ANCSA regional corporation, Doyon Ltd. (Appendix B). There are also a number of individual Alaska Native allotments in the area.

2.6 Community Involvement

Throughout this project, we have maintained active communication with various community entities, and have held several meetings with and in the community to solicit ideas and information and communicate progress. In preparing this PACP, we have consulted with numerous community

members for detailed information regarding the site and its history. We interviewed Billy McCarty, a knowledgeable elder who helped build the Former Headstart Building in 1963. This interview was instrumental in establishing a historic property-use timeline and identifying potential contamination sources and building characteristics. The RTC's IGAP coordinator, Shaelene Nickoli, helped with project coordination throughout the field effort, and has graciously offered to review the draft PAPC report from a community perspective.

2.6.1 Stakeholder Meetings

On July 30, 2015, shortly after receiving the NTP, we held an initial kickoff meeting by phone, inviting key stakeholder representatives from the City and the RTC and extending the invitation to all interested Tribal Council or City Council members. The meeting was attended by the ADEC project manager, Robert Burgess; ADNR representative, Patty Burns; AES project manager, Andrew Weller; ADS project scientist, Rodney Guritz; and City clerk, Jennie Peter. The goal of this meeting was to ensure all stakeholders were in agreement with the general project approach, and to check that the project approach addressed the redevelopment needs of the community. The project schedule and opportunities for local project support were also discussed.

Given the relatively low community representation at this meeting, and the general inadequacy of phone-based meetings to engage local community members and stakeholders, we opted to meet with the RTC at one of their scheduled monthly meetings during our first site visit, to provide them with an update on our plans and seek community input on our approach. This meeting was far more productive for engaging community members with knowledge on the site. We obtained additional information about the site, and received the support of the RTC for proceeding as planned.

On December 11, 2015, following our site assessment and receipt of analytical results, we attended a meeting coordinated between Patty Burns (ADNR) and the community. This was an open meeting with attendance from various Tribal Council members, the City vice-mayor, and several interested community members including at least one person affiliated with the Dineega Corporation. At this meeting, we presented preliminary results from our site assessment and HBM survey, and ADNR discussed options for eventual conveyance of the property to the community. There were questions raised by community members about asbestos mitigation and abatement in the context of possible building renovation or demolition, options for site cleanup and various property transfer scenarios, and the possibility of finding and rehabilitating the on-site drinking water well for use (and concerns raised over potential groundwater contamination).

2.6.2 Proposed Community Development and Property Reuse

The community has expressed a desire to reuse the property as a community gathering space. The RTC has discussed the possibility of renovating and reusing the building; alternately, the RTC has discussed demolishing the building and constructing a new building in its place. The site is an ideal gathering place due to its central location, large gravel pad, and spectacular view of the Yukon River. The building itself is structurally sound and spacious, though HBM may complicate its reuse (Section 4.2). According to community members, there was a drinking-water well at the site; community members expressed interest in finding and rehabilitating the well for use.

Both the City and the RTC have expressed interest and a shared vision for property reuse as a community gathering space. No funding sources have yet been identified for building renovation or demolition (and subsequent construction of a new building), though the RTC has discussed pursuing a legislative appropriation and has applied in 2016 for another round of DBAC funds to address the soil contamination identified in the course of our investigation.

2.6.3 Interviews

Mr. Guritz interviewed elder and tribal-council member Billy McCarty on August 11, 2015. Mr. McCarty helped construct the building in 1963, and maintained the original school building that had been located on the same property. The interview was audio recorded and transcribed for later review. Mr. McCarty noted a number of historic facts that are relevant to this assessment:

- The current building was constructed in 1963 as an addition to the original school building.
- A wooden septic system was installed to the west of the building, downhill near the current community hall.
- The school was always a state school, and was not affiliated with the BIA at any point.
- The former generator building was moved off-site (across street to the south) and repurposed as a cabin.
- When the old school building was demolished, local residents salvaged building materials from it.
- The other outbuildings were outhouses.
- The old well had problems and has not been used for a long time.
- Mr. McCarty had no knowledge of fuel odors in the building.
- An even older school, the territorial school (constructed in 1917, added onto in 1934) existed in Ruby, but it burnt down. It may have been located on a different, nearby property.

Also, during our first site visit, we conducted brief, informal interviews with other local residents with knowledge about the site. Don Honea Jr., current Tribal Council member, informed us that drums were stored to the northwest of the school along the access road, and were used to fill the above-ground storage tanks (ASTs) supplying the generator building. This was the sole means of delivering fuel at that time.

Ivan Kangas, long-time operator of the tank farm and fueling station in Ruby, recalls delivering fuel only to the current above-ground heating oil tank. It is unclear when the UST stopped being used, but was likely at least 20 years ago.

James Williams indicated he had been involved with school maintenance when the property housed the state-run school. He used to run the generators and fill the ASTs from drums, which were stored on the site to the northwest of the current building (along the access road). He recalled several small spills while filling the ASTs. He also indicated the on-site well was installed to a depth of 150 to 200 feet bgs, and that the UST has a capacity of 500 gallons.

Additional information about the site and the community in general was obtained from the tribe's IGAP coordinator, Shaelene Nickoli, whose assistance was invaluable in conducting our investigation and preparing this PACP.

3.0 PROPERTY OVERVIEW

The subject property is located near the center of Ruby, between Good Time Road and Airport Road, about 700 feet south of the south bank of the Yukon River (Figure 2, attached). The legal description is Lot 3, Block 4, Tract A, US Survey 5088, Section 4, Township 9S, Range 17E. The size of the lot, according to US Survey 5088 (Appendix C, Figure 3), is 31,932 square feet.

The Former Headstart Building is located close to the northwest property boundary. The site slopes southwest, with a leveled gravel pad at the northeast end of the property where the former generator building and outhouses stood, and a large cleared and graded area to the southeast of the building where outside gatherings have taken place. There is a pole-frame structure to the southeast of the building (Figure 4, image left), and two outhouses immediately northeast. Two tanks currently exist on the property; an abandoned heating-oil UST along the northwest side of the building (see Section 4.1) that supplied the forced air furnaces in the building, and a modern heating-oil AST along the southwest side of the building that supplies the monitor heater in the main room of the building.

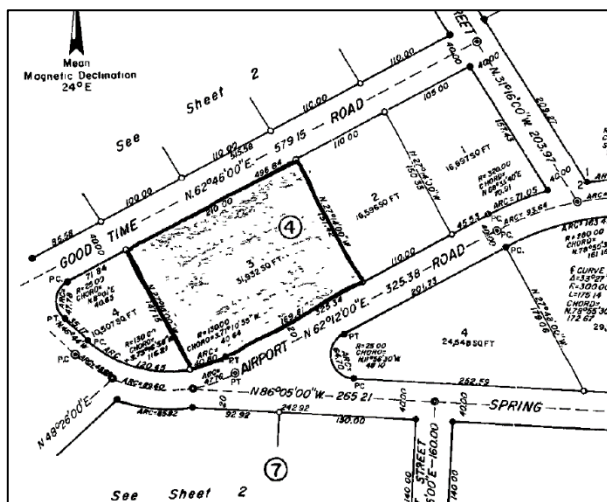


FIGURE 3 – LOT 3, BLOCK 4, TRACT A, USS 5088



FIGURE 4 – SUBJECT PROPERTY, LOOKING WEST

3.1 Subsurface Conditions

Surface soil at the site consists of a thin (1-2 foot) layer of gravel fill, reportedly placed over the site in 2011. Below this fill layer is the original ground surface. This layer consisted of 2-3 feet of mottled grey-brown silt with substantial organic content based on our test pits (see Section 4.3). Below this is a uniform layer of clayey brown silt to at least 10 feet below the ground surface (bgs). Groundwater is deep in the vicinity; a well log for a nearby well reports groundwater at 110 feet bgs. A well log for an irrigation well installed for the Yukon Koyukuk School District (YKSD), presumably for the new school up near the airport, indicates a water-bearing fractured bedrock from 186 feet to 208 feet bgs. Well logs were obtained from the ADNRC well log tracking system and are included in Appendix C.

3.2 Historic Property Use

The property is roughly in the center of town, and historic photos (Appendix C) show development of the site vicinity as early as 1911 during the gold rush. One photograph shows the first territorial school in Ruby being dedicated in 1917; another shows an addition to this school including teacher housing under construction in 1934 (University of Alaska Fairbanks, 2016). However, according to Billy McCarty, this school building may have been located on a different property and burnt down prior to the construction of the original school building on the subject property (below).

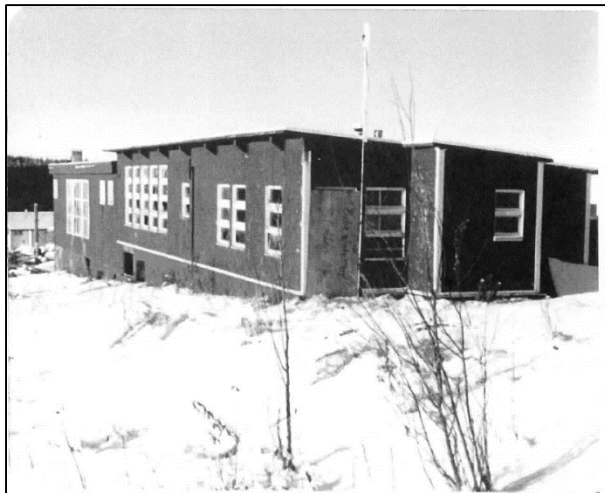


FIGURE 5 – ORIGINAL SCHOOL BUILDING

The subject property was presumably developed as a school site between 1934 and 1963, when the original school building (Figure 5) and supporting outbuildings were constructed. No aerial photographs were available dating before 1963 (the date of construction of the current building; Figure 6), and our limited interviews did not yield a date of construction for the original school. The site was operated as a state school until the new Yukon

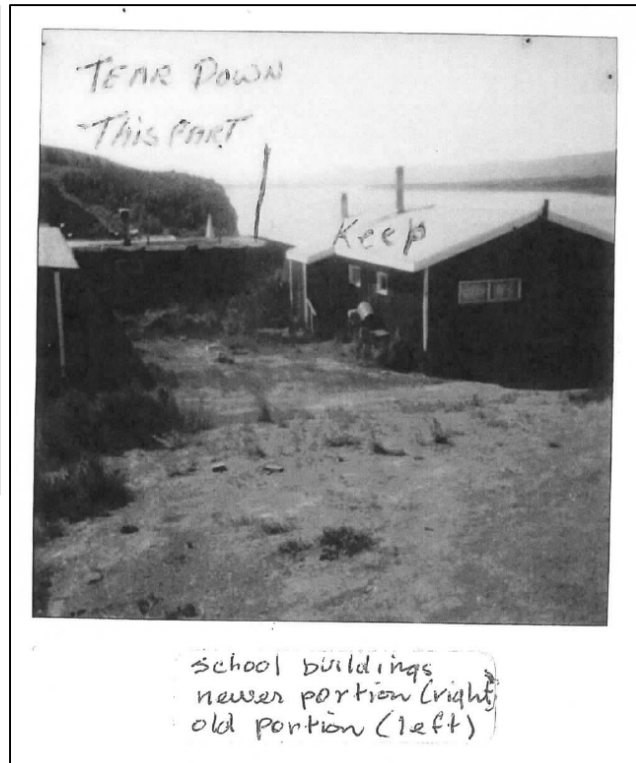


FIGURE 6 - CURRENT BUILDING (RIGHT), ALSO SHOWING CORRIDOR TO OLD BUILDING (LEFT).

Koyukuk School District (YKSD) school (uphill from town, near the airport) was constructed in the late 1970s. The current building was constructed in 1963, as an addition to the original school building.

The property and building were leased to the City from 1981 to 2006 (see Section 3.4.2). The original school building and the outbuildings on the property (including the generator building) were demolished or moved off-site in the early 1980s; records show the City of Ruby notified ADNR of their intent to demolish the buildings in 1982, though the precise year of demolition is unknown. The generator building (Figure 7) was moved off-site and repurposed as a cabin on an adjoining property (see also Section 3.5 and Figure 8).



**FIGURE 7 – FORMER GENERATOR BUILDING, SHOWING
FORMER ASTS**

The current building began housing the TCC Headstart preschool program around 1989. The building was used for Headstart from 1989 until 2006, when the City's lease expired. It is unknown what the City used the building for from 1981 to 1989. It is also unclear to what extent the property and building have been used following expiration of the lease in 2006. Local residents indicated that the building was used several times as a community gathering place, such as during the 2011 Yukon River Intertribal Watershed Council (YRITWC) Summit and the 2013 Galena flood relief. The property has been a central staging area for the Iditarod checkpoint for many years, including during our March 2016 air sampling event (though the building itself was not used).

3.3 Ownership Information

Land ownership records on file with the ADNR were reviewed for the subject property. Pertinent documents are included in Appendix C. The following is a summary of land-ownership chronology based on title information from ADNR.

- Patent 50-76-0151 was issued by the US Bureau of Land Management (BLM) on April 2, 1976 for land and restricted mineral estates for Tract A (includes subject property), USS 5088 to George E.M. Gustafson, Trustee, with several rights-of-way and placer mineral deposits excepted.
- A trustee deed was issued on October 5, 1976 to the State of Alaska for the land and partial mineral estates for Lot 3, Block 4, Tract A, USS 5088 (subject property) from George E.M. Gustafson, Trustee for the townsite of Ruby. This deed included all appurtenances (buildings).
- The land was leased from the ADNR to the City of Ruby from December 31, 1981 to December 30, 2006 under ADL 403954.

3.4 Records Review

State records reviewed for the site included the ADEC contaminated sites database and files, and ADNR lease file ADL 403954 and lease renewal application file ADL 419217. The City and the RTC did not have any files on the subject property. No federal records were reviewed.

3.4.1 ADEC Contaminated Site File and Database

Other than the subject property, only two contaminated sites are listed in the ADEC contaminated sites database for the Ruby area, both listed with cleanup complete status. One is the Melozi Hot Springs site, approximately 35 miles northeast of Ruby; the other is the City of Ruby Teen Center, the site of a small fuel line leak into a building crawlspace. Neither is expected to impact environmental conditions at the subject property.

There is very limited information in the ADEC contaminated site file for the subject property (file number 870.38.004). Prior site visits were limited to the ADNR's property inspection in 2013, where "chemical" odors were detected in the building crawlspace and the UST stickup identified. The site was added to the ADEC contaminated sites database following ADNR's spill report in 2013. Our site investigation in 2015 was the first time any samples were collected at the property.

3.4.2 ADNR Lease ADL 403954

The ADNR leased the property and building to the City of Ruby from December 31, 1981 to December 30, 2006 under lease agreement ADL 403954. Under this lease, the City of Ruby in turn allowed TCC to operate the Headstart preschool program out of the building. The lease agreement is included in Appendix C. Also under this lease, the old school building was demolished and outbuildings demolished or removed.

3.4.3 ADNR Lease Application ADL 419247

This lease application file primarily contained correspondence between the ADNR and the City of Ruby pertaining to a 2011 lease application submitted by the City of Ruby. The lease application was originally submitted without a development plan, and was thus deemed incomplete. It appears there was some unauthorized use of the property and building around this time, and the lease application stalled until the time of ADNR's site visit in 2013. During this site visit (Section 5.1, spill report in Appendix A) potential contamination was identified on the property. ADNR closed the lease application file in 2015 and will not consider authorizing site use until ADEC deems that the site is safe to use.

3.5 Adjoining Property Use

Immediately southwest and downhill of the property is the Ruby Bible Church. West and downhill of the property is the community hall, a small log building owned by the City. To the northeast (uphill) of the property are private residences, and to the southeast (downhill) of the property are private residences, including the repurposed former generator building moved from the subject property (Figure 8).



FIGURE 8 – FORMER GENERATOR BUILDING, REPURPOSED AS CABIN ON ADJOINING PROPERTY

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4.0 SITE INVESTIGATION

Ahtna conducted a site investigation over several visits to Ruby from August 2015 to March 2016. The major elements of site work included site reconnaissance and a HBM survey, soil sampling, and air sampling, described in the following sections below. Refer to the project work plan (Ahtna Engineering Services LLC, 2015) for additional details regarding sampling methodology.

4.1 Observations

The site was sparsely vegetated, with the ground surface primarily comprised of a brown sandy gravel (fill). The site slopes to the southwest, with a level area near the location of the former outbuildings. A wooden tent-frame structure sits approximately where the old school building stood. Immediately adjacent the southeast side of the building sits a 300-gallon heating-oil AST (supplying the Monitor stove); to the northwest is a bent-over UST fill/vent pipe. We were unable to probe the UST due to the condition of the fill/vent pipe, but we were able to detect fuel vapors in the pipe with a photoionization detector (PID) by drilling a hole in it for field screening (Figure 9).

During our initial site reconnaissance, we identified no fuel vapors in the crawlspace or building, other than in an isolated corner of the furnace room (see HBM Survey, Appendix D). PID readings throughout the crawlspace were less than 1 parts per million (ppm). There was no surface staining or other indication of surface-soil contamination.



FIGURE 9 – UST FILL/VENT PIPE

4.2 Hazardous Building Material Survey

On August 11, 2015, Mr. Guritz and Doug Dusek of Ahtna subcontractor NORTECH Sustainable Environment, Energy, Health & Safety, Inc. (NORTECH) conducted a HBM survey of the building. This included collecting numerous building-material samples for analysis of asbestos. Paint was field-screened using an x-ray fluorescence (XRF) detector, and two paint samples were collected for laboratory analysis of lead. Other potential building hazards, such as light ballasts and mercury-containing fluorescent bulbs, were documented. Mr. Guritz and Mr. Dusek also conducted limited field screening for petroleum hydrocarbons in the floor of the furnace room using a PID. The HBM Survey prepared by NORTECH is included in Appendix D. Findings of the survey are summarized in Section 4.5.1 below.

4.3 Soil Field Screening and Sampling

During a second visit on September 28-30, 2015, Mr. Guritz collected soil samples to characterize the degree and extent of contaminated soil associated with the heating-oil UST and former ASTs. The former AST locations were identified based on a scale pre-demolition sketch of the site in the ADNR lease file (Appendix C), corroborated by interviews and historic site photos. Note that the former ASTs are distinct from the current AST present adjacent to the southwest side of the building (currently supplying the Monitor stove). Test pits were excavated with assistance from the City using a track-mounted backhoe to



FIGURE 10 – TEST PIT IN FORMER AST AREA

approximately 10 feet bgs in each suspected source area, to delineate the vertical extent of contamination (Figure 10). Horizontal delineation was accomplished by advancing a series of hand-augured soil borings to 4 feet bgs in each area (Figure 11). Test pits and soil borings were field-screened prior to sampling using a PID. A total of two test pits were excavated, field screened, and sampled for analysis of diesel range organics (DRO), gasoline range organics (GRO), benzene, toluene, ethylbenzene, and xylenes (BTEX), and (select samples only) polycyclic aromatic hydrocarbons (PAHs). A total of 17 soil borings were advanced and field screened; of these, 10 were sampled. Additionally, 11 shallow hand-dug test pits in the building crawlspace were field-screened, and 5 locations sampled for DRO, GRO, and volatile organic compounds (VOCs). Soil sampling locations are shown on Figure 2 (attached). Results are summarized in Section 4.6.2 below.



FIGURE 11 – HAND AUGURING SOIL BORINGS NEAR UST

ADEC project manager and ADNR property manager, with the intent of mitigating any potential vapors arising from the UST-associated soil contamination. This passive ventilation should also help in ameliorating the apparent mold problem in the crawlspace.

4.4 Crawlspace Vapor Mitigation

During the September site visit, crawlspace vents were installed on the skirting around the southwest half of the building. This mitigation effort was conducted with the approval of the

4.5 Air Sampling

In March 2016, Ahtna returned to the site to conduct an air quality assessment of the former Headstart building. This work was authorized as a revision to our original scope of services (see Section 1.3). The goal was to evaluate both the potential for vapor intrusion, as well as the impacts to indoor air quality from old fuel-impacted flooring in the furnace room (or other indoor background sources, such as disconnected fuel piping at the furnaces).

Air samples were collected from five locations: the furnace room, the main hall, the southwest portion of the crawlspace, the northeast portion of the crawlspace, and outdoor air (on the front steps of the building). We utilized graduated 60-milliliter (mL) syringes to draw one liter (L) of air through carbon sorbent tubes in five separate aliquots spaced over a 24-hour period, for a total sample volume of 5.0 L. Clean Teflon tubing was used as an extension of the sampler to collect crawlspace samples. The sample tubes were capped, placed on gel ice, and shipped to Air Toxics in Folsom, CA for VOC analysis by EPA Method TO-17.

4.6 Analytical Results and Discussion

The following sections summarize and discuss analytical results. For complete results and detailed data-quality information, refer to Appendix D (HBM Survey and building material sample results) and Appendix E (soil and air sample analytical results).

4.6.1 HBM Survey Findings

Asbestos was detected in 7 of the 14 building materials sampled, ranging from 0.5% to 25% asbestos. Asbestos content was above 1% for 6 materials, including sheetrock joint compound (furnace room), vinyl asbestos tile, and tile mastic. The asbestos-containing materials identified are considered non-friable, and thus do not pose a current exposure risk. They do pose a potential future exposure risk in the event they are disturbed (made friable by sanding, grinding, demolition, etc.), and must be managed accordingly in any future renovation or demolition work to the building. XRF field screening indicated no significant lead content in building paint; this was confirmed by the results of the two paint samples submitted for laboratory analysis, which were below the 1 mg/cm² US Department of Housing and Urban Development (HUD) standard. PID field screening of the floor indicated a small (approximately 30 square feet) area affected by heating-oil contamination. PID readings were highest (up to 108 ppm) at the bottom of the insulation layer below the subfloor.

4.6.2 Soil Sample Results

Soil sample locations are shown on Figure 2 (attached). Complete analytical results are tabulated in Appendix E, along with a data-quality assessment, ADEC data review checklist, and the SGS laboratory report. Results of detected analytes for samples from test pits and borings in the two source areas are summarized in Table 1 (UST area) and Table 2 (fLormer AST area), below.

4.6.2.1 UST Area Results

Soil-sample results for detected analytes from the UST area are presented in Table 1 (below). TP-02 and SB-10 were closest to the UST stickup; samples from these locations are considered representative of this source area. Sample 15-RBY-TP-02-9.5, collected from 9.5 feet in the test pit, defines the vertical extent of contamination. Samples from soil borings SB-12 and SB-14, along with PID field screening results (Figure 2) delineate horizontal extent of contamination (at 4 feet bgs) to the southwest, northwest, and northeast. Samples from SB-16 show that contamination extends beneath the building to the southeast of the UST.

TABLE 1: UST AREA SOIL SAMPLE DETECTED RESULTS

Analysis	Analyte	Units	ADEC Cleanup Level ¹	15-RBY-TP-02-4		15-RBY-TP-12-4		15-RBY-TP-02-9.5	
PID reading (ppm)				497		497		3.7	
AK101	Gasoline Range Organics	mg/kg	250	655	JH	633	JH	1.69	J
AK102	Diesel Range Organics	mg/kg	300	20,600		25,200		40.2	
8021B	Benzene	µg/kg	25	133	U	125	U	7.66	J
8021B	Toluene	µg/kg	6,500	612		506		34.8	UB
8021B	Ethylbenzene	µg/kg	6,900	1,440		1,380		17.4	U
8021B	o-Xylene	µg/kg	63,000 (total xylenes)	35,300		35,000		15.0	J
8021B	P & M -Xylene	µg/kg		24,800		24,300		29.3	J
8270D SIM	1-Methylnaphthalene	µg/kg	6,200	90,400		92,100		NA	
8270D SIM	2-Methylnaphthalene	µg/kg	6,100	95,700		98,800		NA	
8270D SIM	Naphthalene	µg/kg	20,000	32,000		32,600		NA	
8270D SIM	Phenanthrene	µg/kg	3x10 ⁶	872		981		NA	

Analysis	Analyte	Units	ADEC Cleanup Level ¹	15-RBY-SB-10-4		15-RBY-SD-10-4 ²		15-RBY-SB-12-4	
PID reading (ppm)				484		484		2.9	
AK101	Gasoline Range Organics	mg/kg	250	831	JH	596	JH	4.26	UB
AK102	Diesel Range Organics	mg/kg	300	33,600		35,300		26.7	
8021B	Benzene	µg/kg	25	5,800		5,330		10.6	J
8021B	Toluene	µg/kg	6,500	34,500		28,700		65.6	UB
8021B	Ethylbenzene	µg/kg	6,900	16,700		13,300		31.9	J
8021B	o-Xylene	µg/kg	63,000 (total xylenes)	45,800		35,800		56.2	
8021B	P & M -Xylene	µg/kg		70,200		54,200		118	JH

Analysis	Analyte	Units	ADEC Cleanup Level ¹	15-RBY-SB-14-4		15-RBY-SB-16-4		15-RBY-SD-16-4 ³	
PID reading (ppm)				<1		425		425	
AK101	Gasoline Range Organics	mg/kg	250	4.97	UB	363	JH	378	JH
AK102	Diesel Range Organics	mg/kg	300	27.5		12,200		14,500	
8021B	Benzene	µg/kg	25	12.5	U	21.0	J	8.67	J
8021B	Toluene	µg/kg	6,500	24.9	U	128	JH	54.2	UB
8021B	Ethylbenzene	µg/kg	6,900	24.9	U	695		460	
8021B	o-Xylene	µg/kg	63,000 (total xylenes)	24.9	U	13,600		11,300	
8021B	P & M -Xylene	µg/kg		49.7	U	2,640		2,060	

Key:

- 1 18 AAC 75.345 Method 2 Tables B1 and B2 (under-40-inch zone) soil cleanup levels
- 2 15-RBY-SD-10-4 is a field duplicate of 15-RBY-SB-10-4
- 3 15-RBY-SD-16-4 is a field duplicate of 15-RBY-SB-16-4
- mg/kg milligrams per kilogram
- µg/kg micrograms per kilogram
- ppm parts per million
- U analyte not detected; limit of quantitation (LOQ) listed
- J estimated quantity; analyte detected below LOQ
- UB result qualified as not detected due to method-blank contamination
- JH estimated quantity, biased high (due to QC failures)
- bold** result exceeds the cleanup level

The distribution of contamination in the UST area, apparent from field observations and PID field screening, was consistent with a history of surface spills near the UST filler. Soil in this area was a fine brown silt with layers of grey and black organics and fine grey silt. We were unable to determine the exact depth or size of the UST or determine whether it was intact. It is possible the soil samples collected from the base of the test pit do not represent the vertical extent directly below the tank, in the event the tank has leaked.

4.6.2.2 Former AST Area Results

Soil-sample results for detected analytes from the former AST area are presented in Table 2 (below). TP-01 was close to the location of the former ASTs; sample results from this test pit are considered representative of this source area. Sample 15-RBY-TP-01-10, collected from 10 feet in the test pit, defines the vertical extent of contamination. Samples from soil borings SB-01, SB-02, SB-04, SB-06, SB-07, and SB-08, along with PID field screening results from additional borings (Figure 2) delineate horizontal extent of contamination (at 4 feet bgs).

TABLE 2: FORMER AST AREA SOIL SAMPLE DETECTED RESULTS

Analysis	Analyte	Units	ADEC Cleanup Level ¹	15-RBY-TP-01-3		15-RBY-TP-01-10		15-RBY-SB-01-4	
PID reading (ppm)				264		77.8		<1	
AK101	Gasoline Range Organics	mg/kg	250	164	JH	5.46	UB	1.91	U
AK102	Diesel Range Organics	mg/kg	300	3,340		95.5		12.9	J
8021B	Benzene	µg/kg	25	6.86	J	8.80	U	9.50	U
8021B	Toluene	µg/kg	6,500	90.5		17.7	U	38.1	UB
8021B	Ethylbenzene	µg/kg	6,900	321		17.7	U	19.1	U
8021B	o-Xylene	µg/kg	63,000 (total xylenes)	3,610		37.4		17.9	J
8021B	P & M -Xylene	µg/kg		4,570		47.2	J	34.3	J
8270D SIM	1-Methylnaphthalene	µg/kg	6,200	4,130		NA		NA	
8270D SIM	2-Methylnaphthalene	µg/kg	6,100	4,930		NA		NA	
8270D SIM	Naphthalene	µg/kg	20,000	1,840		NA		NA	
8270D SIM	Phenanthrene	µg/kg	3x10 ⁶	446		NA		NA	

Analysis	Analyte	Units	ADEC Cleanup Level ¹	15-RBY-SB-02-4		15-RBY-SB-04-4		15-RBY-SB-06-4	
PID reading (ppm)				<1		2.8		<1	
AK101	Gasoline Range Organics	mg/kg	250	3.16	J	1.77	J	1.45	J
AK102	Diesel Range Organics	mg/kg	300	23.0	J	21.2	J	12.2	U
8021B	Benzene	µg/kg	25	9.20	U	8.85	U	9.45	U
8021B	Toluene	µg/kg	6,500	18.4	U	17.7	U	18.9	U
8021B	Ethylbenzene	µg/kg	6,900	18.4	U	17.7	U	18.9	U
8021B	o-Xylene	µg/kg	63,000 (total xylenes)	18.4	U	17.7	U	18.9	U
8021B	P & M -Xylene	µg/kg		36.8	U	35.3	U	37.7	U

Analysis	Analyte	Units	ADEC Cleanup Level ¹	15-RBY-SB-07-4		15-RBY-SB-08-4	
PID reading (ppm)				<1		<1	
AK101	Gasoline Range Organics	mg/kg	250	1.74	U	1.95	U
AK102	Diesel Range Organics	mg/kg	300	12.4	U	12.2	U
8021B	Benzene	µg/kg	25	8.65	U	9.75	U
8021B	Toluene	µg/kg	6,500	17.4	U	19.5	U
8021B	Ethylbenzene	µg/kg	6,900	17.4	U	19.5	U
8021B	o-Xylene	µg/kg	63,000 (total xylenes)	17.4	U	19.5	U
8021B	P & M -Xylene	µg/kg		34.7	U	39.0	U

Key:

1	18 AAC 75.345 Method 2 Tables B1 and B2 (under-40-inch zone) soil cleanup levels
mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
ppm	parts per million
NA	not analyzed
U	analyte not detected; limit of quantitation (LOQ) listed
J	estimated quantity; analyte detected below LOQ
UB	result qualified as not detected due to method-blank contamination
JH	estimated quantity, biased high (due to QC failures)
bold	result exceeds the cleanup level

Soil sample results and test-pit observations for the former AST area show a similar distribution of contaminated soil (as for the UST area, consistent with small historic surface releases); however, concentrations of DRO, BTEX, and PAHs were substantially lower. Contaminated soil was evident within one foot of the surface, covered by a thin layer of gravel fill. One potential former tank support (an old creosote beam) was uncovered at about one foot bgs. Soil in this area was a uniform fine brown silt.

4.6.2.3 Crawlspace Results

Soil-sample results for detected analytes from crawlspace are presented in Table 3 (below). DRO and GRO were detected at low levels in crawlspace soil sample, but were at least an order of magnitude below cleanup levels. No BTEX or other VOCs were detected in crawlspace soil samples.

TABLE 3: CRAWLSPACE SOIL SAMPLE DETECTED RESULTS

Analysis	Analyte	Units	ADEC Cleanup Level ¹	15-RBY-CS-18-1		15-RBY-CS-19-1		15-RBY-CS-21-1	
PID reading (ppm)				<1		<1		<1	
AK101	Gasoline Range Organics	mg/kg	250	6.37		2.55	J	1.71	J
AK102	Diesel Range Organics	mg/kg	300	13.1	J	32.8		56.2	

Analysis	Analyte	Units	ADEC Cleanup Level ¹	15-RBY-CS-24-1		15-RBY-CS-26-1	
PID reading (ppm)				<1		<1	
AK101	Gasoline Range Organics	mg/kg	250	1.21	J	1.75	U
AK102	Diesel Range Organics	mg/kg	300	15.6	J	12.2	U

Key:

1	18 AAC 75.345 Method 2 Tables B1 and B2 (under-40-inch zone) soil cleanup levels
mg/kg	milligrams per kilogram
ppm	parts per million
U	analyte not detected; limit of quantitation (LOQ) listed
J	estimated quantity; analyte detected below LOQ

4.6.3 Air Sample Results

Air-sample results for detected analytes are shown

TABLE 4: AIR SAMPLE DETECTED RESULTS

Analysis	Analyte	Units	ADEC Target Level ¹	Crawlspace_NE	Crawlspace_SW	Furnace_Rm
TO-17	1-Methylnaphthalene	µg/m ³	15	0.20 U	0.20 U	0.26
TO-17	2-Methylnaphthalene	µg/m ³	61	0.20 U	0.20 U	0.33
TO-17	Benzene	µg/m ³	16	1.6	1.3	1.9
TO-17	Ethyl Benzene	µg/m ³	49	0.86 U	0.86 U	0.86 U
TO-17	m,p-Xylene	µg/m ³	440 (total xylenes)	1.7 U	1.7 U	3.0
TO-17	Naphthalene	µg/m ³	3.6	0.25	0.20 U	0.59
TO-17	Toluene	µg/m ³	21900	2.4	2.5	4.6

Analysis	Analyte	Units	ADEC Target Level ¹	Main_hall_A	Main_hall_B	Outdoor_air
TO-17	1-Methylnaphthalene	µg/m ³	15	0.20 U	0.20 U	0.20 U
TO-17	2-Methylnaphthalene	µg/m ³	61	0.22	0.21	0.20 U
TO-17	Benzene	µg/m ³	16	1.6	1.8	1.3
TO-17	Ethyl Benzene	µg/m ³	49	0.91	0.90	0.86 U
TO-17	m,p-Xylene	µg/m ³	440 (total xylenes)	3.3	3.1	1.8
TO-17	Naphthalene	µg/m ³	3.6	0.50	0.48	0.20 U
TO-17	Toluene	µg/m ³	21900	5.2	5.2	2.9

Key:

- ¹ Target levels for commercial indoor air, ADEC Vapor Intrusion Guidance (2012)
- µg/m³ micrograms per cubic meter
- U analyte not detected; limit of quantitation (LOQ) listed

Several petroleum-related VOC analytes were detected in indoor air, crawlspace air, and outdoor air. Concentrations were generally higher in indoor air than in crawlspace or outdoor air, suggesting a potential indoor source (i.e. the floor or disconnected fuel piping in the furnace room). However, all concentrations were below ADEC target levels for commercial indoor air.

While these results suggest that vapor intrusion is not occurring under current conditions, and that indoor sources are not contributing to indoor air concentrations above target levels at this time, the sampling was conducted in the winter under unheated conditions, which are likely not representative of future use conditions. Therefore, these data should not be used to rule out potential vapor intrusion into the building, especially given some of the contaminant concentrations detected in soil borings and test pits within close proximity to the building.

4.7 Quality Assurance Summary

Data quality was reviewed by ADS and a data quality assessment (DQA) prepared for analytical soil-sample and air-sample results. ADEC data quality review checklists were prepared for each work order. The DQA and checklists are provided in Appendix E. The following is a brief summary of data quality issues that affected data quality.

For soil samples, three GRO results, five toluene results, and one p&m-xylene result were qualified ('UB' or 'JH') due to sample contamination identified in corresponding method blanks. GRO results for seven samples were qualified as estimated, biased high ('JH') due to matrix interference identified by high surrogate recovery. Samples with biased GRO results also contained high levels of DRO, so impact to data usability was minimal. Overall, sensitivity, precision, accuracy, representativeness, comparability, and completeness were deemed acceptable for purposes of this project.

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5.0 ENVIRONMENTAL REVIEW AND SUMMARY OF FINDINGS

This section provides a summary of previous environmental site reconnaissance work and the findings of our site investigation.

5.1 Historical Environmental Review

Previous environmental site reconnaissance is limited to a site visit in 2013 by ADNR personnel, including ADNR representative Patty Burns. ADNR completed an ADEC spill report following their site visit, based on a fuel odor near the UST fill pipe and a “chemical” odor in the crawlspace. No samples were collected. The spill report and attachment were included in the 2015 brownfields assessment or cleanup request (Appendix A).

5.2 Potential Source Areas

Two sources of contamination were identified in the course of our investigation. Soil in the vicinity of the UST contained GRO, DRO, BTEX, and several PAHs above migration-to-groundwater cleanup levels, with some analytes also present above direct contact and/or inhalation cleanup levels. Contaminated soil in this location was also fairly localized, with a similar vertical extent, though it extended beneath the building. Soil in the vicinity of the former ASTs contained DRO above migration-to-groundwater cleanup levels. Contaminated soil in this location had a fairly limited horizontal extent, with a vertical extent of 1 foot bgs to about 9 feet bgs.

Contaminant distribution is consistent with interview findings that small spills and overfills from drums used to fill the storage tanks are the likely source of contamination. There were no reports of large spills at the site.

5.3 Data Gaps

While our sampling near the UST indicated a vertical extent of about 9 feet bgs, we were unable to locate the base of the tank or sample at depth to the northwest, northeast, or southeast of the tank. Therefore, soil conditions beneath and around the base of the tank are unknown, and the possibility of a leaking UST cannot be ruled out until the tank is removed and confirmation sampling conducted.

Indoor air was sampled in March 2016; however, this sampling was conducted with the building unheated. Additional air sampling events should be conducted following site cleanup, ideally one in each season (summer, fall, winter, and spring) under anticipated use conditions (heated) to determine whether vapor intrusion may present an ongoing exposure risk.

Groundwater is anticipated to be deep at the site (Section 3.1), and is not likely to be impacted by contamination from the two source areas identified. However, there may be preferential pathways or deeper contamination beneath the UST that could result in groundwater contamination. The community expressed interest in finding and rehabilitating the on-site drinking water well when the site is redeveloped, and there may be off-site wells nearby that are not yet identified. This data gap could be filled in part by locating the on-site drinking water well and sampling it with a

portable pump. If contamination is found to extend off site or to a greater depth than anticipated, a well search should be conducted for the area surrounding and downgradient of the site.

5.4 Conceptual Site Model

A conceptual site model (CSM) was prepared for the site based on our current understanding of site contamination and exposure routes. The CSM graphic form and scoping form are included in Appendix F. The CSM does not include hazardous materials not regulated by ADEC, including HBM such as asbestos. Instead, information regarding risk from HBM is summarized in the HBM survey (Appendix D), and specific steps to mitigate exposure to HBM are proposed in Section 6.3.

5.4.1 Contaminants of Potential Concern

Contaminants of potential concern include petroleum hydrocarbons and related compounds (BTEX and PAHs). Contaminants of concern that have been measured above cleanup levels include GRO, DRO, benzene, toluene, ethylbenzene, o-xylene, p&m-xylene, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene. No VOCs were detected in crawlspace soil samples, and no sources of VOC contamination (other than petroleum-related VOCs) are likely to exist based on historic site use.

5.4.2 Exposure Pathways

The following exposure pathways are considered potentially complete.

- **Incidental soil ingestion.** Contaminants are present in soil within 15 feet of the ground surface above direct contact/ingestion cleanup levels. This pathway is considered complete.
- **Dermal absorption of contaminants from soil.** PAHs are present in soil, and may be absorbed dermally. This pathway is complete, but PAH results did not exceed direct contact cleanup levels, where detected.
- **Ingestion of groundwater.** While considered unlikely due to anticipated groundwater depth and anticipated distribution of soil contamination, contaminants are present in soil above migration-to-groundwater cleanup levels. Groundwater contamination may be present and groundwater may be a current or future source of drinking water. Ingestion of groundwater is considered a potentially complete pathway.
- **Dermal absorption of contaminants in groundwater.** PAHs are present in soil above migration-to-groundwater cleanup levels, may be present in groundwater, and can be dermally absorbed. Dermal absorption of groundwater is considered a potentially complete pathway.
- **Inhalation of volatile compounds in tap water.** Volatile contaminants (GRO & BTEX) are present in soil above migration-to-groundwater cleanup levels, may be present in groundwater, and could be inhaled if groundwater is used for household purposes (bathing,

drinking, etc.). Inhalation of volatile compounds in tap water is considered a potentially complete pathway.

- **Inhalation of outdoor air.** Volatile contaminants (GRO & BTEX) are present above outdoor inhalation cleanup levels in soil within 15 feet of the ground surface. This pathway is considered complete.
- **Inhalation of indoor air.** Volatile contaminants (GRO & BTEX) are present in soil within 50 feet of the building. While vapor intrusion is considered unlikely due to passive ventilation of the crawlspace and the results of our March 2016 air sampling, it should not be ruled out. The vapor intrusion pathway is potentially complete.

5.4.3 Current and Future Receptors

Current receptors for soil and air exposure routes include site visitors, trespassers, or recreational workers; potential future receptors also include residents, construction workers, and farmers or subsistence harvesters. Current receptors for groundwater exposure routes include nearby residents who may rely on groundwater as a drinking-water source; potential future receptors also include workers or site visitors, in the event the on-site well is returned to use or another well installed at the site for non-residential use.

5.4.4 CSM Summary

Exposure via the incidental soil ingestion, dermal absorption of contaminants from soil, and the outdoor inhalation exposure pathways are complete and likely to present the greatest current risk of exposure to contaminants at the site. The groundwater exposure pathways and inhalation of indoor air pathways are potentially complete.

5.5 Cleanup Criteria

For soil contamination, 18 AAC 75.341 Method Two Tables B1 and B2 soil cleanup levels for the Under-40-Inch Zone (most stringent pathway) are applicable for this site. For potential groundwater contamination, 18 AAC 75.345 Table C groundwater cleanup levels are applicable. The ADEC is anticipated to revise soil and groundwater cleanup levels in the near future. Table 5 (below) lists cleanup levels for petroleum hydrocarbon ranges (GRO and DRO); these levels are not subject to the upcoming cleanup-level revisions. Table 6 (below) lists current and proposed future soil and groundwater cleanup levels relevant to individual contaminants of potential concern.

TABLE 5: CURRENT METHOD TWO CLEANUP LEVELS, PETROLEUM HYDROCARBONS

Contaminant	Ingestion (mg/kg)	Inhalation (mg/kg)	MTGW (mg/kg)	GW (mg/L)
Gasoline range organics	1,400	1,400	300	2.2
Diesel range organics	10,250	12,500	250	1.5
Residual range organics	10,000	22,000	11,000	1.1

Key:

MTGW migration to groundwater

GW groundwater

mg/kg milligrams per kilogram

mg/L milligrams per liter

TABLE 6: CURRENT AND PROPOSED METHOD TWO CLEANUP LEVELS, INDIVIDUAL COMPOUNDS

Contaminant	2008 Direct Contact (mg/kg)	2008 Outdoor Inhalation (mg/kg)	2015 Proposed Human Health (mg/kg)	2008 MTGW (mg/kg)	2015 Proposed MTGW (mg/kg)	2008 GW (mg/L)	2015 Proposed GW (mg/L)
Benzene	150	11	11.3	0.025	0.022	5	4.54
Toluene	8,100	220	203	6.5	6.66	1,000	1,100
Ethylbenzene	10,100	110	49.3	6.9	0.133	700	14.9
Xylenes	20,300	63	55.4	63	1.53	10,000	193
Acenaphthene	2,800		4,650	180	36.9	2,200	534
Acenaphthylene	2,800		2,320	180	18	2,200	261
Anthracene	20,600		23,200	3,000	385	11,000	43.4
Benz[a]anthracene	4.9		2.03	3.6	0.28	1.2	0.12
Benzo[a]pyrene	0.49		0.204	2.1	0.266	0.2	0.0343
Benzo[b]fluoranthene	4.9		2.04	12	2.72	1.2	0.343
Benzo[g,h,i]perylene	1,400		2,320	38,700	15,500	1,100	602
Benzo[k]fluoranthene	49		20.4	120	26.6	12	0.8
Chrysene	490		204	360	81.9	120	2
Dibenz[a,h]anthracene	0.49		0.204	4	0.866	0.12	0.0343
Fluoranthene	1,900		3,100	1,400	589	1,500	260
Fluorene	2,300		3,100	220	36.3	1,500	294
Indeno[1,2,3-cd]pyrene	4.9		2.04	41	8.84	1.2	0.19
Methylnaphthalene, 1-	280	760	228	6.2	0.4	150	11.1
Methylnaphthalene, 2-	280	750	310	6.1	1.27	150	35.9
Naphthalene	1,400	28	28.6	20	0.0381	730	1.65
Phenanthrene	20,600		2,320	3,000	38.9	11,000	175
Pyrene	1,400		2,320	1,000	86.8	1,100	121

Key:

MTGW migration to groundwater

GW groundwater

mg/kg milligrams per kilogram

mg/L milligrams per liter

5.5.1 Hazardous Building Materials

While there is no established concentration (for building materials) at which asbestos can be considered “safe,” the EPA regulates ACM under the National Emissions Standards for Hazardous Air Pollutants at a threshold level of 1% asbestos (as determined by polarized light microscopy). This threshold was used in the HBM survey (Appendix D), and any ACM with an asbestos content over 1% should be considered for mitigation and/or abatement.

HUD has a standard for lead in paint of 1.0 mg/cm². No lead was detected above this threshold, both through XRF field screening or in paint samples submitted for laboratory analysis.

5.6 General Environmental Overview

Two areas of localized soil contamination were identified, with DRO, BTEX, and PAH concentrations exceeding soil cleanup levels. Soil contamination is likely attributable to multiple small releases from tank-filling operations at the UST and former generator-building ASTs (tanks were historically filled from drums). There are multiple potentially complete exposure pathways to contamination at the site, including incidental soil ingestion, dermal absorption of contaminants from soil, inhalation of outdoor air, inhalation of indoor air, ingestion of groundwater, dermal absorption of contaminants from groundwater, and inhalation of volatile compounds in tap water. In addition to the identified soil contamination, there are hazards present in the building itself. Seven different building materials contained asbestos above the 1% threshold. The following sections provide specific recommendations to address the risks of exposure to contaminants or HBM identified in the course of our investigation.

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6.0 RECOMMENDED ACTIONS/OPINION

We recommend excavation and remediation of contaminated near-surface soil, combined with mitigation of ACM exposure risk by managing the ACM in place. Section 6.1 presents detailed recommended remedial actions by source area. Section 6.2 proposes strategies to manage risk of asbestos exposure for the building. Section 6.3 includes general remediation strategies, including for contaminated-soil treatment (rhizoremediation), mitigation of exposure risk from any contamination not excavated and treated, and the resources (both local and external) that could be employed to achieve remediation objectives.

6.1 Recommended Remedial Actions by Source Area

While the source areas are similar in size and nature, the UST area is constrained by the presence of the building and thus requires a slightly different approach. Further, the tank should be removed and properly disposed.

6.1.1 UST Area

Soil contamination in the UST area is defined by source-area samples from test pit TP-02 and soil borings SB-10. Its boundary is defined by field screening and analytical results from samples at depth (9.5 feet bgs) in TP-02 and at 2 and 4 feet bgs in SB-14, SB-13, SB-12, SB-11, and SB-15. SB-16 was collected immediately adjacent the crawlspace skirting, below the building footprint, and contained DRO above cleanup levels. We estimate the horizontal extent of accessible soil contamination to be approximately 420 square feet, equating to a contaminated-soil volume of approximately 160 cubic yards (cy) assuming an excavation depth of 10 feet bgs.

We recommend excavating as much contaminated soil as feasible without undermining the building foundation, to an anticipated depth of 10 feet (or until clean limits are reached). It is possible additional, deeper contamination will be identified beneath the UST when the UST is removed. Given that contaminated soil extends beneath the building, removal of all contaminated soil in this source area is not feasible. Therefore, removal of contaminated soil beyond 10 feet is not likely to appreciably reduce exposure risk further. Risk of exposure to any remaining soil contamination should be mitigated as described in Section 6.3.2.

The UST should be removed during excavation of the contaminated soil in this source area. Precautions will need to be taken for safe tank removal. The tank should be properly emptied (if liquid content remains), purged, and rendered inert to bring the lower explosive limit to safe levels. The tank should be removed, cut as to render it unusable, and disposed of in the Ruby landfill.

PID field screening should be used to guide excavation. Following excavation and tank removal, confirmation samples should be collected at the required frequency and analyzed for DRO, GRO, BTEX, and PAHs. Excavated soil should be managed and treated in accordance with the strategies outlined in Section 6.3.1.

6.1.2 Former AST Area

Contaminated soil in this location was well defined through field screening and sampling from test pit TP-01 and subsequent soil borings (SB-01 through SB-08). We estimate the horizontal extent of accessible soil contamination to be approximately 740 square feet, equating to a contaminated-soil volume of approximately 270 cy assuming an excavation depth of 10 feet bgs. It is feasible that contaminated soil can be completely removed from this location.

PID field screening should be used to guide excavation. Following excavation, confirmation samples should be collected at the required frequency and analyzed for DRO, GRO, BTEX, and PAHs. Excavated soil should be managed and treated in accordance with the strategies outlined in Section 6.3.1.

6.2 Hazardous Building Material Mitigation

There are three basic options that could serve to reduce the risk of exposure to asbestos in the building: management in place, encapsulation, or abatement.

The only asbestos identified in the building is non-friable, as noted in the HBM survey and supporting letter (Appendix D). While some of the material is in poor condition (e.g. Figure 12, right, and Phtos 29-34 in Appendix G), it is not so deteriorated to render it friable. Thus, as long as precautions are taken to avoid any activities that could render it friable, there is no significant exposure risk.



FIGURE 12 – DAMAGED SHEET VINYL (25% ASBESTOS)

If the building is eventually reused, it will likely require renovation, as much of the interior in the northeast end of the building (including the ACM flooring) is in poor condition. At this point the decision must be made to either encapsulate the ACM during renovation for continued management in place, or to abate (remove) the ACM. Alternately, if the building is to be demolished, abatement must take place prior to demolition. Both activities require appropriate training and controls to keep workers safe and to comply with federal laws. Recommendations for encapsulation or abatement are outside of the scope of this PACP, but either encapsulation or abatement must take place if any renovation or demolition work is to occur. In the meantime, we recommend managing the ACM in place in its current condition.

ADNR has the ultimate responsibility for managing ACM exposure at the site as long as they remain the landowner. In the short term, we recommend that the ADNR control access to the building to the extent possible to prevent unauthorized personnel from entering the building, and educate anyone granted access to the building on the importance of not disturbing the ACM and the risks of asbestos exposure. The goal is to prevent any unauthorized work on the building that could cause the ACM to become friable and release asbestos fibers. Given the remoteness of the

site, this may require careful coordination with community leaders to control access and facilitate adequate communication of risks.

If the ADNR is to re-lease the building with ACM managed in place, a building asbestos operations and maintenance program in accordance with federal guidelines is recommended. Such a program details work practices to maintain ACM in good condition, clean up any asbestos fibers previously released, prevent further release of asbestos, and monitor the condition of the ACM. If the ADNR transfers the property to the community, there should be stipulations for ACM management or abatement that are sufficient to protect against asbestos exposure.

6.3 General Remediation Strategies or Alternatives

The following sections describe general strategies for contaminated soil management and mitigation of exposure to any remaining contamination following excavation of the source areas described above.

6.3.1 Soil Management and Treatment Strategies

Potentially contaminated soil should be segregated based on PID field screening. A screening threshold of 20 ppm appears appropriate based on comparison of field screening and analytical results for samples collected during our investigation, and is consistent with standard practice. Potentially clean soil may be staged on site, sampled for analysis of contaminants of concern (listed in Section 5.4.1), and if below cleanup level reused as fill in the base of excavations. Excavated areas should be backfilled following contaminated soil removal and confirmation sampling.

Contaminated soil may be treated by a number of means. Thermal desorption is cost-prohibitive due to the volume of contaminated soil and the remote location of the site. Landfarming is a reliable and effective soil treatment option, and has been widely employed at rural sites, but requires active management and may increase exposure risk and contaminant migration in the short term. Alternately, soil treatment through ex-situ rhizoremediation (plant-root facilitated microbial degradation) may be implemented for a lower overall cost and may serve to reduce exposure to contaminants more effectively during treatment.

We recommend treating contaminated soil via ex-situ rhizoremediation. Rhizoremediation is a passive means of treating contaminated soil through biological action by planting vegetation to create a favorable and sustainable environment in the root zone for microbes that break down the contaminants over time. It is a form of phytoremediation, or “remediation by plant.” A key advantage of this alternative is that it achieves quick reduction of exposure risk and contaminant migration once the vegetative cover is established, by stabilizing the soil surface and reducing contaminant migration via windblown dust, surface runoff, and subsurface leaching. Also, it requires minimal management, and has the lowest cost of the soil treatment strategies considered. The primary disadvantage is the length of time required to achieve cleanup goals (estimated at 3 to 6 years).

6.3.2 Exposure Mitigation Strategies

It is likely that not all contaminated soil will be removed from the UST source area. Contamination extending beneath the building is not accessible without undermining the foundation. We recommend continued crawlspace ventilation and air monitoring to mitigate exposure to any remaining contamination. Passive vents have been installed in the southwest half of the building crawlspace (including the area near the UST) and air samples collected from the crawlspace during March 2016 suggest this strategy is working to prevent vapor intrusion into the building. Vents should be installed on the northeast half of the crawlspace to ensure adequate ventilation throughout the crawlspace.

Given that there may be indoor sources of background air contamination, including the fuel-impacted flooring and disconnected fuel piping in the furnace room, we recommend no further indoor-air sampling until these potential background sources are addressed. Instead, we recommend twice-annual sampling of air in the building crawlspace to evaluate the vapor intrusion pathway. Ideally, sampling would occur in September when soil temperatures are warm and heating demand begins, and January or another winter month with high heating demand (and thus greatest potential stack effect in the building). We recommend collecting at least two crawlspace air samples, a duplicate, and an outdoor air sample. If carbon sorbent tubes are used, a trip blank should accompany samples. Analytes should include BTEX and naphthalene at a minimum.

6.3.3 Water Management Strategies

Groundwater is deep at the site, and unlikely to be impacted by contamination. Therefore, the only water management strategies that should be necessary during site cleanup are basic steps to control runoff during excavation activities (basic storm-water management, including silt fences or booms as needed). If it is determined contamination may have migrated to groundwater upon excavating the contaminated soil (i.e. if contamination at the base of excavation appears to be increasing or preferential pathways are identified), then it is recommended to sample groundwater and conduct a well search.

6.4 Community Resources

A number of community resources exist that may be employed during site cleanup and soil treatment. These are discussed below.

6.4.1 Land

Suitable land for soil treatment by rhizoremediation will be required. Several suitable locations exist within reasonable hauling distance from the site. These include gravel pits on the Ruby-Poorman Road, at roughly 3 miles, 4 miles, or 4.5 miles from the site (Figure 13, right). An old dumpsite is present across the road from the 3-mile pit; this may be the most advantageous treatment location, as it is flat, level, and out of the way of ongoing gravel-mining operations. Photos of these gravel pits are included in Appendix G. We understand these gravel pits are owned by Dineega Corporation (surface rights) and Doyon Ltd. (mineral rights; Appendix B). Use of the gravel pits for soil treatment would need to be coordinated with and approved by these ANCSA corporations, as well as the ADEC.



FIGURE 13 – GRAVEL PITS ON RUBY-POORMAN ROAD

6.4.2 Equipment

Various entities in Ruby own equipment that could be employed for soil excavation, hauling, and treatment site preparation. The following equipment is locally available for hire:

Kangas Construction

- Excavator – Hitachi 200
- Loader – Cat 966
- Dozer – Cat D-4 G
- Compactor
- Dump truck

Ruby Tribal Transportation Department

- Loader – Case 921
- Skid-steer loader – Cat 299D
- Dump truck – Autocar (8 cy) and Freightliner (10 cy)
- Grader – Cat
- Dozer – Cat D6

City of Ruby

- Dozer – Cat w/backhoe extension
- Backhoe – Case w/1-cy bucket

We recommend, and have included in our general cost estimate, contracting with Kangas Construction for excavation, hauling, and treatment site preparation as they have the complete fleet of equipment and qualified personnel needed to ensure successful site cleanup.

6.4.3 Labor

There are a number of HAZWOPER-trained individuals in Ruby with varying levels of experience. In addition to local workers, there is a substantial trained workforce in nearby Galena, both through the Loudon Tribal Council and Gana-a-Yoo. Given the uncertainty in who may be current on their HAZWOPER training, names of potentially qualified workers are not listed here.

6.4.4 Potential Funding Sources and Resource Leveraging Opportunities

We understand that ADNRC and RTC submitted a DBAC funding request for FY2017 and their application was recently selected for award, so DBAC funds are likely to be the funding source for remedial action at the site this upcoming field season. However, further work may be needed to renovate or demolish the building prior to reuse. The RTC discussed requesting a legislative appropriation, among other potential funding sources, to address the building hazards and redevelop the site. It is likely that funding for ACM abatement could be included in a redevelopment proposal, whether that includes renovation or demolition/reconstruction. However, given the state's current fiscal crisis, legislative appropriations will be scarce for some time. Other potential funding sources include HUD and US Department of Agriculture (USDA) community development grants and loans.

Resource leveraging opportunities include developing a qualified local workforce for the potential work needed via training programs and grants. For example, the YRITWC hosts periodic training events such as HAZWOPER and asbestos worker trainings. Other training may be available through EPA environmental workforce development and job training grantees.

6.5 General Outline of Remedial Actions

Table 7 outlines the recommended remedial actions by source area.

TABLE 7: RECOMMENDED REMEDIAL ACTIONS BY SOURCE AREA

Source Area	Recommended Remedial Action
UST area	- Excavate contaminated soil - Remove and dispose UST - Treat contaminated soil by rhizoremediation - Improve crawlspace ventilation - Continue air monitoring quarterly for one year to check for vapor intrusion
Former AST area	- Excavate contaminated soil - Treat contaminated soil by rhizoremediation
Existing building (former Headstart)	- Management of ACM in place (in current condition) until reuse determination is made - Encapsulation or abatement prior to any renovation - Abatement prior to demolition

6.6 General Cost Estimate

A cost estimate was prepared for implementing recommended remedial actions for the two contaminated-soil source areas, and is presented in Table 8. The cost estimate does not include any activities related to the building itself. Management of the ACM in place in its current condition is likely to involve minimal additional cost, and any ACM management, encapsulation, or abatement is outside the scope of any further brownfields-funded site work.

TABLE 8: GENERAL COST ESTIMATE

Item	Work Plan, Coordination, Project Management	Contaminated Soil Removal and UST Closure	Soil Treatment - Rhizoremediation	Air Sampling - 2 events	Reporting
Labor	\$8,000	\$7,000	\$6,000	\$4,000	\$7,000
Subcontract and laboratory	\$0	\$33,000	\$7,000	\$3,000	\$0
Equipment and supplies	\$0	\$1,000	\$1,000	\$1,000	\$0
Materials	\$0	\$5,000	\$1,000	\$0	\$0
Other direct costs	\$1,000	\$2,000	\$2,000	\$2,000	\$100
TASK TOTALS	\$9,000	\$48,000	\$17,000	\$10,000	\$7,100
Contingency (15%)	\$1,200	\$6,900	\$2,200	\$1,200	\$1,000
TOTALS with contingency:	\$10,200	\$54,900	\$19,200	\$11,200	\$8,100
Project total					\$103,600

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7.0 CONCLUSIONS

Background research into the history of the site revealed decades of use as a state school prior to 1975. During this time, the property was owned and managed by the BLM. Land ownership was transferred to the State of Alaska in 1976. While use of the site as a state school ceased in the late 1970s, the property was leased from 1989 to 2006 by the City of Ruby and operated as a preschool by the TCC's Headstart program for most of this time period. During the site's historical use as a state school, and potentially during later use by the City and TCC, heating oil fired furnaces and generators were the primary source of heat and electricity at the site, and numerous small releases may have occurred during fuel-handling operations.

Soil contamination above migration-to-groundwater soil cleanup levels was identified in two areas at the site: the heating-oil UST area and the former AST area. Contamination was present at higher levels near the UST, where concentrations exceeded direct contact and inhalation cleanup levels in some cases. Contamination appeared relatively localized, extending from approximately 1 foot to 10 feet bgs, with estimated contaminated soil volumes of 160 cy and 270 cy for the UST area and the former AST area, respectively.

Numerous complete exposure pathways exist to contamination at the site. Exposure through incidental soil ingestion, dermal absorption of contaminants from soil, inhalation of outdoor air, and inhalation of indoor air are most likely the dominant pathways for current exposure. Groundwater is deep at the site and not likely to be impacted, though exposure pathways related to groundwater use cannot be ruled out at this time.

Exposure to contaminated soil through direct contact and inhalation pathways is best controlled by removing a bulk of the contaminated soil and monitoring and controlling exposure to any remaining contamination (e.g. contamination that extends below building) through adequate mitigation. We recommend excavating contaminated soil to the extent feasible and treating it via ex-situ rhizoremediation. Following contaminated-soil removal, we recommend further venting of the crawlspace and air sampling in the building crawlspace to determine whether crawlspace ventilation is protective of the inhalation of indoor air exposure pathway. We also recommend further investigation of potential groundwater contamination if it is found or suspected that contamination may have migrated to the depth of groundwater during remedial activities.

By removing and treating soil to reduce or eliminate the direct contact exposure pathways, and through careful mitigation and monitoring of inhalation exposure pathways, risk should be adequately controlled to allow for safe redevelopment of the site. We understand it is the intent of the ADNRC and the community of Ruby to see the property conveyed to the community and redeveloped as a community gathering space in the future. This PACP report will ideally lay the groundwork for site cleanup, which will allow for conveyance and redevelopment.

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8.0 PERSONNEL QUALIFICATIONS

All staff working on this project, including lead author Rodney Guritz and project manager Andrew Weller, PE, meet the Alaska definition of qualified environmental professional (18 AAC 75.333), and have the necessary education, training, and experience to conduct this PACP. The HBM survey was conducted by Doug Dusek of NORTECH, a qualified environmental professional and certified AHERA asbestos inspector.

A full listed of qualified personnel and their credentials is included in Ahtna's ADEC spill prevention and response term contract and its attachments.

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9.0 LIMITATIONS

This PACP report contains observations and sample results obtained from the test pits, soil borings, air samples, and building samples collected during the site investigation and HBM survey, as well as a limited file review. The findings and conclusions presented in this PACP report are the result of professional interpretation of the information collected at the time the fieldwork was performed. Sampling locations were largely determined based on potential sources of contamination identified through file review, local interviews, and professional judgement. Gravel fill placed over the site in 2011 further complicated visual identification of potential source areas. It is possible that additional unknown contamination is present on the site. Cost estimates are provided for general planning purposes only, and reflect limited information and rates available at the time of this report. Ahtna makes no warranty, express or implied, as to the findings and conclusions presented in this report.

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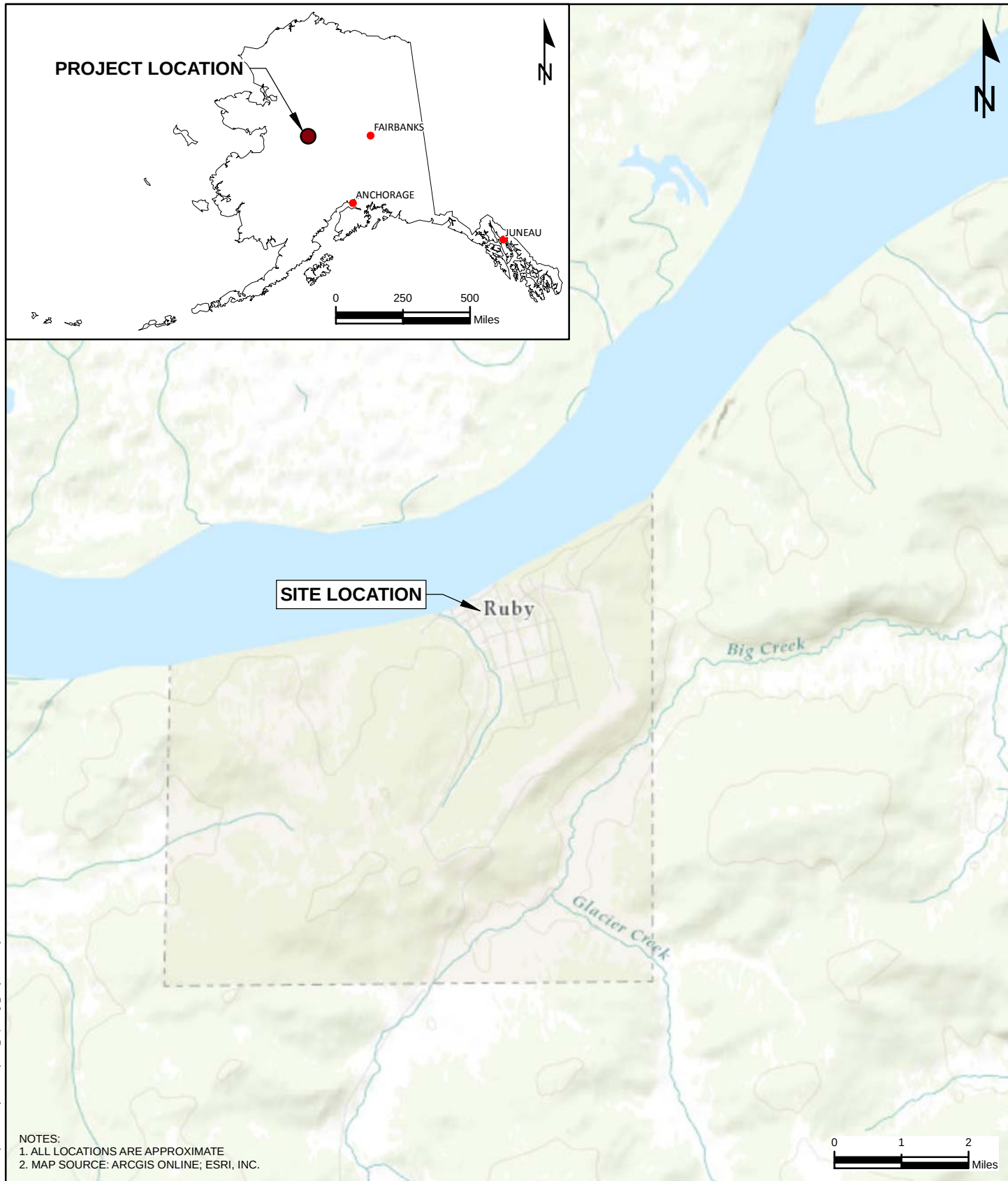
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FIGURES

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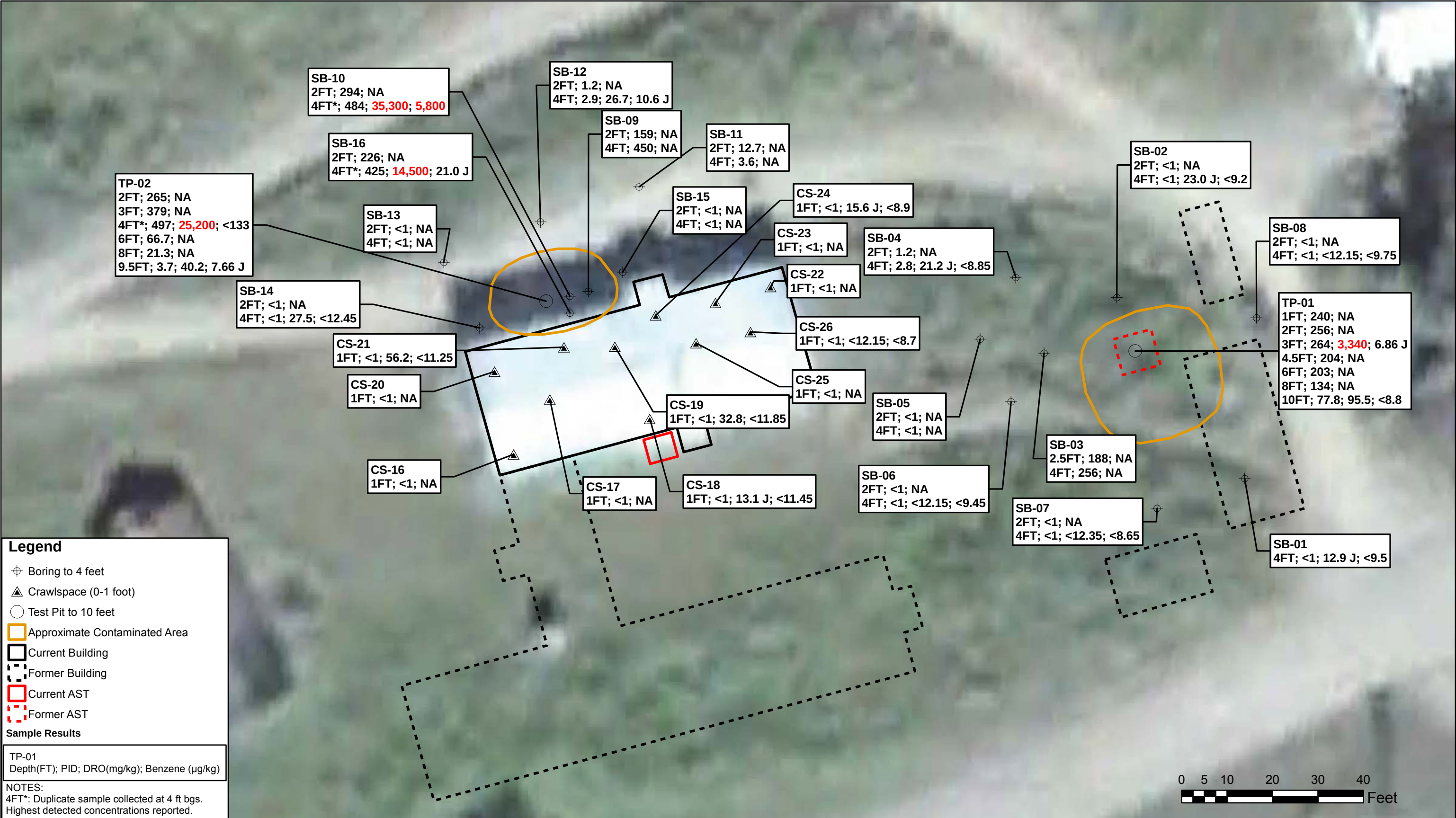
**PROPERTY ASSESSMENT AND CLEANUP PLAN
 FORMER HEADSTART BUILDING
 RUBY, ALASKA**



Project Number: 20266.012	Figure Number:
Date: 1/25/2016	1
Drafted By: sfox	

STATE AND SITE VICINITY

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Legend

- Boring to 4 feet
- Crawlspace (0-1 foot)
- Test Pit to 10 feet
- Approximate Contaminated Area
- Current Building
- Former Building
- Current AST
- Former AST

Sample Results

TP-01
Depth(FT); PID; DRO(mg/kg); Benzene (µg/kg)

NOTES:

4FT*: Duplicate sample collected at 4 ft bgs.
Highest detected concentrations reported.
NA: Sample not analyzed.

Aerial image from Google Earth, 2006.
Red text indicates the ADEC target level was exceeded for DRO (300 mg/kg) or benzene (25 µg/kg).
Purple Text indicates the detection limit was above the ADEC target level.

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APPENDIX A

DEC BROWNFIELDS ASSESSMENT

OR CLEANUP REQUEST 2015

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DEC's Contaminated Sites Program

Brownfield Assessment or Cleanup (DBAC) Request Form – 2015

General Requirements: The proposed site should be one for which the state or community has solid reuse or redevelopment plans. It would be beneficial if the community has also explored funding opportunities for the intended reuse.

The deadline for receipt of requests is January 30, 2015.

Site Name: ADNR Former Head Start Building - Ruby

Submitted by: Ruby Tribe and the State of Alaska, Department of Natural Resources

A. THRESHOLD CRITERIA: The following must be TRUE:

- This site **IS NOT** federally owned.
- To our knowledge, this site or facility **HAS NOT** received funding for remediation from the Leaking Underground Storage Tank (LUST) Trust Fund.
- The Applicant/Organization requesting this service **IS NOT** directly responsible for causing the potential contamination.
- The Owner of the property is not directly responsible for causing the potential contamination, **OR** the Owner has no financial capacity to properly address the assessment or cleanup of the site.
- There is a documented reuse or redevelopment plan for the site that is described in this request. (Documented means that it is in a resolution, business plan, or economic development plan, or that funding for reuse is actively being sought and can be documented).

If any of the above statements is NOT TRUE, your site is probably not eligible for brownfield services. If you have questions or concerns, please call us to discuss them.

B. UNRANKED CRITERIA

1. To the best of your knowledge, is the Owner of the property in question:

☐ Private ☐ City/Public ☐ Native Corp. ☐ Tribe ☒ State

2. Known or suspected contaminant(s) at the site (check one):

☐ Hazardous Substances ☐ Petroleum Only ☒ Hazardous Substances and Petroleum

3. Is this site currently listed on DEC's *Contaminated Sites Database*?

☒ Yes ☐ No If Yes, please list the DEC file number here: 870.38.004

4. Is this site referred to by any other name?

☒ Yes ☐ No ☐ Unknown
Building

If Yes, please provide name(s) here: Old Head Start

C. RANKING CRITERIA

The following ranking criteria will be used to prioritize and select one to three projects for our fiscal year 2016 funding (FY16 begins July 1, 2015). The number of sites selected depends on our actual FY16 funding amount. The project must provide a definite benefit to the community, and we must be able to cover the needed scope of work with our available funding. Each of these questions must have a response in order for your request to be considered.

1. Project Summary

Explain in your own words what you are hoping to gain through this effort; i.e., what would you like to see in place of the site for which you are requesting assessment or cleanup, and how will this project help you achieve your goals for the site?

We are requesting DEC Brownfields DBAC services to determine the magnitude and extent of contamination in order to determine a corrective action plan and facilitate reuse of the Old School site in Ruby.

2. Applicant/Owner

a. Applicant - Who is applying for this service? Provide the name and address of the **organization** applying for the DBAC service, the name of the contact person, email, telephone, and fax numbers. If Applicant is Village IGAP staff OR Tribal Response Program staff, please provide the **name of your EPA Project Officer**.

Ruby Tribal Council
Brenda Ambrose
P.O. Box 210
Ruby, AK 99768

State of Alaska, Department of Natural Resources, Division of Mining Land & Water, Northern Region Lands Office.
Patty Burns
3700 Airport Way
Fairbanks, AK 99709

b. Property Owner - The owner of the property must allow DEC access to the site. If the applicant is different from the owner, attach written consent for access from the owner. (*Note: the applicant must be able to secure access for DEC and its contractors to conduct the assessment or cleanup.*)

State of Alaska, DNR-Lands is the site owner and will provide access to the site.

3. Project Team

We ask that you form a project team (three or more individuals or organizations) to ensure continuity beyond this effort and coordination for success of the overall project. Attach a letter of support from each team member. Team members may include: state agency personnel, city or village government representatives, city or tribal council members, village or regional corporation

representatives, environmental managers, elders or other community leaders, local non-profit or community development organizations, and other interested parties. List team members, the organizations they represent, and their contact information below.

Ruby Tribal Council, Brenda Ambrose, Tribal Administrator (907) 468-4479,
rubynativecouncil@hotmail.com

Department of Natural Resources, Patty Burns, Natural Resource Specialist (907) 451-3014,
patty.burns@alaska.gov

The City of Ruby, Mayor Katherine Dozette, (907) 468-4401, jenniehopsongmail.com

Ruby Tribal Council Indian General Assistance Program, Shaelene Nickoli, IGAP Coordinator,
(907) 468-4479, ruby_igap@hotmail.com

4. Site Information

a. Current Site Condition and Use - Provide the common name of the site, address, approximate acreage, zoning, and types of buildings. Please attach a site map or aerial photograph showing the site's location in the community and adjacent land use. Identify on the map or aerial photo any areas of known or suspected contamination (for Question 5). Identify approximate property boundaries.

The former Head Start building is located on a State-owned parcel in the community of Ruby, and is unoccupied at this time. Numerous spills associated with the management of fuel at the site are likely the cause of petroleum vapors that emanate in and around the building. A petroleum smell is evident near crushed piping that is close the assumed location of an abandoned underground storage tank (UST) on the north side of the structure. There is also a strong 'chemical' odor coming from the crawl space, which may or may not be attributed to petroleum releases.

View of north side of building and south side of building.



b. Historical Site Use - Describe, to the best of your ability, the previous known uses of the site, and when the different activities occurred. Summarize any historic or cultural significance of the

property. Identify when and how the site became or may have become contaminated, with what substance(s), and where any contamination is likely to be found.

The UST may date back to when the original Ruby School was built in 1934. The most recent heating of the building was provided for through the use of an above ground storage tank. This school was abandoned when a new school was constructed prior to 1979. The City of Ruby, under lease from the DNR, tore down several buildings, although it is not clear if a pre-existing structure on this property was part of that project or not, and the existing building may have been constructed at a later date. It is the current belief that the DNR is the owner of both the building and the property, although the history on the building is still unclear.

DNR issued letter of entry to City of Ruby in 1980, and reportedly a lease for the property in 1981; however, the City was not interested in leasing the building as of April 1981. However, the City allowed the Tanana Chiefs Conference to use the site in 1981 for its Head Start school function (it is not certain that this is the same building).

DNR records from December 1981 indicate that contamination was identified at the primary structure on the property resulting from vandalism with a fuel soaked floor documented. In 1981-82, the buildings were actually designated for demolition, but this did not occur. Further use of the site was documented after 1989 - no clarification on any actions taken by DNR on the pre-existing contamination reported in 1981. It is further not clear how the old impacts relate to new impacts that were identified in 2013 by DNR staff where a broken fuel pipe was observed, and fuel/chemical odors were noted in the vicinity of the piping and beneath the structure in the crawl space.

Additional contamination was reported downslope and presumably downgradient of this site, in the subsurface. Reported petroleum odors during the excavation for a basement

c. Reason for Concern - What is the reason for concern? Please discuss state or community concerns with the site in general, and identify any specific problems if possible.

Concerns are two-fold for the both the DNR and the community: (1) there is a high degree of concern over the potential for vapor intrusion into a building, rendering the building unusable for community use. This was apparent during the most recent site visits, whereby vapors were detected beneath the structure, in addition Ruby residents report the smell of hydrocarbons in the building; and (2) there is concern that contamination from this property may have migrated to groundwater and offsite, impacting the use of private property by residents in Ruby. Reports of strong odors in subsurface soil downslope from this structure lead DNR to believe that further assessment is warranted to help determine the potential liability to the State, and to help ascertain the level of cleanup that may be required.

5. Project Scoping Information

a. Findings from Past Environmental Assessments - Has the site had previous assessment activities?

☐ No ☐ DEC Brownfield Assessment (DBA) ☐ Targeted Brownfield Assessment (TBA)

☒ Other DNR site visit and spill report.

Please describe any previous environmental work that you are aware of, such as site assessments, sampling, or cleanup activities. It will be important that we have all documents and information if not already available in our files. Please attach copies of executive summaries or summary and conclusions sections from any past reports. If a DBAC service is approved for your project, complete copies of previous reports must be made available if not already in DEC files.

No site characterization has been completed for the site. DNR visited the site in 2012 and submitted a spill report documenting suspected contamination issues to DEC.

b. Project Need - Describe to the best of your ability what your project team believes are the needed environmental assessment or cleanup activities and what result you would like to see from this project. Include any constraints as to when this work must be completed (e.g., to meet construction timeline, property transaction pending, etc.).

The Ruby tribe would like to use the site for a variety of purposes. DNR is not able to authorize use of the site in its current condition, and in order to process a lease application to the City or Tribe, DNR needs assurance that users of the site will not be exposed to contamination.

DNR and the community believe that the structure is sound and readily useable for many future community uses. There are many ways to approach the project such that the site can be made useable by the community, even before cleanup is completed. We believe this is why this project is so important for a program such as brownfields, in that reuse can be made possible for a relatively smaller investment.

In order to move the project forward, we believe we require an evaluation of the potential sources of vapor intrusion at the site. We believe this could be completed with hand tools and field sampling equipment to evaluate the potential near surface releases at the site. Hand borings, field screening and sample collection would provide necessary information to DNR to determine what is necessary to make the structure useable.

DNR would like to have the building evaluated as well to determine if there are any indoor chemicals or sources of contamination that could impact the future use. Leaks associated with the furnace may have saturated floor materials, which may need to be removed before a vapor intrusion assessment can be completed. This building evaluation would either help drive a vapor intrusion assessment or compliment the findings, depending on how it is approached.

We would also like to have a vapor mitigation plan proposed based on the findings of the assessment. We understand that vapor intrusion can be managed even if cleanup is not always immediately feasible. We would like the potential to implement corrective action in the form of a mitigation plan, that might include recommendations such as vapor barrier, low flow ventilation, building skirting with preferential flow, or other forms of cost-effective vapor management, to enable use of the building sooner rather than later.

Further assessment would be useful to delineate subsurface impacts that hand tools cannot reach. Whether this is possible or not would be dependent on the available funding for this project. Groundwater contamination is a concern and it is our understanding that determining whether groundwater is impacted is a regulatory requirement. We therefore believe that form of assessment would also be useful; however, it is considered secondary to an evaluation of vapor intrusion and what can be completed to mitigate that and make the structure useful.

Lastly, depending on funding availability and the degree to which our assessment data allows, a plan could be developed for cleanup of the site. We realize that this would be difficult in the same field season, but it would be an obvious desired endpoint for this project.

6. Community Planning and Reuse

a. Reuse or Redevelopment Plans - It is critical that any brownfield project have a specific end use in mind that the requested assessment/cleanup services will help make possible. Please describe the beneficial reuse or redevelopment plan that this proposed work is meant to facilitate. Reuse goals can include: new construction or redevelopment using existing infrastructure, such as public housing, commercial facilities, community halls, museums, etc.; creation of recreation areas, community gardens or preservation of green space; enhancement of sustainable subsistence habitat; etc.

Both the City and the Tribe are interested in reusing existing infrastructure for a safe, up to date building for our community gatherings. Buildings of this nature are extremely important in rural Alaska communities, and very expensive to build from scratch. In this economic climate, funding for new construction is difficult to come by. Further, it is in everyone's best interest to reuse any and all appropriate infrastructure, easing the costs to the State, the user, and the public.

Uses may include potlatch functions, weddings, community gatherings, school functions, emergency housing, or support for a variety of other community functions yet to be determined. It is clear that it is both a necessary and potentially very cost-effective strategy to address the assessment needs which may enable renewed use of the building. Hopefully, even without potentially costly cleanup, we can identify a path that will allow DNR to lease the property and the community of Ruby to reuse this building.

b. Documentation of Reuse Planning - Please attach any documentation referencing resolutions, business planning, community planning, a proposal for grant funding, or loan applications, that helps support the vision for the reuse or redevelopment of the property in question. Examples may include documentation of public meetings been held specifically to discuss the reuse interests in the site, or a resolution passed by the city or tribal council showing support for the redevelopment.

DNR, the Ruby Tribe and the City of Ruby all support reuse and redevelopment of the site. A resolution from the Tribe and a letter of support from the City are attached. DNR has continued to coordinate its interest in revitalizing the use of the property with DEC over the past several years.

c. Other Community Plans or Projects - It is helpful to know if other work is being planned or underway in your community that may help assist in this effort, such as available equipment or other resources. Describe any other community projects that may be scheduled or pending, such as: water and sewer upgrades, a new landfill, road or airport construction, a new school or addition, fuel-storage tank farm upgrades or relocations, new housing, or construction/refurbishment/relocation of other facilities.

Several projects are currently underway in Ruby, including: the City of Ruby is currently working on the development and permitting for a new landfill; also the Ruby Tribal Council Transportation Program is in the process of starting a dust control monitoring program with UAF and DEC the summer of 2015.

7. Public Involvement

a. Public Benefit - Referring to Question 6(a) above, briefly describe how your proposed reuse or redevelopment plans for the property will provide a benefit to the public. Why is this important to your community? Some things to consider: creation of jobs, preservation of historically or culturally significant property, location for community activities or educational purposes, preservation of subsistence habitat, reuse or recycling of materials or infrastructure, cost savings to the community, or increased property values.

There are not many centrally located spaces available for community use in Ruby. This site is located near the center of the Village and is ideal for a variety of community uses including cook shack for Galena flood victims, Denakkanaaga, Yukon River Inner Tribal Watershed Council Summit, and Potlatches.

Location of Old Head Start Building



b. Community Support and Resources - Is the community strongly supportive of this project? Our contractors doing assessment or cleanup work often require local assistance with site visits, setting up interviews with people knowledgeable about the site, lodging, excavation equipment, and local transportation. Describe the community's support for this work and any local resources or individuals that are available to assist with the DBAC project work being requested.

All parties have been actively working together to try to identify a path forward. At this time, all are in agreement that this is the only real prospect for funding to obtain necessary information. DNR and the Ruby Tribe will work closely with the City of Ruby on this specific project and will provide support to the extent possible. We would recommend a kick-off meeting to discuss the assessment site visit so that coordination at the local level will support a DEC contractor in the field.

c. Community Resources for Other Phases of the Revitalization Project - Does the community have financial or other resources for other phases of the project, such as equipment, labor, in-kind services, or funding for cleanup or new construction? Will this DBAC be used to leverage other funding or services for the project? If so, please describe.

The City and the Tribe have access to equipment and operators, and are capable of providing support for cleanup operations, should they be required. The tribe can allocate some funds toward equipment operation as determined necessary.

DISCLAIMER (FINE PRINT)

The selection of a site for a DBAC in no way implies that DEC accepts liability for any contamination that may exist at the site, nor is DEC responsible for any necessary cleanup of hazardous substances that may be found at the site. Liability for contamination on a property is specifically addressed in Alaska Statute (AS) 46.03.822, which outlines those who are liable for the release of a hazardous substance. The general liability categories include: (1) those with an ownership interest in the property; (2) those in control of the substance at the time of the release; or (3) those who arrange for disposal or transport of the substance.

Brownfield work focuses on clarifying environmental concerns associated with property for which there is no known viable responsible party. By applying for a DEC Brownfield Assessment or Cleanup, it should be clear to all parties associated with a request that the work requested of DEC is designed to identify, clarify, and in some cases, remediate environmental hindrances that currently impede the continued use, proposed use, redevelopment, or sale of a property. Work conducted by DEC may result in identifying a property as a contaminated site, and require the site be listed on DEC's *Contaminated Sites Database*. With listing comes the requirement of potentially responsible and liable parties to address cleanup of contamination in accordance with regulatory requirements.

Submit Completed Forms by January 30, 2015 to:

Amy Diffenbacher
Alaska Department of Environmental Conservation
Juneau, AK
By email: amy.dieffenbacher@alaska.gov

DBAC Request Submittal Checklist

Before submitting your DBAC request form, please check the following items are complete:

- ☒ Did you answer each question?
- ☒ Did you attach a letter from the property owner granting access to the site, if the owner is different from the applicant, as described in Question 2(b)?
- ☒ Did you attach a letter of support from each team member for Question 3?
- ☒ Did you attach a site map or aerial photograph of the site with the information requested in Question 4(a) shown? See attached spill report
- ☒ Did you attach executive summaries or summary and conclusions sections from any past environmental reports about the site, as described in Question 5?
- ☒ Did you attach documentation of the reuse or redevelopment plans the community has for the site, as described in Question 6(a)? N/A - Very simple plan. See response in Question 6(a).



RUBY TRIBAL COUNCIL

AGNES M. WRIGHT BLDG.
P.O. BOX 68210
RUBY, ALASKA 99768

TELEPHONE: 907-468-4479
FAX: 907-468-4474

RUBY TRIBAL COUNCIL

Resolution No: 15-02

TITLE: A Resolution in Support of Brownfields Assessment of the Old Ruby Head start Property.

WHEREAS: The property of which the head start sits there is an old underground fuel tank, which causes fumes insides the building.

WHEREAS: The building was built in 1979 and the fuel tank was not removed from the demolition of a previous building, and there is suspected fuel contamination as a result,

WHEREAS: Fumes were seeping into the building overtime from the fuel tank,

WHEREAS: The building being used for community gatherings, it may be a threat to human health and safety,

WHEREAS: The village of Ruby needs to renovate the building, and it will continue to be used for community gatherings, and

WHEREAS: The planned renovation cannot occur with an environmental assessment.

THEREFORE BE IT RESOLVED that the Ruby Tribe hereby supports requesting the Alaska Department of Environmental Conservation for a Brownfields Assessment for the Old Ruby Head start Property

DATED THIS 28th OF January, 2015

Louella M. Peters for Katie Kangas
First Chief, Ruby Tribal Council

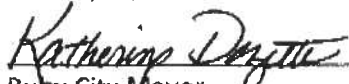
Joanne Adams
Secretary, Ruby Tribal Council

January 28, 2015

To: Patty Burns

I am writing this letter on behalf of the City of Ruby, we are in full support of Ruby Tribal Council's brownfields proposal. There are not many centrally located spaces available for community use in Ruby. If rehabilitated, the Old Headstart Building can be used by the community for many purposes including emergency housing during natural disasters, Denakkanaaga gatherings, the Yukon River Inner Tribal Watershed Council Summit, and Potlatches. We support the request for DEC Brownfields DBAC services to determine the magnitude and extent of contamination in order to determine a corrective action plan and facilitate reuse of the Old School site in Ruby, and will help with logistics to the extent possible when the DBAC services are rendered. If you have any questions or concerns feel free to contact myself or Jenny Hopson, the City Clerk, at 468-4401.

Thank you,


Ruby City Mayor



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Department of Natural Resources

DIVISION OF MINING, LAND & WATER
Northern Regional Land Office

3700 Airport Way
Fairbanks, Alaska 99709-4699
Main: 907.451.2740
TDD: 907.451.2770
Fax: 907.451.2751

January 29, 2015

Amy Dieffenbacher
ADEC Contaminated Sites Program
Reuse & Redevelopment
410 Willoughby Avenue, Suite 303
Juneau, Alaska 99811-1800

Dear Ms. Dieffenbacher:

The State of Alaska, Department of Natural Resources, Division of Mining, Land & Water, Northern Region Lands Office (DNR-Lands) is pleased to coordinate with the Ruby Tribe and the City of Ruby to submit a Brownfields DBAC request for services.

There is strong interest in and need for the citizens of Ruby to use the centrally located Old Headstart Building; however, due to concerns for public health, DNR-Lands is unable to authorize use of the building. DNR-Lands will support the DBAC proposal to the extent possible, including allowing access to the site.

Thank you for reviewing our request for DBAC services. We hope that utilizing DBAC services will move us toward revitalizing an important community resource in Ruby.

Sincerely,

A handwritten signature in blue ink, appearing to read "Patty Burns".

Patty Burns
Natural Resource Specialist III

cc: Brenda Ambrose, Ruby Tribal Council, Tribal Administrator
Shaelene Nickoli, Ruby Tribal Council IGAP Coordinator
Catherine Dozette, City of Ruby, Mayor



ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

OIL & HAZARDOUS SUBSTANCES SPILL NOTIFICATION FORM

CLEAR FORM

ADEC USE ONLY

ADEC SPILL #:	ADEC FILE #:	ADEC LC:
---------------	--------------	----------

PERSON REPORTING: Roselynn Ressa/Patty Burns		PHONE NUMBER: 451-2727/451-3014		REPORTED HOW? (ADEC USE ONLY) ☒ Phone ☐ Fax ☐ Troopers	
DATE/TIME OF SPILL: Historical use		DATE/TIME DISCOVERED: June 17, 2013/2:00 pm		DATE/TIME REPORTED: June 26, 2013	
INCIDENT LOCATION/ADDRESS: T 9 S, R 17 E, section 4, KRM; USS 5088		DATUM: ☐ NAD27 ☐ NAD83 ☒ WGS84 ☐ Other _____		PRODUCT SPILLED: Heating oil and potentially other chemicals	
		LAT. 64 44' 21.6"			
		LONG. -155 19' 21.0"			
QUANTITY SPILLED: unknown ☒ gallons ☐ pounds	QUANTITY CONTAINED: ☒ gallons ☐ pounds		QUANTITY RECOVERED: ☒ gallons ☐ pounds		QUANTITY DISPOSED: ☐ gallons ☐ pounds
POTENTIAL RESPONSIBLE PARTY:		OTHER PRP, IF ANY:		VESSEL NAME:	
Name/Business:		City of Ruby			
Mailing Address:		P.O. Box 90 Ruby, AK 99768		VESSEL NUMBER:	
Contact Name:		Jay DeLima, Mayor/ Jennie Peters, City Administrator		> 400 GROSS TON VESSEL:	
Contact Number:		468-4443/468-4401		☐ Yes ☐ No	
SOURCE OF SPILL: Possible spills associated with buried fuel tank on the north side of the building. Spills of unknown				CAUSE CLASSIFICATION:	
CAUSE OF SPILL: Unknown. Possibly due to use of abandoned underground storage tank and possible chemical spills in and/or under building. ☐ Under Investigation				☐ Accident ☐ Human Factors ☐ Structural/Mechanical ☒ Other	
CLEANUP ACTIONS: none					
DISPOSAL METHODS AND LOCATION:					
AFFECTED AREA SIZE: unknown		SURFACE TYPE: (gravel, asphalt, name of river etc.) developed pad		RESOURCES AFFECTED/THREATENED: (Water sources, wildlife, wells, etc.) Yukon River watershed within the Village of Ruby	
COMMENTS: There may have been multiple spills on this site. A petroleum smell is evident near a crushed (flattened) pipe reportedly at the location of an abandoned UST on the north side of the "Old Head Start Building". A local resident reported that a property owner downslope from the possible spill site discovered petroleum product when attempting to dig a basement. Report unverified.					

ADEC USE ONLY

SPILL NAME:		NAME OF DEC STAFF RESPONDING:		C-PLAN MGR NOTIFIED? ☐ Yes ☐ No	
DEC RESPONSE: ☐ Phone follow-up ☐ Field visit ☐ Took Report		CASELOAD CODE: ☐ First and Final ☐ Open/No LC ☐ LC Assigned		CLEANUP CLOSURE ACTION: ☐ NFA ☐ Monitoring ☐ Transferred to CS or STP	
COMMENTS:		Status of Case: ☐ Open ☐ Closed			
		DATE CASE CLOSED:			
REPORT PREPARED BY:		DATE:			

DNR-Lands Ruby Lease Site Visit 6/17/2013

DNR Staff: Roselynn Ressa & Patty Burns

ADEC Spill Report Attachment

There may have been multiple spills on this State-owned parcel in Ruby (see map figure). The existing building on this site is locally referred to as the "Old Head Start Building" and is owned by the City of Ruby (photographs 1 & 2). The site has a long and varied history of use and ownership. The City of Ruby is listed as the "Responsible Party" because they have been the most recent lease holder. The State is not approving the City of Ruby's application to renew the lease due to the potential contamination discovered on site during a routine site inspection on 6/17/2013.

A petroleum smell is evident near a crushed pipe reportedly at the location of an abandoned UST on the north side of the building (photographs 2 & 3). A local resident reported that a property owner downslope from the possible spill site discovered petroleum product when attempting to dig a basement. Report unverified (photograph 4).

The UST may date back to when the original Ruby school was built in 1934. The school was abandoned when the new Ruby school was built prior to 1979. Later, the City of Ruby, under a lease from the DNR, tore down several buildings. The remaining building, which may have been built later, was eventually used for the Tanana Chiefs Head Start Program. There is a strong chemical odor coming from the crawl space on the west side of the building.

It is unclear when the existing structure was built, probably before 1979. A gravel pad and roads were subsequently constructed on the site and most of the vegetation has been removed from the site. The subsurface conditions under the pad and roads around the building are unknown.



Photograph 1 View to west on the south side of the "Old Headstart Building"



Photograph 2 View to west on north side of building. Possible UST location indicated by arrow.



Photograph 3 Crushed pipe at possible UST location.



Photograph 4 View west from "Old Headstart Building" toward direction of possible contamination migration.



Photograph 5 View of crawl space from access point.

Ruby State Parcel Potential Contamination



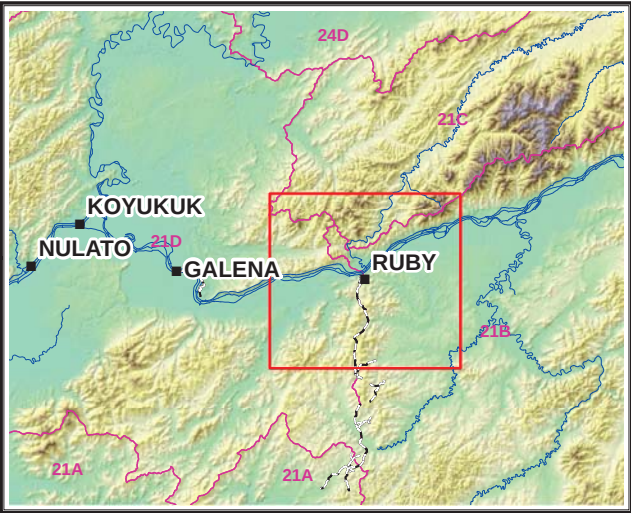
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APPENDIX B

DOYON LIMITED LAND OWNERSHIP MAP

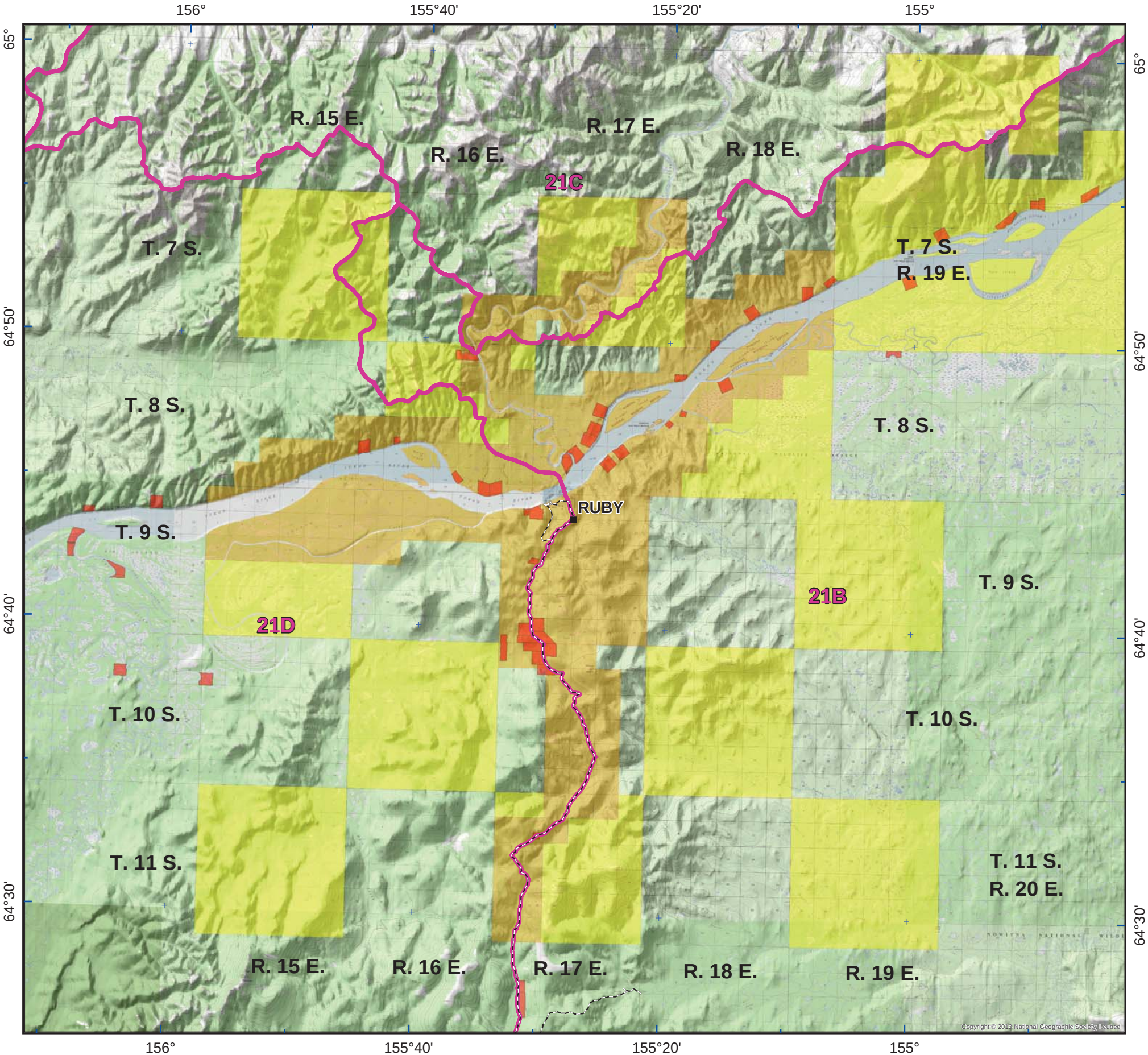
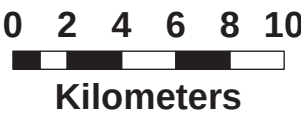
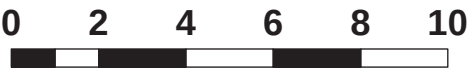
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Index Map



EXPLANATION

- Dineega Corp. Surface, Doyon Subsurface
- Doyon Surface and Subsurface
- Alaska Native Allotments
- Game Management Unit
- Roads



RUBY, ALASKA

Kateel River Meridian
Ruby Quadrangle

While Doyon Limited strives to make the information on this map as accurate as possible, because it compiles information from other sources, it cannot guaranty the accuracy or completeness of the contents and expressly disclaims liability for errors and omissions in the contents of this map.

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APPENDIX C

STATE RECORDS, WELL LOGS, AND HISTORIC PHOTOGRAPHS

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U.S. SURVEY
No. 5088, ALASKA
COMPRISING
TRACTS A, B, C, D, E, F, G & H

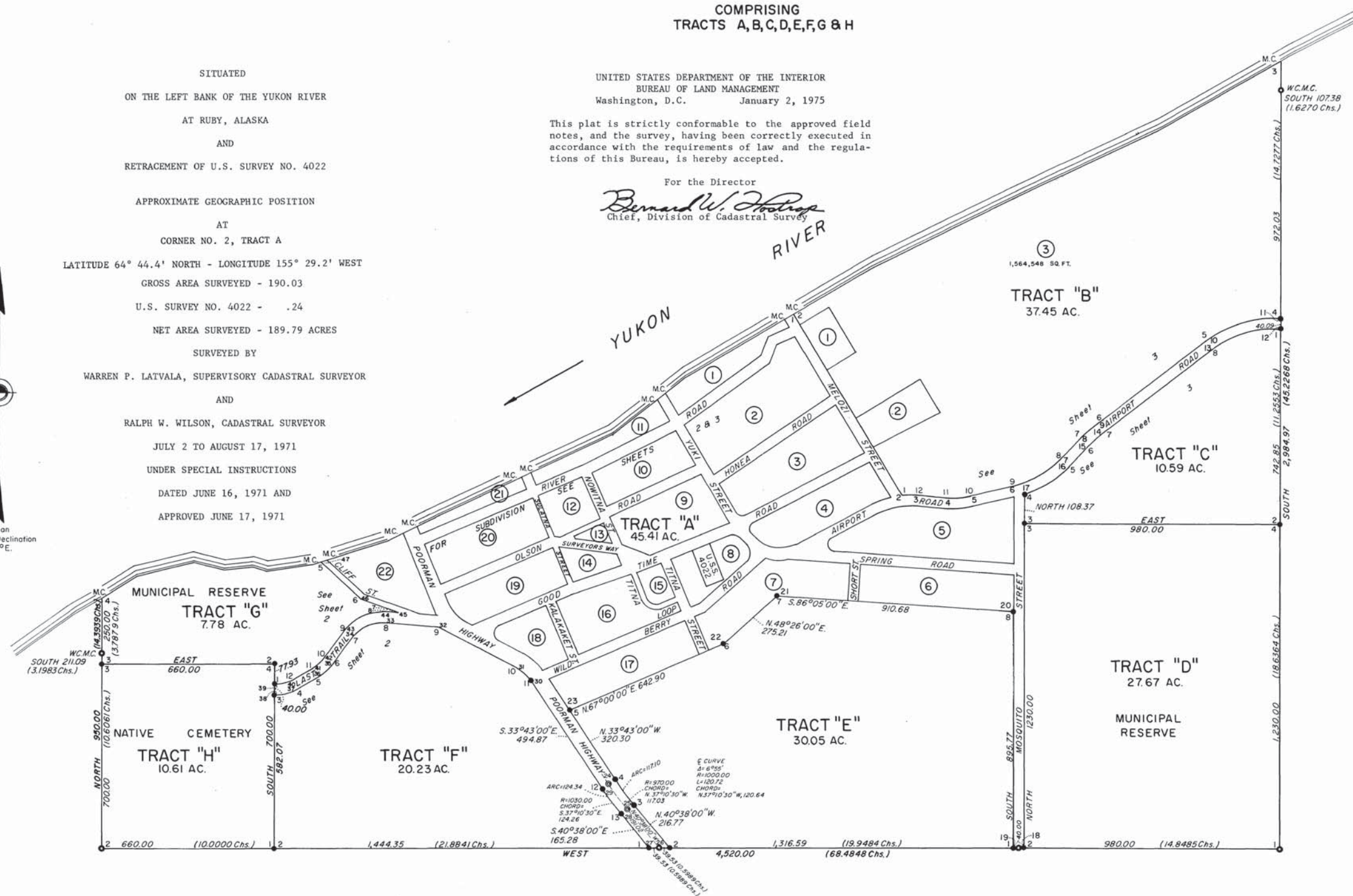
SITUATED
ON THE LEFT BANK OF THE YUKON RIVER
AT RUBY, ALASKA
AND
RETRACEMENT OF U.S. SURVEY NO. 4022

APPROXIMATE GEOGRAPHIC POSITION
AT
CORNER NO. 2, TRACT A
LATITUDE 64° 44.4' NORTH - LONGITUDE 155° 29.2' WEST
GROSS AREA SURVEYED - 190.03
U.S. SURVEY NO. 4022 - .24
NET AREA SURVEYED - 189.79 ACRES
SURVEYED BY
WARREN P. LATVALA, SUPERVISORY CADASTRAL SURVEYOR
AND
RALPH W. WILSON, CADASTRAL SURVEYOR
JULY 2 TO AUGUST 17, 1971
UNDER SPECIAL INSTRUCTIONS
DATED JUNE 16, 1971 AND
APPROVED JUNE 17, 1971

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Washington, D.C. January 2, 1975

This plat is strictly conformable to the approved field notes, and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director
Bernard W. Hoopes
Chief, Division of Cadastral Survey



● BRASS CAPPED IRON POST
● COPPERWELD MONUMENT

0 1 2 3 4 5 10
SCALE IN CHAINS

0 100 200 300 400 500 1000
SCALE IN FEET

vol. 1122 p. 64
K-10-11 Ruby (C-5)

ORIGINAL

Sheet 2 of 3 Sheets

Reference should be made to Sheet No. 1 for survey information.

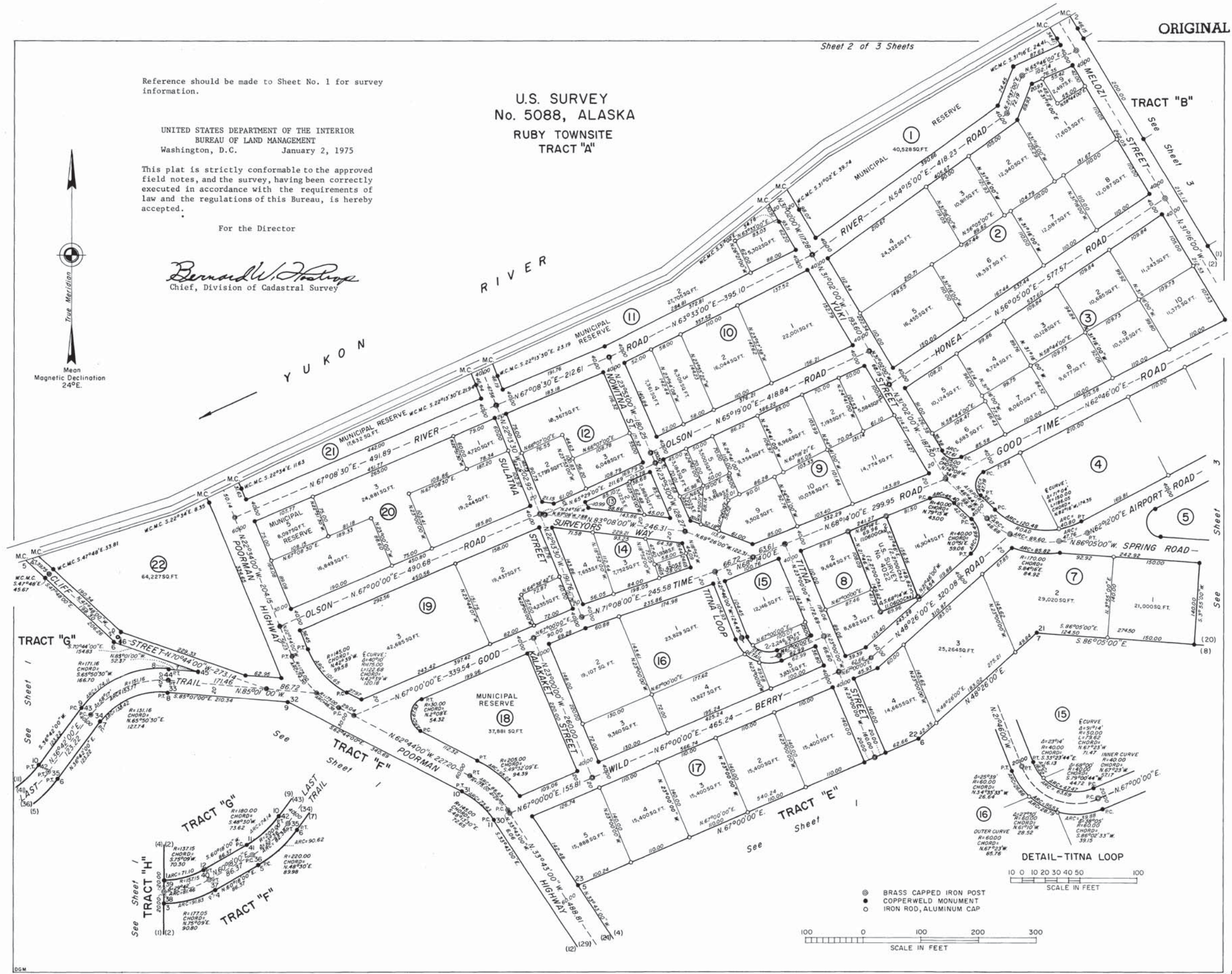
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Washington, D.C. January 2, 1975

This plat is strictly conformable to the approved field notes, and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

Bernard W. Hastings
Chief, Division of Cadastral Survey

U.S. SURVEY
No. 5088, ALASKA
RUBY TOWNSITE
TRACT "A"



- BRASS CAPPED IRON POST
- COPPERWELD MONUMENT
- IRON ROD, ALUMINUM CAP

SCALE IN FEET

DETAIL-TITNA LOOP
SCALE IN FEET

K-10-11 Ruby (C-5)

U.S. SURVEY
No. 5088, ALASKA
RUBY TOWNSITE
TRACTS "A" & "B"

Reference should be made to Sheet No. 1 for survey information.

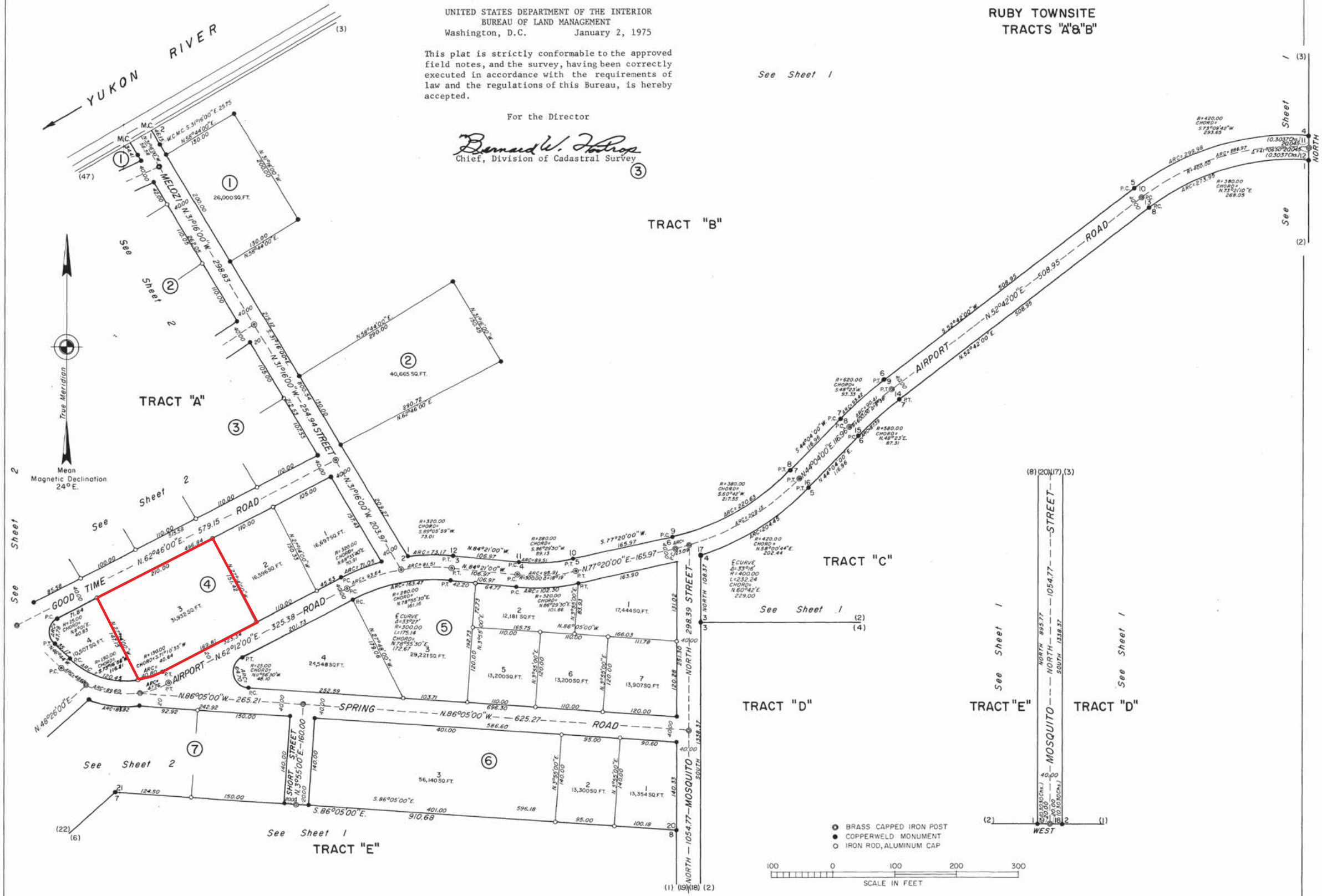
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Washington, D.C. January 2, 1975

This plat is strictly conformable to the approved field notes, and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

Bernard W. Hopkins
Chief, Division of Cadastral Survey

See Sheet 1



K-10-11 Ruby (C-5)

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Ruby

RECEIVED

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D.P.W. DIV. OF BUILDINGS
JUNEAU

September 8, 1975

George E. M. Gustafson
Townsite Trustee
Bureau of Land Management
555 Cordova Street
Anchorage, Alaska 99501

Re: F-035231, CG-78

Gentlemen:

In accordance with a letter of August 20, 1975, from Fairbanks District Office, the State is relinquishing all of State Selection Application F-035231, upon the granting of deed in the Ruby Townsite.

Enclosed is relinquishment and the application for deed.

There is a State operated school on Lot 3, Block 4, U.S.S. 5088, Tract A. We have somewhat sketchy information as to the history of the school and the application is filled out in that manner.

Thank you for your cooperation.

Sincerely,

Michael C. T. Smith
Director
MCTS:JMS:bm
cc: Paul E. Cowles
Realty Officer
Division of Buildings

cc: CG-78

ALASKA TOWNLOT DEED APPLICATION
(Act of March 3, 1891; 26 Stat. 1099; 48 U.S.C. 355)

1. Name(s) (first, middle initial, last)	Address (include zip code)
State of Alaska	323 E. 4th Avenue Anchorage, Alaska 99501

hereby applies to the Trustee for the townsite of _____, Alaska, for a deed to the following-described tract of land located in the townsite

Lot Number	Block Number	U.S. Survey Number
3	4	5038, Tract A

2. Are there improvements situated on this tract? ☒ Yes ☐ No (if "yes," describe)

School and related educational services

3. Give the history of occupancy of this tract for the past 19 years for which you have knowledge (specify to the best of your knowledge the number of years of occupancy of these lands; if others have occupied these lands during these years show the length of time and how they acquired their interest; tell how you acquired your interest)

4. I have used and occupied this tract since (date) 1956

5. I HEREBY CERTIFY That there is no one living on, or claiming an interest in, this tract other than myself and the statements made above are true, complete, and correct to the best of my knowledge and belief.

September 5, 1975

(Date)

(Signature of applicant)

Michael C. T. Smith
Director, Div. of Lands, State of Alaska

(Signature of applicant)

STATEMENT OF TWO DISINTERESTED WITNESSES

(A disinterested witness is a person who has no interest in the tract and who is not related to the applicant)

We, _____ and _____

HEREBY CERTIFY That we have read the above statements made by the applicant and, from personal knowledge, know that statements are true.

September 5, 1975

(Date)

(Signature)

September 5, 1975

(Date)

(Signature)

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

Beginning at a point in approximate, latitude sixty four degrees 43'04" N., longitude 155 degrees 27'55" W., from which the stone marking the intersection of Hill Street and Fourth Avenue in Ruby, Alaska, bears S. 68 degrees 24' W., 6.741 chs. distant.

From the initial point,

N. 65 degrees 20' E., 6 chs.

S. 24 degrees 40' E., 4 chs.,

S. 65 degrees 20' W., 6 chs.,

N. 24 degrees 40' W., 4 chs., to the place of beginning

Containing 2.4 acres

Restored by PLO 3957

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RELINQUISHMENT OF
APPLICATION, ENTRY, OR GRANT

FORM APPROVED
OMB NO. 42-R1647

Serial Number

F-035231, CG-78

Type of Case

State Selection Application

I HEREBY relinquish to the United States any and all right, title, and interest that I may have obtained by reason of the ☒ acceptance of the application for filing ☐ allowance of the entry ☐ approval of the grant by the Department of the Interior in the above-identified case insofar as
☒ all the lands described are concerned
☐ only the following-described lands are concerned

SECTION

TOWNSHIP

RANGE

SUBDIVISION

Protracted T. 8 S., R. 17 E.

See attached metes and bounds description

Meridian Kateel R.	County	State Alaska	Acres (number) 2.4
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I CERTIFY That the statements made herein are true, complete, and correct to the best of my knowledge and belief and are made in good faith.

Michael C. T. Smith
Director, Div. of Lands, State of Alaska

September 5, 1975

(Date)

(Signature)

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

INSTRUCTIONS

Submit one copy to the Bureau of Land Management Office having jurisdiction over the application, entry, or grant. For states in which no Bureau of Land Management office is located, submit as follows:

North Dakota, South Dakota
Bureau of Land Management
Billings, Montana 59101

Washington
Bureau of Land Management
Portland, Oregon 97208

Kansas, Nebraska
Bureau of Land Management
Cheyenne, Wyoming 82001

Oklahoma
Bureau of Land Management
Santa Fe, New Mexico 87501

Eastern States
Bureau of Land Management
7981 Eastern Avenue
Silver Spring, Maryland 20910

2. Identify, in upper right-hand corner, by giving serial or other identifying number. Give type of case involved such as exchange, homestead, right-of-way, etc.
3. Relinquishment is to be signed by the applicant, entryman, or grantor (lessee, licensee, permittee), or by the legal successor-in-interest.

Form 1825-3 (August 1972)

Form 1880-8
(July 1975)
Fairbanks 3917

The United States of America,

To all to whom these presents shall come, Greeting:

WHEREAS

George E. M. Gustafson, Trustee

is entitled to a Land Patent pursuant to Section 2587 of the Revised Statutes and Section 11 of the Act of March 3, 1891 (26 Stat. 1099), as amended, and Section 3 of the Act of May 25, 1926 (44 Stat. 629), and the Act of February 26, 1948 (62 Stat. 35), for Tracts A, B, C, D, E, F and G of the land embraced in U.S. Survey No. 5088, Alaska.

Containing 179.18 acres:

NOW KNOW YE, that there is, therefore, granted by the UNITED STATES, unto the said George E. M. Gustafson, Trustee, the tracts of land above described; TO HAVE AND TO HOLD said tracts with all the rights, privileges, immunities, and appurtenances of whatsoever nature, thereunto belonging, unto the said George E. M. Gustafson, Trustee, in trust for the several use and benefit of the occupants of the Townsite of Ruby, Alaska, according to their respective interests, and to his successors in trust;

EXCEPTING AND RESERVING TO THE UNITED STATES

1. A right-of-way thereon for ditches and canals constructed by the authority of the United States. Act of August 30, 1890, 26 Stat. 391; 43 U.S.C. 945;
2. A right-of-way thereon for the construction of railroads, telegraph, and telephone lines, as prescribed and directed by the Act of March 12, 1914, 38 Stat. 305; and

76-1-5
RECORDED - ~~FILED~~ the placer gold and tin mineral deposits in
Nulato, Alaska, as patented, and to it, or persons authorized
it, the right to prospect, mine, and remove such
mineral deposits from the same under applicable law.

DATE 4-8 1976

TIME 12:00 P.M.

BY BLM

555 C. Anderson

Per [Signature]

IN TESTIMONY WHEREOF, the undersigned authorized officer of the Bureau of Land Management, in accordance with the provisions of the Act of June 17, 1948 (62 Stat. 476), has, in the name of the United States, caused these letters to be made Patent, and the Seal of the Bureau to be hereunto affixed.

GIVEN under my hand, in Anchorage, Alaska
the SECOND day of APRIL in the year
of our Lord one thousand nine hundred and SEVENTY-SIX
and of the Independence of the United States the two hundredth.

By [Signature]
Chief, Branch of Lands
and Minerals Operations



Patent Number: 50-76-0151

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BOOK 3 PAGE 790
Nulato Recording District

TRUSTEE DEED

THIS INDENTURE, made this 5th day of October, in the year of our Lord one thousand nine hundred and seventy-six, by and between George E. M. Gustafson as trustee for the townsite of Ruby, U. S. Survey Number 5088, in the State of Alaska, party of the first part, and the State of Alaska of 323 E. 4th Avenue, Anchorage, Alaska, part y of the second part,

WITNESSETH, That said party of the first part, as such trustee, by virtue of the power vested in and conferred upon him by the terms of section 11 of the Act of Congress approved March 3, 1891 (26 Stat. 1095), and the regulations thereunder and the patent issued to him thereon, and in consideration of the sum of ~~XXXXXXXXXXXXXXXXXXXXXXXXXXXX~~ dollars, the amount of the assessments upon the premises hereinafter described, the receipt of which is hereby acknowledged, by these presents does grant, convey, and confirm unto the said party of the second part and its ~~XXXXXXXXXXXX~~ successors all the following lot ~~XXXXXX~~ piece ~~XXXXXX~~ and parcel ~~XXXXXX~~ of land situate in the townsite of Ruby, State of Alaska, described as follows, to-wit: Lot Three (3) Block Four (4), Tract A, as shown on the official plat of U. S. Survey 5088, Ruby Townsite, as accepted by the Chief, Division of Cadastral Survey, for the Director on January 2, 1975.

76-301
RECORDED - FEB 5 1976
Nulato, Alaska
DATE 10-12-76
TIME 2:32 PM
Required by 323 E. 4th Ave.
Cust of

According to the official plat of survey of said townsite, subject to rights and reservations in said patent expressed. To have and to hold the same, together with all and singular the tenements, hereditaments, and appurtenances thereunto belonging or in anywise appertaining, its ~~XXXXXXXXXXXX~~ successors forever.

IN WITNESS WHEREOF said party of the first part, as trustee, has hereunto set his hand and seal on the day and year first above written.

In the presence of:

W. Magnus, Jr.
George R. Schmidt

(SEAL)
George E. M. Gustafson
George E. M. Gustafson
Trustee for the townsite of Ruby, State of Alaska

STATE OF ALASKA:

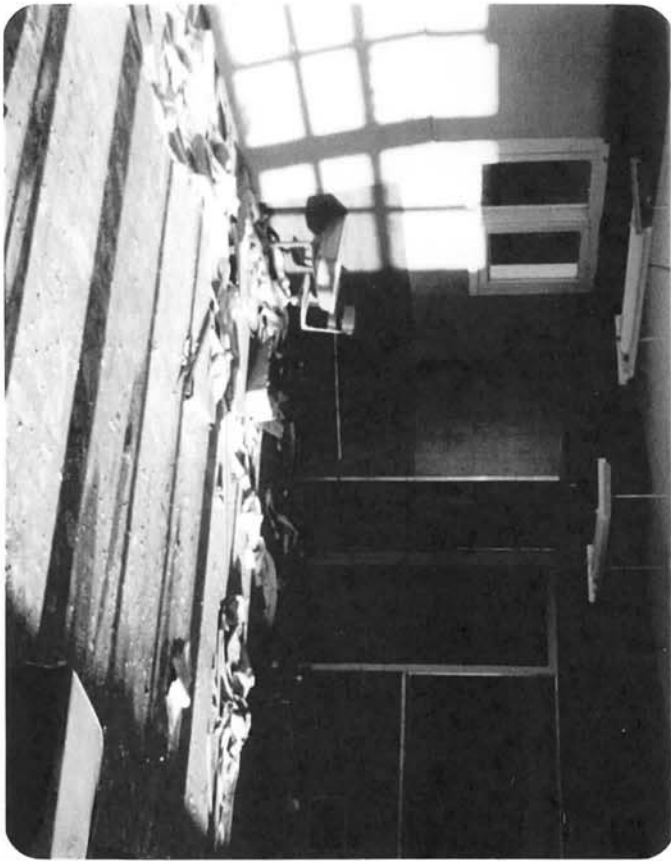
BE IT REMEMBERED, That on this 5th day of October A.D. 1976, before me, a Notary Public, came George E. M. Gustafson, to me personally known to be the trustee of said townsite of Ruby, Alaska, and the identical person described in, and whose name is affixed to, the foregoing conveyance as grantor, and he acknowledged the execution of the same to be his voluntary act and deed as such trustee, for the uses and purposes therein mentioned.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal on the day and year first above written.

(SEAL)
Kay F. Kletka
Kay F. Kletka
Notary Public for Alaska, residing at Anchorage, Alaska
My Commission expires June 4, 1978

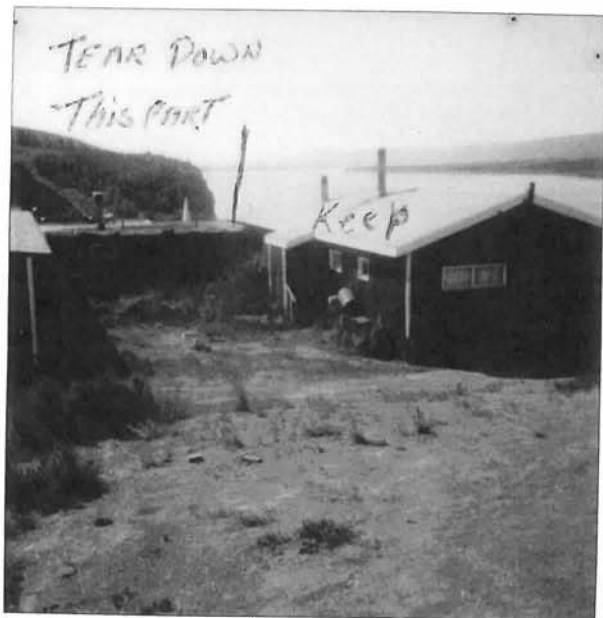
ORIGINAL







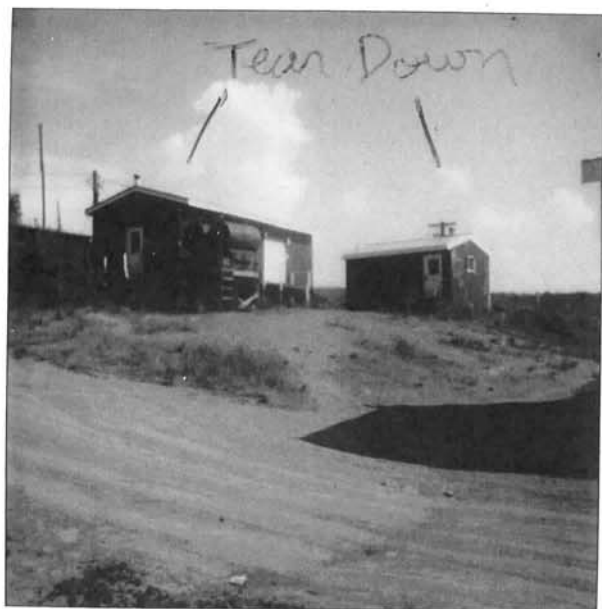
Older portion of
school building



school buildings
newer portion (right)
old portion (left)



Keep newer portion of
School building



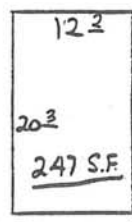
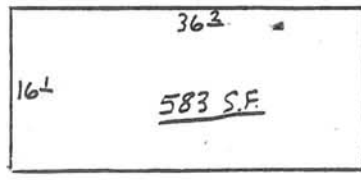
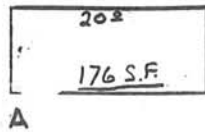
2 storage sheds
(front view)



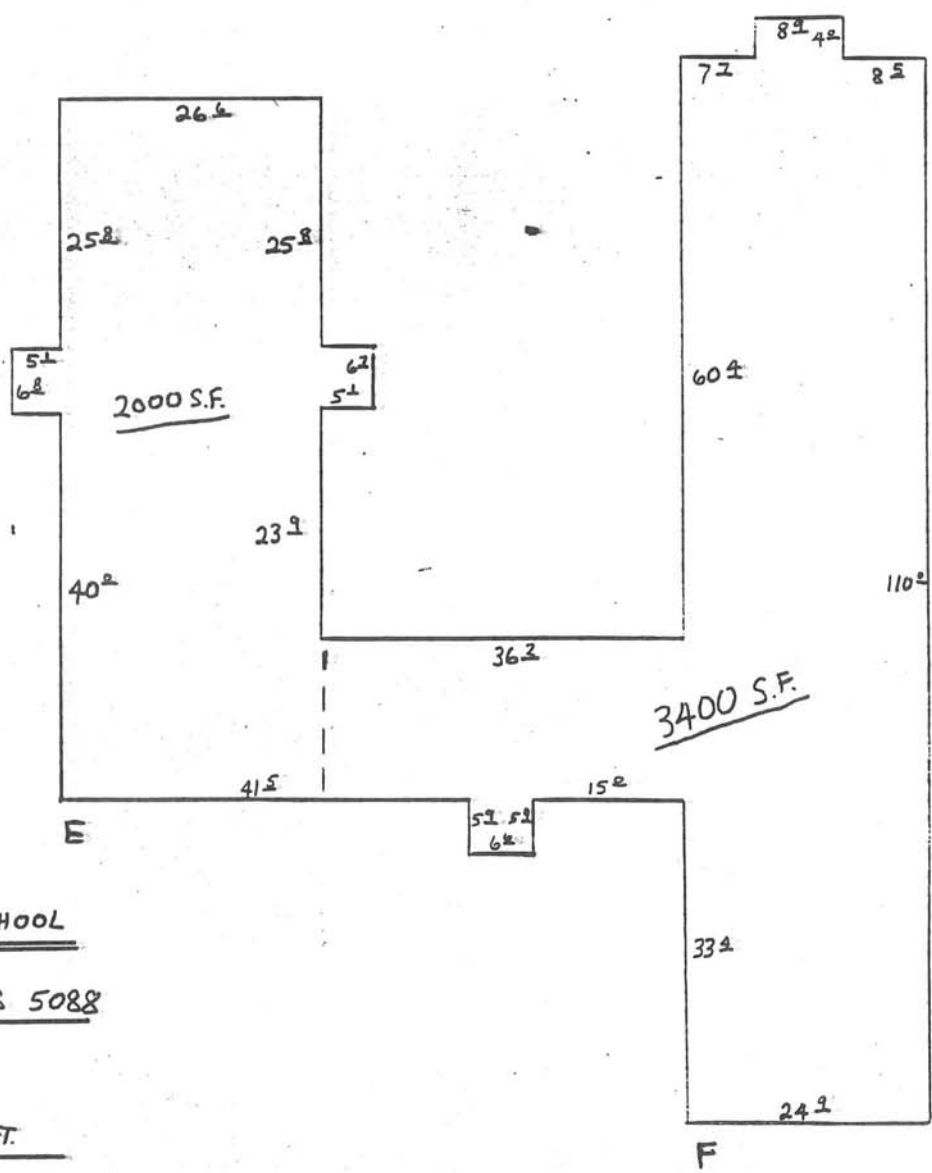
2 storage sheds
(rear view)



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- A. OUTHOUSE
- B. GENERATOR HOUSE
- C. FUEL TANK SUPPORTS
- D. STORAGE SHED
- E. SCHOOL BUILDING (NEWER)
- F. SCHOOL BUILDING (OLDER)



OLD RUBY SCHOOL
LOT 3, BLK. 4, VSS 5088

SCALE: 1" = 20 FT.

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STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FOREST, LAND AND WATER MANAGEMENT
323 East Fourth Avenue
Anchorage, Alaska 99501

ADL No. 403954

LEASE AGREEMENT

Negotiated Pursuant to AS 38.05.315

This Lease Agreement is made and entered into this 31 day of December, 1981,
between the State of Alaska, by and through the Director of the Division of Forest, Land and Water Manage-
ment with the consent and concurrence of the Commissioner of Natural Resources (hereinafter referred to as
"the Lessor"), and City of Ruby

whose address is Box 15, Ruby, Alaska 99768

(hereinafter referred to as "the Lessee").

WITNESSETH:

WHEREAS, the Lessor has undertaken the necessary administrative actions under applicable laws and
regulations to fully authorize and enable the lease of the Parcel described herein, which is acknowledged by
the Lessee by his signature hereto;

WHEREAS, the Lessee is aware of the provisions of Title 38, Alaska Statutes, Title 11, Alaska
Administrative Code, and other applicable laws, regulations, and ordinances, and fully understands the duties
and obligations of the Lessee under this Lease, and the rights and remedies of the Lessor,

NOW THEREFORE, the Lessor and the Lessee, in consideration of the mutual covenants and conditions
stated in this Lease, agree as follows:

The Lessor agrees to lease to the Lessee the following parcel of land (hereinafter referred to as "the Parcel")
which is situated in the State of Alaska and is described as follows:

Lot 3, Block 4, Tract A, USS 5088, Section 4, Township 9 South, Range 17 East,
Kateel River Meridian, containing 31,932 square feet.

EXCEPTING AND RESERVING THEREFROM, to the Lessor and its assigns during the term of this Lease, the following specific interests, which shall be in addition to and not in derogation of any general reservations to the Lessor which are required by law and which may be stated elsewhere in this Lease:

"EXHIBIT A", special conditions attached.

TO HAVE AND TO HOLD the said demised premises for a term of twenty-five (25) years commencing on the 31st day of December, 19 81 and ending at 12 o'clock midnight on the 30th day of December, ~~XXX~~ 2006, unless sooner terminated as hereinafter provided.

The Lessee shall pay to the Lessor rental as follows: Equal annual payments, in advance, on or before the 31st day of December of every year during said term at the rate of one and 00/100 dollars (\$ 1.00) per annum, such annual rental payments to be subject to adjustment following expiration of the initial 25-year period of this lease and at each 10-year period thereafter pursuant to AS 38.05 as enacted, or as may be hereafter amended.

It is agreed that the covenants, terms and agreements herein contained shall be binding upon the successors and assigns of the respective parties hereto.

THE LESSOR AND THE LESSEE FURTHER COVENANT AND AGREE AS FOLLOWS:

1. Use of Parcel. The Lessee shall use and occupy the Parcel in compliance with all applicable laws, regulations, ordinances, and orders which a public authority has promulgated or may promulgate, including those of a building or zoning authority and those relating to pollution and sanitation control. The Lessee shall not permit any unlawful occupation, business, or trade to be conducted on the Parcel. The Lessee shall properly locate himself and his improvements on the Parcel, and shall not commit waste of the Parcel, whether ameliorated or otherwise. Notwithstanding such laws, regulations, ordinances, and orders, the Lessee shall maintain the Parcel in a reasonably neat and clean condition, and take all prudent precautions to prevent or suppress pollution of the ground, surface water, air, or land, and to prevent or suppress grass, brush, or forest fires, and to prevent erosion or destruction of the land.

2. Permanent Improvements. The Lessee must within 90 days of completion of any site improvements including, but not limited to, structural improvements, clearing, leveling, excavation, and backfill, file with the Lessor adequate and reasonable documentation of such improvements, setting forth all applicable costs and quantities. Failure to provide such documentation will result in loss of credit for such improvements in determination of the original condition of the Parcel for reappraisal purposes.

3. Encumbrance of Parcel. The Lessee, during the term of this Lease, shall not encumber or cloud the Lessor's title to the Parcel, or any portion thereof, nor enter into any lease, easement, or other obligation of the Lessor's title without the prior written consent of the Lessor; and any such act or omission, without the prior written consent of the Lessor, shall be void against the Lessor.

4. Assignment of Parcel. The Lessee may not assign or sublet the Parcel, without the prior written approval of the Lessor. The Lessor may approve such assignment or subletting if the Lessor finds it to be in the best interest of the State. No assignment or subletting of the Parcel shall be approved until the assignee agrees to be subject to and governed by the provisions of this Lease in the same manner as the original Lessee. No such assignment or subletting will be effective until approved by the Lessor in writing. No assignment or subletting of the Parcel, or any portion thereof, by the Lessee shall annul the Lessee's obligation to pay the rent herein required for the full term of this lease. Except as provided in this lease, no subdivision of the leasehold interest, including any exposed airspace thereon, shall occur.

5. Denial of Warranty Regarding Conditions. The Lessor makes no warranty, express or implied, nor assumes any liability whatsoever, regarding the social, economic, or environmental aspects of the Parcel, to include, without limitation, the soil conditions, water drainage, natural or artificial hazards which may exist, or the profitability or fitness of the Parcel for any use.

6. Agreement to Terms of Lease Documents. (a) The Lessor and the Lessee agree and recognize that each of the covenants and conditions in this Lease and any attachments thereto are merged and incorporated into this agreement and shall be binding upon themselves and upon their respective successors and assigns and shall inure to their benefit. The Lessor and the Lessee further agree and recognize that this Lease shall be conditioned upon satisfactory performance by the Lessor and the Lessee of all covenants contained herein.

(b) If all or part of said Parcel has been tentatively approved, but not yet patented, by the United States to the Lessor, then this Lease shall be conditioned upon receipt by the Lessor of such patent. If for any reason the Lessor does not receive patent, any rental payments made to the Lessor under this Lease will not be refunded. Any prepaid lease rentals on lands to which patent is denied the Lessor shall be refunded to the Lessee of record and any properly recorded lienholder, if any, jointly. The money refunded shall, however, be limited to the prorata portion of the unexpired term. The Lessor shall have no further liability to the Lessee for the termination of the Lease.

7. Payment of Taxes and Assessments. The Lessee shall pay all taxes and assessments accruing against the Parcel during the term of the Lease.

8. Right-of-Way for Public Highways and Utilities. In the event that the Parcel borders or includes one or more section lines, the Lessor hereby expressly reserves unto itself and its successors and assigns a right-of-way 100 feet wide and centered on such section line or lines.

9. Navigable and Public Waters. The Lessor reserves an easement 50 feet wide for public access along the mean high water line or ordinary high water mark of all water bodies listed in this Lease which are bordering on or included within the Parcel. Public easements to and along listed water bodies are reserved for all of those uses and purposes normally associated with or incident to an easement for access to the public resources of the water body to and along which the easement has been reserved. No public access easement may be obstructed or otherwise rendered by the Lessee incapable of reasonable use by the public for the purposes for which it was reserved. No public access easement may be vacated, abandoned, or extinguished without approval of the Lessor.

10. Reservation of Easements. The Lessor expressly reserves the right to take for the use of the State of Alaska and the right to grant to third parties, easements or rights-of-way of unlimited size across the Parcel herein leased if it is determined to be in the best interests of the State to do so, even though the creation of the easement or right-of-way terminates the entire leasehold estate; provided, however, that the Lessee shall be entitled to compensation for all improvements or crops which are damaged or destroyed as a direct result of such easement or right-of-way.

11. Condemnation of Leasehold or Improvements. With the exception of the taking of easements or rights-of-way which is governed by paragraph 10 above, if the whole or any part of the Parcel is taken by any authorized body or person vested with the power of eminent domain, by negotiation, court action, or otherwise, the following provisions control:

(a) Taking of the entire premises. If all of the premises are taken by condemnation, the terms of the Lease and all rights of the Lessee will immediately terminate, and the rent must be adjusted so that it is due only until the date the Lessee is required to surrender possession of the premises. The Lessor is entitled to all the condemnation proceeds, except that the Lessee will be paid the portion of the proceeds attributable to the fair market value of the buildings or improvements placed on the condemned premises by the Lessee.

(b) Taking of substantial part of premises. If the taking is of a substantial part of premises, the following rules apply:

(1) If the taking by condemnation reduces the ground area of the Parcel by at least 30 percent or materially affects the use being made by the Lessee of the Parcel, the Lessee has the right to elect to terminate or not to terminate the Lease by written notice to the Lessor not later than 180 days after the date of taking.

(2) If the Lessee elects to terminate, the provisions in (a) of this subsection govern the condemned portion of the Parcel and the terms of the Lease govern disposal of the remainder of any buildings or improvements made by the Lessee.

(3) If the Lessee elects not to terminate, the Lease continues and the Lessor is entitled to the full condemnation proceeds except the portion attributable to the fair market value of the buildings or improvements placed on the condemned portion of the premises by the Lessee. Rent at the existing rate will terminate on the date of taking. Except as it may be adjusted from time to time under the terms of the Lease and applicable statutes, rent for the balance of the term will be adjusted by the Lessor to reflect the taking.

(c) Taking of insubstantial part of premises. If the taking by condemnation reduces the ground area of the Parcel by less than 30 percent and the Lessor determines that the taking is of such an insubstantial portion that the Lessee's use of the Parcel is not materially affected, the provisions of (b)(3) of this subsection will govern.

12. Access. The Lessor makes no representations or warranty that it will construct or maintain access to the Parcel.

13. Valid Existing Rights. This Lease is entered into and made subject to all valid existing rights, including easements, rights-of-way, reservations, or other interests in land in existence on the date of execution of this Lease.

14. Inspection. The Lessor shall have reasonable access to the Parcel for purposes of inspection regarding the faithful performance of the covenants and conditions of this Lease and for the performance of other lawful requirements.

15. Mineral Reservations. The Lessor hereby expressly saves, excepts, and reserves out of the grant hereby made, unto itself, its lessees, successors, and assigns forever, all oils, gases, coal, ores, minerals, fissionable materials, geothermal resources, and fossils of every name, kind or description, and which may be in or upon said lands above described, or any part thereof, and the right to explore the same for such oils, gases, coal, ores, minerals, fissionable materials, geothermal resources, and fossils. The Lessor also hereby expressly saves and reserves out of the grant hereby made, unto itself, its lessees, successors, and assigns forever, the right to enter by itself, its or their agents, attorneys, and servants upon said lands, or any part or parts thereof, at any and all times, for the purpose of opening, developing, drilling and working mines or wells on these or other lands and taking out and removing therefrom all such oils, gases, coal, ores, minerals, fissionable materials, geothermal resources, and fossils, and to that end it further expressly reserves out of the grant hereby made, unto itself, its lessees, successors, and assigns forever, the right by its or their agents, servants and attorneys at any and all times to erect, construct, maintain, and use all such buildings, machinery, roads, pipelines, powerlines, and railroads, sink such shafts, drill such wells, remove such soil, and to remain on said lands or any part thereof for the foregoing purposes and to occupy as much of said lands as may be necessary or convenient for such purposes, hereby expressly reserving to itself, its lessees, successors, and assigns, as aforesaid, generally all rights and power in, to and over said land, whether herein expressed or not, reasonably necessary or convenient to render beneficial and efficient the complete enjoyment of the property and rights hereby expressly reserved.

Provided, however, that no rights reserved hereunder shall be exercised by the Lessor or its subsurface lessees, until provision has been made by the Lessor or its subsurface lessees to pay to the Lessee of the land upon which the rights are herein reserved, full payment for all damages sustained by said Lessee by reason of entering upon said land; and provided that, if said Lessee for any cause whatever refuses or neglects to settle said damages, the Lessor or its subsurface lessees, or any applicant for a subsurface lease, contract or option from the Lessor or its subsurface lessee for the purpose of exploring for or extracting valuable minerals, coal, petroleum, natural gas, or geothermal resources shall have the right, after posting a surety bond with the Lessor issued by a corporation qualified to do business in Alaska and licensed to sell insurance in Alaska, or after posting with the Lessor a sufficient bond executed by one or more individual sureties approved by the Lessor and after due notice and an opportunity to be heard, to exercise rights granted to it for reasonable use of the surface required for the full enjoyment of the reserved subsurface rights which it holds. Each surety bond shall be sufficient in amount and security to secure the affected rights of the surface Lessee, and such Lessee and the Lessor or its subsurface lessee shall have the standing which may be necessary to determine the damages which the surface Lessee of such lands may suffer, and the security appropriate to hold the surface Lessee harmless in relation thereto.

16. Surface Reservations. Unless otherwise stated in this Lease or in an attachment or amendment hereto, the Lessee shall not sell or remove for use elsewhere any of the surface resources of the parcel, e.g., stone, gravel, sand, peat, topsoil, timber, or any other material valuable for building or commercial purposes; provided, however, the Lessee may make reasonable personal use of such materials on the site.

17. Appropriation or Disturbance of Waters. (a) During the term of this Lease, the Lessee shall have the right to apply for an appropriation of ground or surface water on the Parcel in accordance with the Alaska Water Use Act. All water applied for and appropriated during the term of this Lease shall remain appurtenant to the Parcel during said term, and such water and water rights shall not be severed or transferred from the Parcel or any part thereof during said term without the prior consent of the Lessor. The Lessee's rights under any permit or certificate of appropriation shall revert to the Lessor upon termination of the Lease or forfeiture of the Lease for cause.

(b) If the Lessee desires to use the Parcel to construct any form of hydraulic project or employ any equipment or engage in any activity which will use, divert, obstruct, pollute, or change the natural flow or bed of any anadromous fish river, lake or stream, the Lessee shall, prior to the commencement of any such operation, procure the approval of the Commissioner of the Department of Fish and Game.

18. Acquisition of Rights or Interests. Any right or interest acquired during the term of this Lease and accruing to the benefit of the Parcel shall remain appurtenant to the Parcel during that term, and shall not be severed or transferred from the Parcel without the prior consent of the Lessor. In the event of termination or forfeiture of this Lease, any such right or interest shall revert to the Lessor along with the Parcel.
19. Land Alterations Due to Natural or Artificial Causes. The Parcel described herein shall constitute the entire Parcel of property to be leased by the Lessor to the Lessee pursuant to this agreement. If, through natural or artificial causes, accretion or reliction of land occurs contiguous to the Parcel, the Lessee shall have no right to occupy or use such accreted land unless a separate lease is entered with the Lessor with respect to such lands. The parties agree and stipulate that the rules of law usually applicable to accretion or reliction of land shall not apply to this Lease, nor to the Parcel leased hereunder, in order that the parties may give effect to the provision agreed upon herein.
20. Waiver or Forebearance. The receipt of rent by the Lessor, with or without knowledge of any breach of the Lease by the Lessee, or of any default on the part of the Lessee in the observance or performance of any of the terms, conditions or covenants of this Lease, shall not be deemed to be a waiver of any provision of this Lease. No failure on the part of the Lessor to enforce a condition or covenant of this Lease, nor the waiver of any right hereunder by the Lessor, unless in writing, shall discharge or invalidate the application of such term or covenant; nor shall any forbearance or written waiver affect the right of the Lessor to enforce any term or covenant in the event of any subsequent breach or default. The receipt by the Lessor of rent or any other sum of money, or the termination in any manner of the Lease, or the giving by the Lessor of any notice hereunder to effect such termination, shall not reinstate, continue, or extend this Lease nor destroy or in any manner impair the validity of any such notice of termination which may have been given hereunder by the Lessor to the Lessee prior to the receipt of any such sum of money or other consideration, unless the contrary effect shall be expressed in writing and signed by the Lessor.
21. Breach and Remedies. (a) Time is of the essence in the Lease Agreement. If the Lessee shall breach the performance of any of the terms, covenants, conditions or stipulations contained herein or attached hereto, and said breach shall not be remedied within 60 days after written notice of such breach has been served upon the Lessee and the holder of a security interest by the Lessor, the Lessee shall be subject to such legal action as the Lessor shall deem appropriate, including, but not limited to, the termination of this Lease, provided that no improvements now upon the Parcel, or which may be placed thereon during the term of this Lease, may be removed therefrom during any time in which the Lease may be in breach. In the event that this Lease is terminated for breach of any of the covenants or conditions contained herein or attached hereto, all rents paid by the Lessee shall be forfeited to and retained by the Lessor not as a penalty but as liquidated damages. The Lessor shall not be liable for any expenditures made by the Lessee or undertaken by the Lessee under this Lease prior to termination.
- (b) If the Lessee fails to cure or remedy a breach of default within the time allowed in (a) of this paragraph, the holder of a security interest who has received notice under (a) of this paragraph may cure or remedy the breach or default if the breach or default can be cured by the payment of money or, if this cannot be done, by performing or undertaking in writing to perform the terms, covenants, restrictions and conditions of the lease capable of performance by the holder. The holder shall act within 60 days from the date of receipt of notice under (a) of this paragraph, or within any additional period which the Lessor may allow for good cause.
- (c) In the event that this Lease is terminated, or in the event that the Parcel, or any part thereof is abandoned by the Lessee during the term of this Lease, the Lessor may immediately, or at any time thereafter, enter or re-enter and take possession of said Parcel, or any part thereof, and without liability for any damage therefor, remove all persons and property therefrom either by summary proceedings or by suitable action at law; provided, however, that the words "enter" and "re-enter" as used herein are not restricted to their

technical legal meaning. Any entry or re-entry, possession, repossession, or dispossession by the Lessor, whether taken by summary proceedings or otherwise, shall not be deemed to absolve, relieve, release or discharge the Lessee, either in whole or part, for any monetary liability under the Lease.

22. Disposition of Improvements and Chattels After Termination. (a) The Lessee shall, within 60 days after termination of the Lease by the Lessor or by operation of law, remove all improvements and chattels located on the Parcel, provided that the Lessor first determines that such removal will not cause injury or damage to the Parcel or seriously impair its redispisal. Following such removal, the Lessee shall leave the Parcel in a safe and clean condition acceptable to the Lessor. The Lessor may, in its discretion, extend the time for removal of improvements under this subparagraph where undue hardship is demonstrated.

(b) If any improvements or chattels having an appraised value exceeding \$10,000.00, as determined by the Lessor, are not removed from the Parcel within the time allowed, they shall, upon 30 days prior written notice to the Lessee, be sold at public auction under the direction of the Lessor. The proceeds of sale shall inure to the Lessee who placed the improvements or chattels on the land, after deduction for the benefit of the Lessor of all monies due and owing under this Lease and all expenses incurred in administering the termination and conducting the sale. If there are no other bidders at such sale, the Lessor is authorized to bid on such improvements or chattels. In such event, the Lessor shall acquire all rights, both legal and equitable, which any other purchaser could acquire by reason of said sale and purchase.

(c) Any chattels or improvements having a total appraised value of \$10,000.00 or less, as determined by the Lessor, and which are authorized for removal by the Lessor but are not removed within the time allowed, shall become the absolute property of the Lessor upon the expiration of the time allowed.

(d) Authorized improvements of the Lessee which the Lessor determines have become fixtures of the Parcel shall be purchased by the subsequent purchaser or lessee. There will be no compensation to the Lessee for improvements which were not authorized under the Lease.

23. Indemnity to Lessor. During the term of the Lease the Lessee shall indemnify and hold the Lessor harmless from and against all claims and demands for loss or damage, including property damage, personal injury, wrongful death, and wage or employment claims, arising out of or in connection with the use or occupancy of the Parcel by the Lessee or by any other person holding under the Lessee, or at its sufferance or invitation; and from any accident or fire on the Parcel; and from any nuisance made or suffered thereon; and from any failure by the Lessee to keep the Parcel in a safe and lawful condition consistent with applicable laws, regulations, ordinances, or orders; and from any assignment, sublease, or conveyance, attempted or successful, by the Lessee of the Parcel or any part thereof or interest therein contrary to the conditions and covenants of this Lease. The Lessee will hold all goods, materials, furniture, fixtures, equipment, machinery and other property whatsoever on the Parcel at the sole risk of the Lessee, and will save the Lessor harmless from any claim of loss or damage thereto by any cause whatsoever.

24. Surrender of Leasehold. Upon the expiration, termination or cancellation of this Lease the Lessee shall quietly and peaceably leave, surrender and yield up unto the Lessor all of the Parcel.

25. Notices. All notices required or permitted under this Lease Agreement shall be made by certified mail, postage prepaid, to the parties at the following addresses:

To the Lessor: Alaska Division of Forest, Land and Water Management
 323 East Fourth Avenue
 Anchorage, Alaska 99501

To the Lessee: City of Ruby
 Box 15
 Ruby, Alaska 99768

Any notice or demand which must be given or made by the Lessor or the Lessee shall be in writing and shall be complete if sent by United States certified mail to the address shown in the Lease Agreement, or to such other address as each of the parties may designate in writing from time to time. A copy of any such notice shall be forwarded to the Lessor, and to the holder of any security interest in the Parcel who has properly recorded its interest in the Lease with the Lessor.

26. Service Charges. The Lessee shall pay a service charge for any late payment or returned check issued by it as follows:

(a) Late Payment Penalty: A service charge plus annual interest (twice the interest rate charged on installment payments at the prevailing rate for real estate mortgage loans made by the Federal Land Bank for the farm credit district for Alaska) on the amount due will be charged on a past-due account until payment is received by the Lessor or until the Lease Agreement termination date is reached. Acceptance of a late payment or of a service charge for a late payment is subject to the Lessor's rights under paragraphs 20 and 21 of this Lease.

(b) Returned Check Penalty: A service charge of \$10.00 will be assessed for any check on which the bank refuses payment. If the bank refuses payment, the default termination date remains the same. Late penalties under (a) of this paragraph shall continue to accumulate.

27. Integration and Modification. This Lease, including all attachments and documents which by reference are incorporated herein or made a part hereof, contains the entire agreement between the parties hereto.

This lease may not be modified or amended except by a document signed by both parties hereto, and any purported amendment or modification shall be without legal effect until reduced to writing and signed by both parties hereto.

28. Severability of Clauses of Lease Agreement. If any clause, or provision, herein contained, shall be adjudged to be invalid, it shall not affect the validity of any other clause or provision of this Lease or constitute any cause of action in favor of either party as against the other.

IN WITNESS WHEREOF the State of Alaska, as Lessor, acting through the Director of the Division of Forest, Land and Water Management of the Department of Natural Resources or his lawfully-designated representative, and otherwise being lawfully authorized, and the Lessee have caused these presents to be executed in duplicate, and have hereunto set their respective hands, agreeing to keep, observe and perform the applicable statutes, as amended, the rules and regulations promulgated thereunder, and the terms, conditions and provisions herein contained or attached, which on the Lessor's or the Lessee's respective parts are to be kept, observed and performed.

LESSEE:

Don W. Hansen
Vice-Mayor

LESSOR:

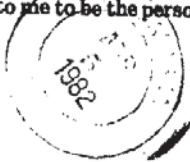
Don J. Brown
DIRECTOR
Division of Forest, Land and Water Management

APPROVED:

W. H. Hargrave
COMMISSIONER
Department of Natural Resources

STATE OF ALASKA)
) ss.
____ Judicial District)

THIS IS TO CERTIFY that on this 5th day of April, 19 82,
before me appeared Kendra McCarty, Vice-Mayor, to me known
and known to me to be the person named in and who executed the Lease and acknowledged voluntarily signing
the same.



Kendra McCarty Postmaster
Notary Public in and for the State of Alaska
My Commission expires: _____

STATE OF ALASKA)
) ss.
Third Judicial District)

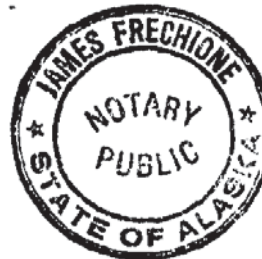
THIS IS TO CERTIFY THAT on this 9th day of April, 19 82,
before me personally appeared Jerry L. Brossie, District Manager, NCOO of the Division
of Forest, Land and Water Management of the Department of Natural Resources of the State of Alaska, who
executed the foregoing Lease and acknowledged voluntarily signing the same.

James Frechione
Notary Public in and for the State of Alaska
My Commission expires: May 10, 1983

APPROVED AS TO FORM:

Barbara J. Miasale
Assistant Attorney General

Date: 7/3/80



ADL 403954
AS 38.05.315 LEASE, City of Ruby

EXHIBIT A

Special Stipulations:

- 1) Lease is conditioned upon unrestricted public use and access. Failure to comply with this condition shall cause the property to revert to the lessor.
- 2) The lessee shall maintain the site and shall sell, remove, raze, or repair any structure or improvement on the subject property that may be hazardous to the safety, health and welfare of the general public.

All monies generated from the buildings are to be utilized for the benefit of the public use of the leased property.
- 3) Lease is subject to review every five years for the Director's determination under AS 38.05.035(a)(14) that the highest and best use of the subject property is being served. The lease may be cancelled after one year notice, if Director determines that the highest and best use is not being served.
- 4) Lessee shall submit plans to construct permanent improvements to the Director for his approval prior to the actual construction of proposed improvements. (This special condition amends time requirement in standard lease covenant #2, page 2 of the lease document.)

84

RECORDED - FILED	NC
Nulato	REG. DIST.
DATE	2/24/98
TIME	12:07 P.M.
Requested by	AS/DOL
Address	

RETURN TO: Susan Malen
State of Alaska, DNR, DOL
3700 Airport Way
Fairbanks, AK 99709



1916 Photo of Ruby



1917 Photo of Ruby



1917 Photo of the Territorial School in Ruby



1934 Photo of Territorial School Additions Under Construction



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINING, LAND & WATER

1332

WATER WELL LOG

Drilling Started: ____/____/____ Completed: 3 / 11 / 1982

City/Borough:	Subdivision:	Block	Lot	Property Owner Name & Address:
Ruby				DINEEGA CORPORATION

Latitude _____ Longitude _____
Meridian K _____ Township 009S Range 017E Section 4 _____, _____ 1/4 of _____ 1/4 of _____ 1/4 of _____ 1/4

BOREHOLE DATA: (from ground surface)
Suggest T.M. Hanna's hydrogeologic classification system *
<https://info.ngwa.org/servicecenter/shopper/ProductDetail.cfm?ProdCompanyPassed=ngw&ProdCdPassed=ngw-t1030>

Drilling method: ☐ Air rotary, ☐ Cable tool, ☐ Other _____
Well use: ☐ Public supply, ☐ Domestic, ☐ Reinjection, ☐ Hydrofracking
Fluids used: _____
☐ Other _____

Depth
From To

Depth of hole: 128 ft, Casing stickup: _____ ft
Casing type: _____ Thickness _____ inches
Casing diameter: _____ inches Casing depth _____ ft
Liner type: _____ Diameter: _____ inches Depth: _____ ft

Static water (from top of casing): _____ ft on ____/____/____
Pumping level & yield: _____ feet after _____ hours at _____ gpm
Recovery rate: _____ gpm, Method of testing: _____
Development method: _____ Duration: _____

Well intake opening type: ☐ Open end, ☐ Open hole, ☐ Other
☐ Screened; Start: _____ ft, Stopped _____ ft
Screen type: _____ Slot/mesh size _____
☐ Perforated; Start: _____ ft, Stopped _____ ft
Start: _____ ft, Stopped _____ ft
Gravel packed ☐ Yes ☐ No From _____ ft, To _____ ft
Note: _____

Grout type: _____ Volume _____
Depth: From _____ ft, To _____ ft

Pump intake depth: _____ ft
Pump size _____ hp Brand name _____

Was well disinfected upon completion? ☐ Yes ☐ No
Method of disinfection: _____
Was water quality tested? ☐ Yes ☐ No
Water quality parameters tested: _____

Well driller name: _____
Company name: LEGEND DRILLING
Mailing address: _____
City: _____ State: AK Zip _____
Phone number : (_____) _____ - _____
Driller's signature: _____
Date: ____/____/____

AS 41.08.020(b)(4) and AAC 11 AAC 93.140(a) require that a copy of the well log be forwarded to the Department of Natural Resources within 45 days of well completion. Please email well logs to:

dnr.water.reports@alaska.gov OR send to

Alaska DNR, MLW, Alaska Hydrologic Survey
550 West 7th Avenue, Suite 1020
Anchorage, AK 99501

Anchorage Municipal Code 15.55.060(l) requires that a copy of this well log be forwarded to the Development Services Department within 30 days of well completion.

City Permit Number: _____
Date of Issue: ____/____/____

Parcel Identification Number: _____ - _____ - _____

Is well located at approved permit location? ☐ Yes ☐ No

RECEIVED

JUN 4 1982

Div. Of Geological Survey Anchorage

WATER WELL RECORD
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
Division of Geological & Geophysical Surveys

LOCATION OF WELL (Please complete either 1a, 1b or 1c.)

Drilling Permit No. _____
A.D.L. No. _____

1a. Borough		Subdivision		Lot	Block	1b. 1/4 qtrs. — of — of — of —	Section No.	Township N ☐ S ☐	Range E ☐ W ☐	Meridian 155° 29' W 64° 44' N	
1c. DISTANCE AND DIRECTION FROM ROAD INTERSECTIONS NEXT DOOR TO CATHOLIC Church						3. OWNER OF WELL: Dineaga Corp. Address: Ruby, AK T9S R17E KAT RIV. MER.					
2. WELL LOG						4. WELL DEPTH: (final) 128 ft.		5. DATE OF COMPLETION 3 - 11 - 82			
Material Type						Feet Below Surface Top Bottom		6. ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Auger ☐ Jetted ☐ Bored ☐ Other:			
Fill						0 8		7. USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Recharge ☐ Commercial ☐ Test Well ☐ Other:			
fine gravel/yellow clay						8 60		8. CASING: ☐ Threaded ☐ Welded PVC diam. 4 in. to 125 ft. Depth Weight _____ lbs./ft. diam. _____ in. to _____ ft. Depth Stickup 1 1/2 ft.			
coarse gravel						60 70		9. FINISH OF WELL: 4.010 Johnson 2 1/2" / 125-128 Type: PVC Diameter: 4" Slot/Mesh Size: .012 Length: 10' Set between 115 ft. and 125 ft. Backfilling _____ Gravel pack _____			
fine gravel & yellow clay						70 110		10. STATIC WATER LEVEL: 110 ft. 3/11/82 ☐ Above or ☒ Below land surface Date Equipment used: Johnson Watermarker			
fine gravel (aquifer)						110 128		11. PUMPING LEVEL below land surface and YIELD, 124 ft. after 10 hrs. pumping 23 g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.			
								12. GROUTING Well Grouted: ☒ Yes ☐ No Material: ☒ Neat Cement ☐ Other:			
								13. PUMP: (if available) HP 3/4 Length of Drop Pipe 123 ft. capacity 13 g.p.m. ☒ Subm. ☐ Jet ☐ Centrifical ☐ Other			
								14. REMARKS: This pump to be replaced by deep well jet.			
16. WATER WELL CONTRACTOR'S CERTIFICATION:								15. Water Temperature _____° ☐ F ☐ C			
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief;											
Legend Drill Service						AA 8763					
Registered Business Name						Contract License Number					
Address: Box 65, Galena, AK 99741											
Signed: John Sander						Date: 4/11/82					
Authorized Representative											



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINING, LAND & WATER

41433

WATER WELL LOG

Drilling Started: ____/____/____ Completed: 9 / 26 / 1984

City/Borough:	Subdivision:	Block	Lot	Property Owner Name & Address:
RUBY				YUKON KOYUKUK SCHOOL DISTRICT YUKON KOYUKUK SCHOOL DISTRICT , AK
Latitude _____ Longitude _____ Meridian S _____ Township 009S Range 017E Section _____, _____ 1/4 of _____ 1/4 of _____ 1/4 of _____ 1/4				
BOREHOLE DATA: (from ground surface) Suggest T.M. Hanna's hydrogeologic classification system * https://info.ngwa.org/servicecenter/shopper/ProductDetail.cfm?ProdCompanyPassed=ngw&ProdCdPassed=ngw-t1030				Drilling method: ☐ Air rotary, ☐ Cable tool, ☐ Other _____ Well use: ☐ Public supply, ☐ Domestic, ☐ Reinjection, ☐ Hydrofracking Fluids used: _____ ☐ Other _____
Depth From To				
SANDY CLAY	0.0	13.0	Depth of hole: 598 _____ ft, Casing stickup: _____ ft Casing type: STEEL Thickness _____ inches Casing diameter: 6 _____ inches Casing depth 173.3 _____ ft Liner type: _____ Diameter: _____ inches Depth: _____ ft	
SANDY COBBLE GRAVEL: LARGE COBBLES, DARK GRAY	13.0	137.0	Static water (from top of casing): 40 _____ ft on ____/____/____ Pumping level & yield: 198 _____ feet after 16 _____ hours at 2.5 _____ gpm Recovery rate: _____ gpm, Method of testing: _____ Development method: _____ Duration: _____	
LIMESTONE	137.0	139.0	Well intake opening type: ☐ Open end, ☐ Open hole, ☐ Other ☒ Screened; Start: 0 _____ ft, Stopped 312 _____ ft Screen type: 4 INCH PVC LINER Slot/mesh size .375 _____	
SANDY CLAYSTONE	139.0	158.0	☐ Perforated; Start: _____ ft, Stopped _____ ft Start: _____ ft, Stopped _____ ft Gravel packed ☐ Yes ☒ No From _____ ft, To _____ ft Note: _____	
GRAY SILTSTONE, WATER BEARING	158.0	206.0	Grout type: _____ Volume _____ Depth: From _____ ft, To _____ ft	
SOFT SHALE: FRACTURE ZONE AT 310	206.0	310.0	Pump intake depth: _____ ft Pump size _____ hp Brand name _____	
DARK GRAY TO BLACK SILTSTONE: FIRM TO HARD, FRACTURES AT 493	310.0	598.0	Was well disinfected upon completion? ☐ Yes ☐ No Method of disinfection: _____ Was water quality tested? ☐ Yes ☐ No Water quality parameters tested: _____	
			Well driller name: _____ Company name: M-W DRILLING Mailing address: 12200 AVION ST City: ANCHORAGE State: AK Zip 99516 Phone number : (907) 345 - 4000 Driller's signature: _____ Date: ____/____/____	

AS 41.08.020(b)(4) and AAC 11 AAC 93.140(a) require that a copy of the well log be forwarded to the Department of Natural Resources within 45 days of well completion. Please email well logs to:

dnr.water.reports@alaska.gov OR send to

Alaska DNR, MLW, Alaska Hydrologic Survey
550 West 7th Avenue, Suite 1020
Anchorage, AK 99501

Anchorage Municipal Code 15.55.060(l) requires that a copy of this well log be forwarded to the Development Services Department within 30 days of well completion.

City Permit Number: _____
Date of Issue: ____/____/____

Parcel Identification Number: _____ - _____ - _____

Is well located at approved permit location? ☐ Yes ☐ No

41433

M-W DRILLING, Inc.

P.O. Box 10-378 • 10300 Old Seward Highway
(907) 349-8535
ANCHORAGE, ALASKA 99511

84-250

DRILLING LOG

Well Owner YUKON KOYUKUK SCHOOL DISTRICT Use of Well Farm

Location (address of: Township, Range, Section, if known; or distance main road)
Ruby Agricultural Building Complex

Size of casing 6" steel Depth of Hole 600 feet Cased to 175.3 feet

Static water level 40 ft. ~~(above)~~ (below) land surface. Finish of well (check one) open end ();
~~Screen~~ (); Perforated ().

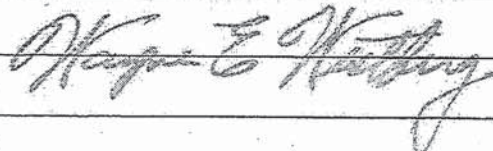
Describe screen or perforation 4" PVC Liner (3/8" D Hole/2') Installed to 312 feet.

Well pumping test at 2.5 gallons per ~~(hour)~~ (minute) for 16 hours with 160 ft.
of drawdown from static level.

Date of completion September 26, 1984

WELL LOG

Depth in feet from ground surface	Give details of formations penetrated, size of material, color and hardness
<u>0 TO 2</u>	<u>Casing stickup</u>
<u>2 TO 15</u>	<u>Sandy clay</u>
<u>15 TO 139</u>	<u>Sandy cobble gravel: large cobbles, dark gray</u>
<u>139 TO 141</u>	<u>Limestone (?): White powdery cuttings</u>
<u>141 TO 160</u>	<u>Sandy claystone: SL Calcareous (?)</u>
<u>160 TO 208</u>	<u>Grey siltstone: Calcareous, Water bearing fracture zones</u>
<u>TO</u>	<u>from 186' to 208'</u>
<u>208 TO 312</u>	<u>Soft shale: Fracture zone @ 312"</u>
<u>312 TO 600</u>	<u>Dark grey to black siltstone: Firm to hard, Fractures @ 495"</u>
<u>TO</u>	
<u>TO</u>	
<u>TO</u>	
<u>TO</u>	
<u>TO</u>	
<u>TO</u>	
<u>TO</u>	



NWHA Certified Contractor
Certificate No's. 814 & 973

APPENDIX D

HAZARDOUS BUILDING MATERIAL SURVEY

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**SUSTAINABLE ENVIRONMENT, ENERGY,
HEALTH & SAFETY PROFESSIONAL SERVICES**

September 9, 2015

Sent via email to: aweller@ahtna.net

Ahtna Engineering Services, LLC
1896 Marika Road, Suite 8
Fairbanks, AK 99709

ATTN: Andrew Weller

**RE: Hazardous Material Survey
Former Head Start Building, Ruby, Alaska**

Andrew,

NORTECH Sustainable Environment, Energy, Health & Safety Professional Services is pleased to provide this Hazardous Material Assessment of the former Head Start building in Ruby, Alaska. The following is a brief synopsis of the background, scope of work, methodology, field activities, and sampling results with discussion, including conclusions and recommendations where appropriate.

Background and Scope of Work

The former Head Start building in Ruby, Alaska has been used for a variety of functions, in particular as a preschool by the Tanana Chiefs Conference Head Start Program and a community meeting center. It originally functioned as a portion of Ruby's K through 12th grade school complex. According to local resident and builder William McCarty Jr., the building was constructed in 1963. As indicated in the Ruby Tribe and ADNR Brownfield Assessment or Cleanup Plan Request to DEC, an interior fuel-line leak related to vandalism of the building contaminated the building floor in 1981. The problem was further complicated in 2011, when the building was flooded with water from an interior plumbing leak, potentially spreading fuel contamination and causing mold damage.

The purpose of this project was to collect information about the building and property to determine what hazards require remediation for the building's safe reuse.

NORTECH's scope of work was to focus on the Hazardous Material Assessment portion of the project, which placed emphasis on identification of hazardous materials, including asbestos, mercury containing light bulbs, PCB containing ballasts, mold and other items requiring special handling.

Methodology

The project efforts were completed in accordance with **NORTECH's** Hazardous Material Assessment Methodology (v12) by a certified EPA AHERA asbestos inspector. This document is included as an attachment. A Certified Industrial Hygienist (CIH), Professional Engineer (PE) oversaw all project efforts.

Field Activities

On August 11, 2015 **NORTECH**, personnel completed a hazardous material inspection of the abandoned structure identified as the former Head Start Building. The structure is located southeast of the corner of Good Time Road and Airport Road in Ruby Alaska. The building is a single story structure, about 27 feet wide by 72 feet long. Flooring is constructed with two layers of plywood decking (top and bottom),

Accounting Office:
2400 College Rd
Fairbanks, AK 99709
907.452.5688
907.452.5694 Fax

3105 Lakeshore Drive
Suite A106
Anchorage, AK 99517
907.222.2445
907.222.0915 Fax

5438 Shaune Drive
Suite B
Juneau, AK 99801
907.586.6813
907.586.6819 Fax

1623 Mill Bay Rd #5
Kodiak, AK 99615
907.942.7700
907.452.5694 Fax

www.nortechengr.com



sandwiching floor joist and fiberglass batt insulation installed in the joist cavities. The joists and floor system are supported by beams supported on posts and pad foundation units. The crawlspace has plywood skirting that has been insulated with spray urethane foam. Walls are constructed with 2" X 4" studs sheeted on the inside with gypsum wallboard or wood paneling with no gypsum wallboard (GWB) under the paneling and T-111 siding on the exterior.

Heating was provided by a fuel oil fired furnace and a fuel oil Monitor Stove. Both units were controlled by wall mounted thermostats, however the thermostat controlling the oil fired furnace has been removed. The remaining thermostat uses a bi-metal spring and does not contain mercury. One disconnected older oil fired furnace is located in the mechanical room and is not in use. The boiler room GWB was 70% fire taped with one coat of joint compound bedding the tape and sealing the gaps between GWB sections.

The building materials sampled as suspect asbestos containing materials, included gypsum wallboard, joint compound, and various flooring and ceiling materials. A total of 14 suspect asbestos samples were collected and submitted for laboratory analysis by the polarized light microscopic (PLM) method. Red paint chips from the T-111 siding and white paint chips from the exterior trim were collected and sent to IATL laboratories for analysis of lead content. Additionally, all interior and exterior painted surfaces were assessed for lead content using a handheld NITON XLP-303A X-Ray fluorescence (XRF) instrument.

Visible mold amplification was observed on the lower portion of the mechanical room walls, approximately 25 sq.ft. The roof penetration for the exhaust stack was leaking, which provides the necessary water source and moisture required for mold amplification.

Flooring in the furnace room was assessed for fuel contamination through a combination of visual observations and photoionization detector (PID) field screening. There was no visible oil staining on the flooring surface; flooring in the furnace room is a combination of bare subfloor (plywood) and VAT. Nine holes were drilled in the floor, allowing PID field screening of the flooring materials.

Sample Results and Analysis

Sample results are discussed and analyzed below by category. Sample locations are presented in Figure's 1 and 2. A complete copy of the laboratory results is attached.

Asbestos: Asbestos Containing Materials (ACM) materials identified during this assessment are listed below with approximate quantities:

- Friable (Category 1) – None observed or reported
- Non-Friable (Category 1)
 - o Furnaces with presumed ACM gaskets, 2 each
 - o Flooring
 - 12"X12" Tan VAT Room A 105 sq. ft.
 - Sheet vinyl, Room B 175 sq. ft.
 - Mastic under 12"X12" off white tile, Room C 175 sq. ft.
 - Mastic under sheet vinyl, Room I 775 sq. ft.
 - o Non-Friable (Category 2) - ACM joint compound in the boiler room 30 sq. ft.
 - o

The walls and ceiling of the boiler room are fire taped with asbestos containing joint compound. One coat of joint compound was used to bed paper tape and was not top coated with additional joint compound or painted. The joint compound if removed requires abatement by certified



asbestos workers using wet methods or may be managed in place by encapsulation or other viable means.

VAT, ACM sheet vinyl and associated mastics may be abated and removed by certified asbestos workers. Alternatively, the ACM may be managed in place. Encapsulation, encasement, enclosure, or repair may be viable alternatives to removal. In-place management techniques should be considered before deciding to remove undamaged ACM.

ACM may remain in the building and managed in place (MIP) under an Asbestos Management Plan (AMP). Non-Friable Category 1 ACM may remain in the buildings during demolition; however, all debris must be disposed as ACM. Abatement or demolition of the ACM joint compound, VAT and mastic is an OSHA class II asbestos work category requiring asbestos work practices and certified workers. All ACM requires proper disposal at a landfill permitted to accept this hazardous waste.

Lead: Four paint chips were analyzed by IATL laboratories to assess lead content. All sample results tested were below the 1.0 mg/cm² HUD standard for lead based paint in low income housing. Additionally, all painted surfaces were assessed for lead content using a handheld NITON XLP-303A X-Ray fluorescence (XRF) instrument. The results ranged from 0.0 mg/cm² to 0.2 mg/cm², well below HUD standards. Paints with lead concentrations less than the HUD standard may represent a hazard for workers who are completing work practices involving lead trigger tasks.

Other Hazardous materials

The following miscellaneous hazardous materials were observed and quantified:

- Mercury containing T-8 fluorescent light bulbs 24 ea.
- Active mold amplification in the mechanical room 30 ft²

The stack penetration should be repaired to eliminate water intrusion that is causing mold amplification seen in the boiler room. Once the repair is made, the impacted building materials should be removed and the area disinfected with a bleach solution.

Not all light fixtures were taken apart and the ballasts inspected. Potentially, PCB ballasts may be found in some fluorescent fixtures. Ballasts should have a manufacturer label attached that will state whether the ballast is PCB or No PCB's. If no label is observed on any ballast, it must be considered PCB containing and disposed of as hazardous waste.

Following the abatement or removal of the other noted hazardous materials, universal wastes or materials requiring special handling, the project demolition waste is considered non-hazardous. All information about hazardous materials associated with the building should be made available to employees, contractors and/or abatement/demolition contractors associated with the renovation/demolition of the building. All hazardous materials previously identified, identified during this survey, or discovered during demolition/renovation, must be handled carefully using appropriate work practices and disposed of properly under applicable federal and state regulatory guidelines. Project renovation or demolition specifications should note these inspection findings, address concerns identified and, where appropriate, require the contractor to submit a work plan for approval.

Fuel Oil Spill

PID readings at the level of the subfloor ranged from less than 1 ppm to 21.6 ppm (with two locations above 20 ppm). PID readings at the bottom of the floor-joist cavities (down in the



fiberglass insulation) ranged from less than 1 ppm to 108 ppm (again with two locations above 20 ppm). The fuel-affected area was limited to the southwest corner of the furnace room (Room E; Figure 3), and comprised about 30 sq. ft. of flooring and associated insulation.

Conclusions and Recommendations

Based on the findings of the hazardous material assessment, the following conclusions and recommendations have been developed:

- No friable asbestos containing building materials
- Non-friable asbestos containing building materials including:
 - o Gypsum wallboard joint compound
 - o Vinyl asbestos tile (VAT) flooring
 - o 2 Furnaces with presumed asbestos containing gaskets
 - o No lead paint that exceeds EPA HUD guidance was identified
 - o Other hazardous materials or conditions requiring special attention include:
 - Roof stack penetration leaking and causing mold amplification in the boiler room
 - Mercury containing fluorescent light tubes

Following the abatement or removal of the all identified hazardous materials, universal wastes or materials requiring special handling, the remaining project demolition waste would be considered non-hazardous.

This hazardous building materials assessment was executed to assist in identifying the potential hazards and associated regulatory constraints prior to pre-renovation selective demolition and/or involved with management, abatement and disposal of materials identified. Specific renovation or abatement work practices may require additional sampling to comply with OSHA worker exposure regulatory guidelines. All information about hazardous materials associated with the building should be made available to employees, contractors and/or abatement/demolition contractors associated with the renovation/demolition of the building.

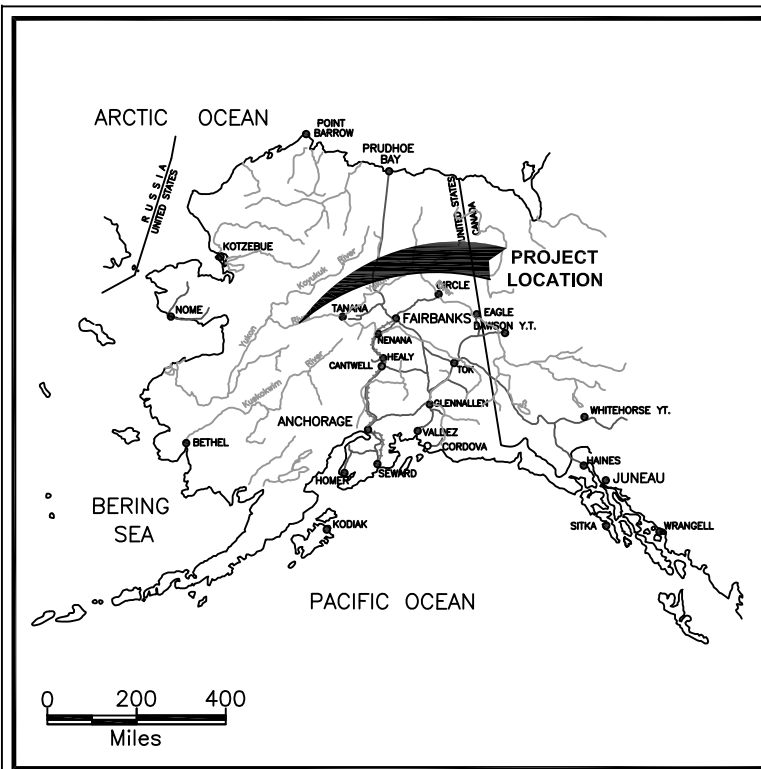
If you have any questions or require additional professional services or advice, please let us know. We thank you for the opportunity to work with you on this project and appreciate your confidence in our Firm.

Sincerely,
NORTECH

Doug Dusek
Environmental Specialist

John Hargesheimer, CIH, PD, CSBA
President and CEO

Attachments: Figures
Site photos
Methodology
Laboratory Results



SUSTAINABLE ENVIRONMENT, ENERGY, HEALTH & SAFETY
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 1623 Mill Bay Road Ste.#5, Kodiak, AK. 99615 907-942-7700

Location Map
 Ruby Community Center Hazardous Materials Assessment
 Ruby, Alaska

DATE: 8/25/2015	SCALE: 1" = 1 mile
DESIGN: DD	PROJECT: 15-1127
DRAWN: CMR	DWG: 151127a(01)

FIGURE
 1

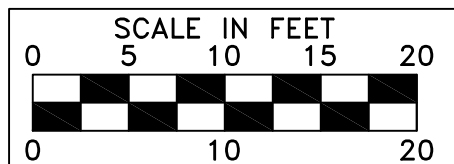
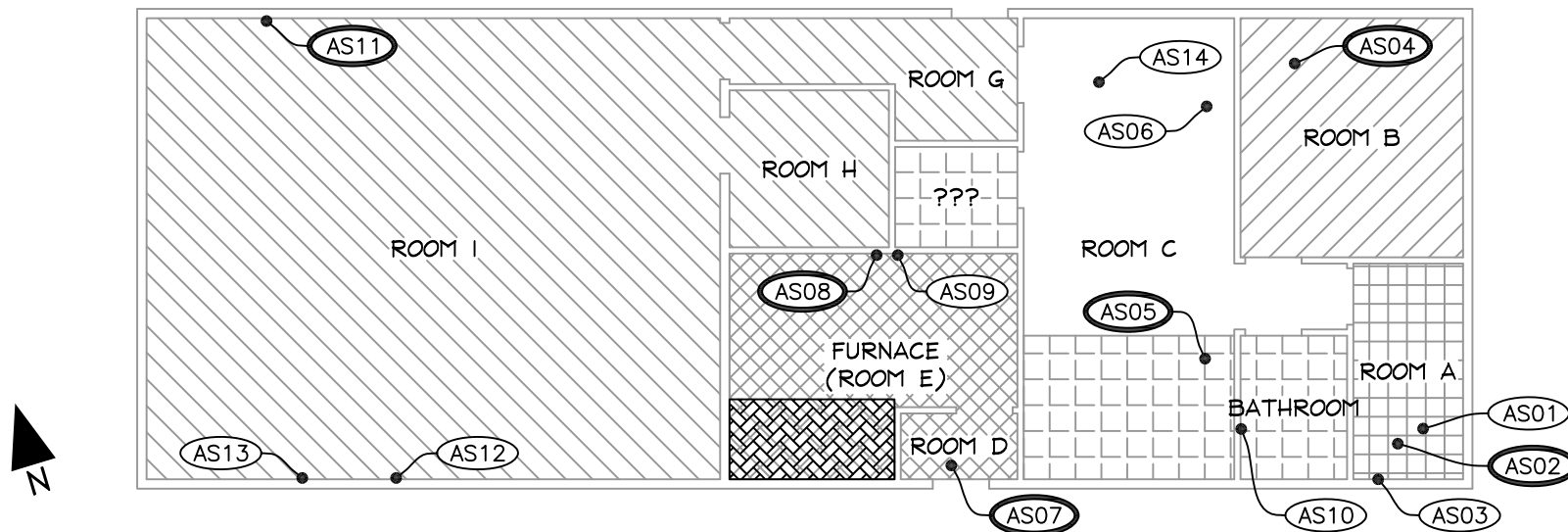


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Vicinity Map
 Ruby Community Center Hazardous Materials Assessment
 Ruby, Alaska

DATE: 8/25/2015	SCALE: 1" = 300'
DESIGN: DD	PROJECT: 15-1127
DRAWN: CMR	DWG: 151127a(02)

FIGURE
 2



LEGEND

- ASBESTOS SAMPLE LOCATIONS
 NEGATIVE (<1% ASBESTOS)
- ASBESTOS SAMPLE LOCATIONS
 POSITIVE (≥ 1% ASBESTOS)
- SEE ASBESTOS TABULATED RESULTS FOR ACM SAMPLE NUMBER

- 12x12 TAN/BROWN ACM FLOOR TILE ~105sq.ft.
- ACM SHEET VINYL ~175sq.ft.
- MASTIC UNDER 12x12 OFF-WHITE ACM FLOOR TILE ~200sq.ft.
- MASTIC AND 9x9 ACM FLOOR TILE ~200sq.ft.
- ACM MASTIC UNDER SHEET VINYL ~900sq.ft.
- FUEL

Asbestos Sample Results - Ruby Community Center

Sample	DESCRIPTION	SAMPLE LOCATION	LAB RESULTS	COMMENTS
AS01	White/Tan Ceiling Tile	Room A	Not Detected	
AS01	Mastic for White/Tan Ceiling Tile	Room A	Not Detected	
AS02	Tan/Brown Floor Tile	Room A	1.3%	
AS02	Tan Mastic for Tan/Brown Tile	Room A	Not Detected	
AS03	Black Cove Base	Room A	Not Detected	
AS03	Mastic for Cove Base	Room A	Not Detected	
AS04	Sheet Vinyl	Room B	25%	
AS05	Off-White 12x12 Tile	Room C	0.5%	
AS05	Mastic for Off-White Tile	Room C	1.2%	
AS06	Brown Floor Tile	Room C	Not Detected	
AS06	Clear Mastic for Brown Floor Tile	Room C	Not Detected	
AS07	Off White/Black 9x9 Floor Tile	Room D	1.3%	
AS07	Black Mastic for 9x9 Tile	Room D	3.8%	
AS08	Joint Compound	Room E	1.2%	
AS09	Sheet Rock	Room E	Not Detected	
AS10	Black Mastic for Fieble Board Wall	Room F	Not Detected	
AS11	Tan/Black Mastic	Room I	1.5%	
AS11	Sheet Vinyl	Room I	Not Detected	
AS12	Sheet Rock	Room I	Not Detected	
AS13	Joint Compound	Room I	Not Detected	
AS14	White Ceiling Tile	Room C	Not Detected	
AS14	White Ceiling Tile Mastic	Room C	Not Detected	



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Asbestos Sampling and Results
 Ruby Community Center Hazardous Materials Assessment
 Ruby, Alaska

DATE: 9/8/2015
 SCALE: N.T.S.
 DESIGN: DD
 PROJECT: 15-1127
 DRAWN: CMR
 DWG: 151127a(03)

FIGURE

3

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Photo 1: *Former Ruby Alaska Headstart Facility*

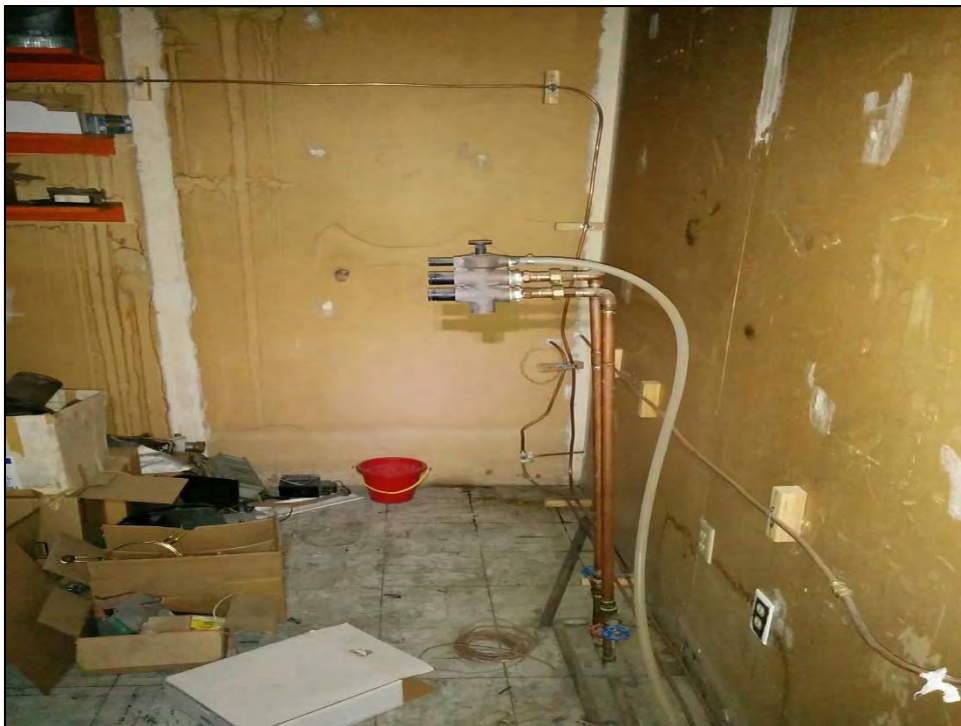


Photo 2: *Boiler room with partial fire tapping and VAT*



ENVIRONMENT, ENERGY, HEALTH & SAFETY CONSULTANTS

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HAZARDOUS MATERIAL STANDARDIZED METHODOLOGY (Version 13) April, 2014

Objective and Management

NORTECH hazardous materials assessment methodologies are developed to comply with currently applicable regulations utilizing standard industrial hygiene practices designed for the anticipation, recognition, evaluation, and control of those factors or stressors arising in or from the workplace that may cause sickness, impaired health and well-being, or significant discomfort among workers or citizens of the community. Qualified personnel with current certifications and experience conduct field assessment inspection and sampling efforts. All work completed is managed, reviewed, and signed off on by a board Certified Industrial Hygienist (CIH) or Professional Engineer.

Scope of Work

NORTECH provides a variety of hazardous material services as necessary to meet project specific needs cost effectively. In order to minimize costs, **NORTECH** has developed the following standardized hazardous material assessment scopes of work.

Limited Hazardous Material Assessment: The assessment scope of work is limited to specifics as specified by the client in the written contract and/or project communications. Limitations may include/exclude contaminants, destructive testing, costs, and/or areas to be assessed.

Pre Renovation Hazardous Material Assessment: The assessment is limited to a specific project renovation scope.

Pre-Demolition Hazardous Material Assessment: The assessment is in preparation for a entire building demolition.

Hazardous materials included in this standard are:

- Asbestos Containing Materials (ACM)
 - Building Materials
 - Naturally Occuring Asbestos (NOA)
- Lead Based Paint (LBP)
- Universal Wastes
- Poly Chlorinated Byphenyls (PCB)
- RCRA Eight Heavy Metals
- Other Wastes Requiring Special Handling

Definition of Hazardous Materials

Hazardous materials are defined as any material requiring special handling or disposal during demolition or renovation. Of particular interest are asbestos containing building materials (ACBM), lead based paint (LBP), RCRA eight heavy metals and other hazardous materials

including polychlorinated biphenyls (PCBs), radioactive materials in smoke detectors & self illuminating exit signs, lead-acid batteries, wastewater, water intrusion fungal amplification, petroleum oils and lubricants (POLs) mercury containing equipment (switches, bulbs etc.) and other chemical and biological contaminants.

Universal Waste

EPA's universal waste regulations set forth in 40 CFR part 273 streamline hazardous waste management standards for federally designated "universal wastes," which include:

- Batteries
- Paints & pressurized containers
- Chemicals & pesticides
- Mercury in switches and fluorescent light tubes

The regulations govern the collection and management of these widely generated wastes. These regulations are designed to improve hazardous material handling and disposal of universal wastes by easing the regulatory burden on generators and facilitating disposal program development.

Regulatory

The hazardous material surveys are conducted to comply with the asbestos survey requirements of the Occupational Safety and Health Administration (OSHA) found in 29 CFR 1926. These regulations state that before authorizing or allowing any construction, demolition, renovation, or remodeling, the owner, owner's agent, or employer, must notify contractors or other persons of the location and quantities of ACM within the work area.

U.S. Environmental Protection Agency National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires a thorough inspection for friable and non-friable ACM by an accredited Asbestos Hazard Emergency Response Act (AHERA) inspector prior to any renovation or demolition activity (40 CFR 61.145). NESHAP also requires notification for removal or abatement of regulated quantities of ACM (>260 square feet, >160 linear feet, or >35 cubic feet of regulated asbestos containing material (RACM)).

Asbestos Containing Materials

The asbestos sampling collection technique used during the survey generally follows the AHERA method as defined in 40 CFR 763. Laboratory analysis of samples are completed by a laboratory certified through the National Voluntary Laboratory Accreditation Program (NVLAP) to perform asbestos analysis by polarized light microscopy (PLM) according to EPA method 600/R/93/116 to determine the percent concentration by weight as required by the current OSHA standard. Building material containing 1% or greater asbestos content is considered asbestos containing material. Suspect material with less than 5% asbestos is point counted by 400 count method for greater accuracy.

Asbestos in Dusts

Protocol for determining asbestos containing material (ACM) in dust collection requires analysis by TEM (Transmission Electron Microscopy) by a laboratory certified through the National Voluntary Laboratory Accreditation Program (NVLAP) to perform TEM analysis. Dust collection for lab testing may either involve dust wipe collection using a laboratory supplied "Ghostwipe"™

and sized template, or by utilizing a laboratory supplied 37 mm TEM air cassette inline with a pump and plastic tubing and vacuuming a known amount of surface area coated in dust.

With regard to lab analysis of samples collected, there are no standards for asbestos in settled dust against which one can compare results. However, the literature (Millett and Hays) has provided some general conclusions regarding interpretation of sampling data on the level of asbestos in settled dust and is based on extensive field data, observation, and experience. They report that a level of less than 1,000 asbestos structures/cm² is low, while levels above 10,000 s/cm² are considered generally above background. Levels greater than 100,000 s/cm² are indicative of elevated concentrations of asbestos fibers with significant risk of exceeding the OSHA permissible exposure level (PEL) for most work tasks.

Lead Based Paint (LBP)

Quantification of lead-based paint is performed according to NIOSH 7702, using a Thermo Fisher NITON XLp-303A (XRF), x-ray fluorescent spectrum analyzer, providing EPA accepted real-time, on-site sample results. A Performance Characteristics Sheet (PCS), that routinely accompanies the NITON analyzer, provides supplemental information to be used in conjunction with Chapter 7 of the HUD guidelines. The PCS indicates that substrate corrections are not required for this instrument when operated in accordance with the manufacturer's instructions and HUD guidelines. Environmental Protection Agency/Department of Housing and Urban Development (EPA/HUD) protocol for the inspection of LBP in residential structures is generally followed.

Lead analysis of paint may also be determined by scrape sample and lab analysis. Representative paint scrape samples of the building's construction materials are collected from each representative paint type and color. Paint scrapes are collected within a 10 cm² area and sent to lab for analysis by percentage of lead per weight of paint collected.

All paint contains a measurable amount of lead, however, EPA and HUD consider paint containing 1.0 mg/cm² (XRF analysis) or 0.5 percent (5,000 ppm) by weight (lab analysis) and higher to be LBP. These guidelines may not be directly applicable to this project, but are a good reference for evaluating the investigation's sample results. Paint with lower concentrations of lead than these thresholds may still pose an OSHA health hazard if mishandled. The LBP assessment is completed by qualified personnel with current EPA lead inspector certification.

Poly Chlorinated Biphenyls (PCB)

Quantification for PCB contamination on structural and various non-porous construction materials (structural members, construction materials, equipment, and flooring) is performed utilizing lab provided wipe sampling materials. Upon selecting a sampling site, a 100 square centimeter (cm²) sample is typically collected using a template (i.e. 10 cm by 10 cm). Throughout the process the sampler remains aware of the sampling area and the possibility of cross contamination during all stages of the sampling activity. All surfaces are wiped with a uniform pressure. Wiping proceeds from left to right in rows from the top to the bottom of the sampling area. The sampling area is wiped again with the same uniform pressure in columns from the top to the bottom from the left side to the right side of the entire sampling area. It is not critical whether wiping starts at the top left or with rows first and then columns. The objective is to systematically, thoroughly, and consistently wipe the entire sampling area twice, each time from a different direction and orientation.



Wipe sample clearance criteria for PCB contamination ranges, based on intended use, from 10 ug/cm² for indoor high contact residential areas up to 100 ug/100 cm² for indoor low contact (porous surface option).

PCB concentrations are based on a weight-per-weight basis (such as ppm or mg/kg) within a known area of concentration. In the State of Alaska,¹ EPA considers construction materials containing >1 ppm (mg/kg) to be PCB contaminated but acceptable for disposal at permitted landfills with a liner and leachate program, and >50 ppm (mg/kg) PCB to be a hazardous material requiring out of state disposal. Lower 48 states in the US that do not have authorized landfills permitted to accept PCB contaminated waste must differ to a nearest permitted landfill in another State.

RCRA Eight Heavy Metals

Determination of the demolition waste toxicity for the RCRA eight heavy metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium and Silver) is based on a certified lab performing the Toxicity Characteristic Leaching Procedure (TCLP) (EPA SW846, Method-1311) analysis of a representative composite sample of the structure's building materials.

During the field effort, a visual inspection is conducted to identify the presence of each of the RCRA eight heavy metals and approximate percent by weight of each expected to be in the building debris waste stream. A representative sample of the entire waste stream, including the RCRA metals present, is collected and homogenized into a composite sample of the entire project's debris/waste stream and then analyzed at a certified lab in accordance with TCLP procedure. The TCLP test measures the potential for the eight metals identified in the Resource Conservation and Recovery Act (RCRA) to leach from a representative composite sample of the debris/waste stream under simulated landfill conditions. RCRA regulations allow for calculating the TCLP result from a composite sample with total metals using the "20:1 Rule" that account for the dilution of metals concentrations during the analysis.

Another alternative method is to calculate a Theoretical TCLP based on the observed quantities of construction materials with regard to potential heavy metals. Assuming all paint associated with the structure is lead-based paint, a theoretical calculation of the ratio between paint to construction debris waste can be used in place of a representative waste stream (TCLP) sampling to determine whether the project waste stream will be hazardous for lead and heavy metals in accordance with hazardous waste standard. This method involves using project specific knowledge to calculate the concentration of lead in the entire quantity of debris as follows:

If a waste is 100% solid, as defined by the TCLP method, then the results of the total constituent analysis may be divided by twenty to convert the total results into the maximum leachable concentration. This factor is derived from the 20:1 liquid-to-solid ratio employed in the TCLP. If a waste has filterable liquid, then the concentration of the analyte in each phase (liquid and solid) must be determined.

¹ January 2009 Version, Revisions to the EPA PCB Questions and Answer Manual



The following equation may be used to calculate this value:

$$\frac{[A \times B] + [C \times D]}{B + [20 \text{ (L/kg)} \times D]} = E$$

Where:

A = Concentration of the analyte in liquid portion of the sample (mg/L)

B = Volume of the liquid portion of the sample (L).

C = Concentration of the analyte in solid portion of the sample (mg/kg)

D = Weight of the solid portion of the sample (kg)

E = Maximum theoretical concentration in leachate (mg/L)

The value obtained (E) can be used to show that the maximum theoretical concentration in a leachate from the waste could not exceed the concentration specified in the toxicity characteristic (TC) (40 CFR 261.24).

In addition, if the total constituent analysis results themselves are below the TC limits without dividing by 20, then the same argument holds true, i.e., the maximum theoretical concentration in the leachate could not exceed the TC limits.

The 100 milligrams per kilogram value used in the determination is based on the 20:1 rule which represents the lowest possible mass analysis concentration, which could leach out greater than 5.0 milligrams per liter in a TCLP test. This is due to the 20:1 dilution ratio of the TCLP test protocol and also assumes that 100% of the lead in the sample will leach out. In most circumstances, 100% of the lead would rarely leach out. However, this assumption must be made in the place of actual TCLP laboratory results. This "worst-case" assumption adds a "safety factor" to compensate for errors in the data or in calculating the mass of the structure. If the initial test results show that the average weight percent of lead in the lead-based paint, the average paint thickness, or the average paint density varies widely from one part of the structure to another, it may be better to do separate "mass of lead-based paint" or "mass of lead in the lead-based paint" calculations for each part of the structure with similar values. The individual results for the different parts of the structure can then be summed before dividing by the mass of the entire structure.

The presence or absence of suspect RCRA 8 hazardous metals is verified by visually inspecting the structure, testing multiple like components with a NITON XRF, or collecting paint chip samples for laboratory analysis during the investigation. If no RCRA 8 suspect materials or suspect conditions are observed, the total lead in milligrams (mg) can be calculated for the materials in which LBP concentrations are assumed to be greater than EPA/HUD's standard of <1.0% limit for what can be considered non-lead based paint. The calculations use the highest average theoretical value (1.0 or greater) for each painted surface. Not all surfaces of the structure are painted, nor are openings & voids accounted for in the square footages calculated. Multiplying the average value of LBP (in mg/cm²) by the total square footage area (in cm²) of all painted surfaces (including void spacing), a total amount of milligrams of lead in the paint is estimated. A total (minimum) expected mass of kilograms of painted demolition debris is then

calculated for the waste stream. The final calculation of the theoretical TCLP then uses the total of milligrams of paint divided by the kilograms of painted demolition debris which equals the mass (mg/kg) of lead in the demolition waste stream. If the mass concentration of lead is less or more than the 20:1 rule criteria of 100 mg/kg, the debris waste stream is considered either non-hazardous or hazardous for leachable lead.

Other Hazardous Materials

Determination of other hazardous materials involves the processes described by EPA as follows:

- Is the material a solid waste? (See: 40 CFR Part 261.2)
- Is the waste specifically excluded from RCRA? (See: 40 CFR Part 261.4)
- Is the waste a listed hazardous waste? (See: 40 CFR Part 261.30)
- Does the waste exhibit a characteristic of hazardous waste? (See: 40 CFR Part 261.20)

During structure investigation other hazardous materials posing an environmental concern or health risk are watched for and where visually observed are noted in the report findings. Determinations of other hazardous materials were based on the above EPA guidelines. These other hazardous materials include:

- Mastics
- Caulks
- Lead building materials
- Stored chemicals, heating oils, hydraulic oils, automotive fuel products & lubricants
- Radioactive materials in smoke detectors & self illuminating emergency exit signs
- Lead-acid batteries in emergency lighting and emergency exit signs
- Mercury in thermostats, fluorescent light tubes & HID mercury vapor lighting
- PCB containing power transformers & PCB containing fluorescent light ballasts
- Stored, unidentified or flammable liquids, paints or pressurized containers
- Freon gas canisters
- Fire extinguishers & HALON fire suppression systems.

Limitations

NORTECH provides a level of service that is performed within the standard of care and competence found within this practice and the engineering profession. It must be recognized that limitations in a hazardous material inspection and assessment exist. The data presented should be considered representative of only the time and observances of our inspection. In addition, changes in the condition of the materials within the facility can occur with the passing of time, due to natural processes and/or from human activities. **NORTECH** has performed the work, made the findings, and proposed recommendations in accordance with generally accepted environmental engineering practices using the best technology available at the time the work was performed.

NORTECH has based its conclusions and recommendations on our current understanding of regulatory policies. The regulations concerning hazardous materials are constantly changing, including the interpretations of regulating agencies. If changes in regulations or their interpretation occur, then **NORTECH** reserves the right to amend or revise conclusions and/or recommendations.

CERTIFICATE OF ANALYSIS

Client: Nortech Env'l & Engineering
2400 College Rd
Fairbanks AK 99709

Report Date: 8/20/2015
Report No.: 371095
Project: Ruby Haz Mat
Project No.: 15-1127

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 5714584	Description / Location: White/Tan Ceiling Tile
Client No.: AS-1	Room A
<u>% Asbestos</u>	<u>Type</u>
None Detected	None Detected
	<u>% Non-Asbestos Fibrous Material</u>
	70
	20
	<u>Type</u>
	Mineral Wool
	Cellulose
	<u>% Non-Fibrous Material</u>
	10

Lab No.: 5714584	Description / Location: Brown Mastic	Layer No.: 2
Client No.: AS-1	Room A	
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>
None Detected	None Detected	None Detected
		None Detected
		<u>% Non-Fibrous Material</u>
		100

Lab No.: 5714585	Description / Location: Tan/Brown Floor Tile; 12x12
Client No.: AS-2	Room A
<u>% Asbestos</u>	<u>Type</u>
PC 1.3	Chrysotile
	<u>% Non-Asbestos Fibrous Material</u>
	None Detected
	<u>Type</u>
	None Detected
	<u>% Non-Fibrous Material</u>
	PC 98.7

Lab No.: 5714585	Description / Location: Tan Mastic	Layer No.: 2
Client No.: AS-2	Room A	
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>
None Detected	None Detected	None Detected
		None Detected
		<u>% Non-Fibrous Material</u>
		100

Accreditations: NIST-NVLAP No. 101165-0 NY-DOH No. 11021 AIHA-LAP, LLC No. 100188
*This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA or any agency of the U.S. government
This report shall not be reproduced except in full, without written approval of the laboratory.*

Analytical Method: US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)

Comments: Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analysis Performed By: M. Mirza

Approved By:

Date: 8/20/2015

Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: Nortech Env'l & Engineering
2400 College Rd
Fairbanks AK 99709

Report Date: 8/20/2015
Report No.: 371095
Project: Ruby Haz Mat
Project No.: 15-1127

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 5714586	Description / Location: Black Cove Base
Client No.: AS-3	Room A
<u>% Asbestos</u>	<u>Type</u>
None Detected	None Detected
<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>
None Detected	None Detected
	<u>% Non-Fibrous Material</u>
	100

Lab No.: 5714586	Description / Location: Dk Brown Mastic	Layer No.: 2
Client No.: AS-3	Room A	
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	100
<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	
None Detected	None Detected	

Lab No.: 5714587	Description / Location: Ylw/Brn/Org/Blk Vinyl Sheet Flooring
Client No.: AS-4	Room B
<u>% Asbestos</u>	<u>Type</u>
25	Chrysotile
<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>
None Detected	None Detected
	<u>% Non-Fibrous Material</u>
	75

Accreditations: **NIST-NVLAP No. 101165-0** **NY-DOH No. 11021** **AIHA-LAP, LLC No. 100188**
*This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA or any agency of the U.S. government
This report shall not be reproduced except in full, without written approval of the laboratory.*

Analytical Method: US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)

Comments: Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analysis Performed By: M. Mirza

Date: 8/20/2015

CERTIFICATE OF ANALYSIS

Client: Nortech Env'l & Engineering

2400 College Rd

Fairbanks AK 99709

Report Date: 8/20/2015

Report No.: 371095

Project: Ruby Haz Mat

Project No.: 15-1127

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 5714588	Description / Location: Off-White/Lt Grey Floor Tile; 12x12
Client No.: AS-5	Room C
<u>% Asbestos</u>	<u>Type</u>
PC 0.5	Chrysotile
<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>
None Detected	None Detected
	<u>% Non-Fibrous Material</u>
	PC 99.5

Lab No.: 5714588	Description / Location: Brown/Black Mastic	Layer No.: 2
Client No.: AS-5	Room C	
<u>% Asbestos</u>	<u>Type</u>	
PC 1.2	Chrysotile	
<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	
None Detected	None Detected	
		<u>% Non-Fibrous Material</u>
		PC 98.8

Lab No.: 5714589	Description / Location: Brown Floor Tile; 12x12
Client No.: AS-6	Room C
<u>% Asbestos</u>	<u>Type</u>
None Detected	None Detected
<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>
None Detected	None Detected
	<u>% Non-Fibrous Material</u>
	100

Lab No.: 5714589	Description / Location: Clear Mastic	Layer No.: 2
Client No.: AS-6	Room C	
<u>% Asbestos</u>	<u>Type</u>	
None Detected	None Detected	
<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	
None Detected	None Detected	
		<u>% Non-Fibrous Material</u>
		100

Accreditations: NIST-NVLAP No. 101165-0 NY-DOH No. 11021 AIHA-LAP, LLC No. 100188

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Analytical Method: US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)

Comments: Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analysis Performed By: M. Mirza

Date: 8/20/2015

CERTIFICATE OF ANALYSIS

Client: Nortech Env'l & Engineering
2400 College Rd
Fairbanks AK 99709

Report Date: 8/20/2015
Report No.: 371095
Project: Ruby Haz Mat
Project No.: 15-1127

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 5714590	Description / Location: Off-White/Black Floor Tile; 9x9			
Client No.: AS-7				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
PC 1.3	Chrysotile	None Detected	None Detected	PC 98.7

Lab No.: 5714590	Description / Location: Black Mastic			Layer No.: 2
Client No.: AS-7				
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
PC 3.8	Chrysotile	None Detected	None Detected	PC 96.2

Lab No.: 5714591	Description / Location: Lt Tan Joint Compound			
Client No.: AS-8	Room E			
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
PC 1.2	Chrysotile	None Detected	None Detected	PC 98.8

Lab No.: 5714592	Description / Location: Tan/White Sheetrock			
Client No.: AS-9	Room E			
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	5	Cellulose	93
		2	Fibrous Glass	

Accreditations: NIST-NVLAP No. 101165-0 NY-DOH No. 11021 AIHA-LAP, LLC No. 100188
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Analytical Method: US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)

Comments: Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analysis Performed By: M. Mirza

Date: 8/20/2015

CERTIFICATE OF ANALYSIS

Client: Nortech Env'l & Engineering
2400 College Rd
Fairbanks AK 99709

Report Date: 8/20/2015
Report No.: 371095
Project: Ruby Haz Mat
Project No.: 15-1127

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 5714593	Description / Location: Black Mastic
Client No.: AS-10	Room F
<u>% Asbestos</u>	<u>Type</u>
None Detected	None Detected
<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>
None Detected	None Detected
	<u>% Non-Fibrous Material</u>
	100

Lab No.: 5714594	Description / Location: Tan/White Vinyl Sheet Flooring
Client No.: AS-11	Room I
<u>% Asbestos</u>	<u>Type</u>
None Detected	None Detected
	<u>% Non-Asbestos Fibrous Material</u>
	20
	5
	<u>Type</u>
	Cellulose
	Fibrous Glass
	<u>% Non-Fibrous Material</u>
	75

Lab No.: 5714594	Description / Location: Tan/Black Mastic	Layer No.: 2
Client No.: AS-11	Room I	
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Asbestos Fibrous Material</u>
PC 1.5	Chrysotile	None Detected
		<u>Type</u>
		None Detected
		<u>% Non-Fibrous Material</u>
		PC 98.5

Lab No.: 5714595	Description / Location: Tan/White Sheetrock
Client No.: AS-12	Room I
<u>% Asbestos</u>	<u>Type</u>
None Detected	None Detected
	<u>% Non-Asbestos Fibrous Material</u>
	5
	2
	<u>Type</u>
	Cellulose
	Fibrous Glass
	<u>% Non-Fibrous Material</u>
	93

Accreditations: NIST-NVLAP No. 101165-0 NY-DOH No. 11021 AIHA-LAP, LLC No. 100188
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Analytical Method: US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)

Comments: Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analysis Performed By: M. Mirza

Date: 8/20/2015

CERTIFICATE OF ANALYSIS

Client: Nortech Env'l & Engineering
2400 College Rd
Fairbanks AK 99709

Report Date: 8/20/2015
Report No.: 371095
Project: Ruby Haz Mat
Project No.: 15-1127

BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 5714596	Description / Location: White Joint Compound
Client No.: AS-13	Room 1
<u>% Asbestos</u>	<u>Type</u>
None Detected	None Detected
<u>% Non-Asbestos Fibrous Material</u>	<u>Type</u>
None Detected	None Detected
	<u>% Non-Fibrous Material</u>
	100

Lab No.: 5714597	Description / Location: White/Tan Ceiling Tile
Client No.: AS-14	Room C
<u>% Asbestos</u>	<u>Type</u>
None Detected	None Detected
	30
	60
	Cellulose
	Mineral Wool
	10

Lab No.: 5714597	Description / Location: Brown Mastic	Layer No.: 2
Client No.: AS-14	Room C	
<u>% Asbestos</u>	<u>Type</u>	<u>% Non-Fibrous Material</u>
None Detected	None Detected	100
	None Detected	
	None Detected	

Accreditations: NIST-NVLAP No. 101165-0 NY-DOH No. 11021 AIHA-LAP, LLC No. 100188

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Analytical Method: US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)

Comments: Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analysis Performed By: M. Mirza

Date: 8/20/2015

Chain of Custody

–Bulk Asbestos–

Contact Information

Client Company: Doug Dusek
Office Address: 2400 College Road
City, State, Zip: Faribanks
Fax Number: _____
Email Address: ddusek@nortechengr.com

Project Number: 15-1127
Project Name: Ruby Haz Mat
Primary Contact: Doug Dusek
Office Phone: 907 452-5688
Cell Phone: _____

PLM Instructions:

- ☒ PLM: Bulk Asbestos Building Materials EPA 600 R-93/116, 1993
- ☐ PLM: Bulk Asbestos Building Materials EPA 600 M-4/82-020, 1982
- ☐ PLM: Bulk Asbestos Building Materials NIOSH 9002, 1985
- ☐ PLM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.1, 2002
- ☐ PLM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.6, 2010
- ☐ TEM: Bulk Asbestos Building Materials NYSDOH-ELAP 198.4, 2009
- ☐ PLM: Point Counting
 - ☐ PC: via ELAP 198.1
 - ☐ PC: 400 Points
 - ☐ PC: 800 Points *
 - ☐ PC: 1600 Points *
- ☒ PLM: Instructions for Multi-Layered Samples
 - ☒ Analyze and Report All Separable Layers per EPA 600
 - ☐ Report Composite for Drywall Systems per NESHAP
 - ☐ Report All Layers and Composite Where Applicable
 - ☐ Only Analyze and Report Specifically Noted Layer
- ☐ PLM: Analyze Until Positive (Positive Stop)
 - ☐ AUP: by Homogenous Area as Noted
 - ☐ AUP: by Material Type as Noted
- ☐ PLM: NOB via 198.6
 - ☐ PLM: Friable via EPA 600 2.3
 - ☐ If <1% by PLM, to TEM via 198.4 *
 - ☐ If <1% by PLM, Hold for Instructions
- ☐ PLM: Non-Building Material *** (Dust, Wipe, Tape)
 - ☐ Soil or Vermiculite Analysis *
 - ☐ CARB 435

Special Instructions:

* Additional charge and turnaround may be required

** Alternative Method (ex: EPA 600/R-04/004) may be recommended by laboratory

E-MAILED

Turnaround Time

Preliminary Results Requested Date: _____

☐ Verbal ☐ Email ☐ Fax

Specific date / time

☐ 10 Day ☒ 5 Day ☐ 3 Day ☐ 2 Day ☐ 1 Day* ☐ 12 Hour** ☐ 6 Hour** ☐ RUSH**

* End of next business day unless otherwise specified. ** Matrix Dependent. ***Please notify the lab before shipping***

Chain of Custody

Relinquished (Name/Organization): nortech Doug Dusek

Date: 8/12/2015

Received (Name / iATL): _____

Date: _____

Sample Login (Name / iATL): mm

Date: 8/19/15

Analysis(Name(s) / iATL): mm

Date: 8/20/15

QA/QC Review (Name / iATL): _____

Date: 8-20-15

Archived / Released: _____ QA/QC InterLAB Use: _____

Date: _____

RECEIVED
Time: 9:00
Date: AUG 13 2015
iATL - By _____

Sample Log

–Bulk Asbestos –

Client: **Nortech**

Project: **15-1127**

Sampling Date/Time: **8/11/2015**

Bulk Asbestos Sample Log			
Client Sample #	iATL #	Location/Description	Notes
AS-1	5714584	Room A Ceiling Tile and Mastic	
AS-2	5714585	Room A, 12X12 Tile & Mastic	
AS-3	5714586	Room A Cove Base & Mastic	
AS-4	5714587	Room B, Sheet vinyl & Brown	
AS-5	5714588	Room C, 12"X12" Tile & Mastic	
AS-6	5714589	Room C 12"X12" peel and stick tile	
AS-7	5714590	9"X9" Tile & Mastic	
AS-8	5714591	Room E, Joint Compound	
AS-9	5714592	Room E, GWB	
AS-10	5714593	Room F, Black Mastic	
AS-11	5714594	Room I, Sheet vinyl & mastic	
AS-12	5714595	Room I, GWB	
AS-13	5714596	Room I/ Joint Compound	
AS-14	5714597	Room C Ceiling Tile and Mastic	

CERTIFICATE OF ANALYSIS

Client: Nortech Env'l & Engineering
2400 College Rd
Fairbanks AK 99709

Report Date: 8/20/2015
Report Number: 371072
Project: Ruby Haz Mat
Project No.: 15-1127

LEAD PAINT SAMPLE ANALYSIS SUMMARY

<u>Lab No.</u>	<u>Client No.</u>	<u>Location / Description</u>	<u>Concentration Lead By Weight (%)</u>
5709636	P1	Red Paint North Side	<0.0092
5709637	P2	White Paint North Side	0.070
5709638	P3	Red Paint South Side	<0.0077
5709639	P4	White Paint South Side	0.089

Accreditations:**NATIONAL LEAD LABORATORY ACCREDITATION PROGRAM (NLLAP)**

AIHA-LAP, LLC No. 100188

NYSDOH-ELAP No. 11021

Analytical Methods: ASTM D3335-85A "Standard Method To Test For Low Concentrations Of Lead In Paint By Atomic Absorption Spectrophotometry"
EPA SW846-(3050B:7000B) "Standard Method To Test For Low Concentrations Of Lead In Soils, Sludges and Sediments By AAS"

Comments: Regulatory limit is 0.5% lead by weight (EPA/HUD guidelines). Recommend multiple sampling for all samples less than regulatory limit for confirmation. All results are based on the samples as received at the lab. IATL assumes that appropriate sampling methods have been used and the data upon which these results are based have been accurately supplied by the client. Method Detection Limit (MDL) per EPA Method 40CFR Part 136 Appendix B. Reporting Limit (RL) based upon Lowest Standard Determined (LSD) in accordance with AIHA-ELLAP policies. LSD=0.2 ppm MDL=0.0044% by weight. RL= 0.010% by weight (based upon 100 mg sampled). * Insufficient sample provided to perform QC reanalysis (<200 mg) ** Not enough sample provided to analyze (<50 mg) *** Matrix / substrate interference possible. Sample results are not corrected for contamination by field or analytical blanks. This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA or any government agency. This report shall not be reproduced except in full, without written approval of the laboratory.

Date Received: 8/13/2015

Date Analyzed: 8/20/2015

Analyst: D. Jao

Approved By:

Frank E. Ehrenfeld, III
Laboratory Director



9000 Commerce Parkway, Suite B • Mount Laurel, NJ 08054
Phone: 877-428-4285/856-231-9449 • Fax: 856-231-9818

Chain of Custody

– Environmental Lead –

Contact Information

Client Company: Nortech
Office Address: 2400 College Road
City, State, Zip: Fairbanks, AK 99709
Fax Number: _____
Email Address: ddusek@nortechengr.com

Project Number: 15-1127
Project Name: Ruby Haz Mat
Primary Contact: Doug Dusek
Office Phone: 907 452-5688
Cell Phone: _____

iATL is accredited by the National Lead Laboratory Accreditation Program (NLLAP) to perform analytical testing of environmental samples for lead (Pb). The accreditation is through AIHA-LAP, LLC and several other nationally recognized state programs.

Matrix/Method:

- ☒ Paint by AAS: ASTM D3335-85a, 2009
☐ Wipe/Dust by AAS: SW 846: 3050B: 700B, 2010
☐ Air by AAS: NIOSH 7082, 1994
☐ Soil by AAS: EPA SW 846 (Soil)
☐ Water by AAS-GF: ASTM D3559-03D, USEPA 40CFR 141.11B, 2010
☐ Other Metals (Cd, Zn, Cr) by AAS
☐ Toxicity Characteristic Leaching Procedure (TCLP) by AAS: USEPA 1311
☐ Other _____

Special Instructions:

Turnaround Time

Preliminary Results Requested Date: _____ ☐ Verbal ☐ Email ☐ Fax

Specific date / time
☐ 10 Day ☒ 5 Day ☐ 3 Day ☐ 2 Day ☐ 1 Day* ☐ 12 Hour** ☐ 6 Hour** ☐ RUSH**

* End of next business day unless otherwise specified. ** Matrix Dependent. ***Please notify the lab before shipping***

Chain of Custody

Relinquished (Name/Organization): _____ Date: _____ Time: _____
Received (Name / iATL): _____ Date: _____ Time: _____
Sample Login (Name / iATL): _____ Date: 8/13/15 Time: _____
Analysis(Name(s) / iATL): DJ 8/20/15 Date: _____ Time: _____
QA/QC Review (Name / iATL): PC Schell Date: _____ Time: _____
Archived / Released: _____ QA/QC InterLAB Use: _____ Date: 1-3-2015 Time: _____

9000 Commerce Parkway, Suite B • Mount Laurel, NJ 08054
Phone: 877-428-4285/856-231-9449 • Fax: 856-231-9818

Sample Log

—Environmental Lead—

Client: Nortech Project: 15-1127

Sampling Date/Time: 8/11/2015

[illegible]

* = Insufficient Sample Provided to Perform QC Reanalysis (<200mg)

** = Insufficient Sample Provided to Analyze (<50mg) *** = Matrix / Substrate Interference Possible

FB = Method Requires the submittal of blank(s). ML = Multi Layered Sample. May result in inconsistent results.

These **preliminary results** are issued by iATL to expedite procedures by clients based upon the above data. iATL assumes that all of the sampling methods and data upon which these results are based, has been accurately supplied by the client. These results may not have been reviewed by the Laboratory Director. Final Certificate of Analysis will follow these preliminary results. The signed COA is to be considered the official results. All EPA, HUD, and NJDEP conditions apply.

DAILY QUALITY CONTROL DATA**LEAD SAMPLE ANALYSIS**

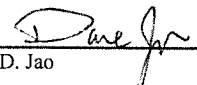
(DATE: 08 / 20 / 15)

Standard	Total Lead (mg)	Percent Recovery **
Reagent Blank	0.000	< LOQ
Blank Spike	0.500	95
Lab Control Std	1.410	97
Matrix Spike - LBP *	0.30	102
Matrix Spike - Wipe *	0.28	87
Matrix Spike - Soil *	0.337	91
Matrix spike - Air *	0.050	94
2.5 ppm Standard	0.25	101
10.0 ppm Standard	1.0	98
40.0 ppm Standard	4.0	97

AIHA-LAP, LLC No. 100188**NYSDOH-ELAP No. 11021**

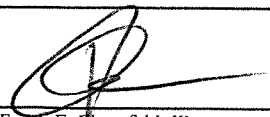
Analysis Method: ASTM D3335-85A
NIOSH 7082
EPA SW846 3050B 7000B

Comments: IATL assumes that all sampling complies with accepted methods.
All client supplied sampling data is assumed to be correct when calculating results.
Detection limit based upon 0.2 mg/L reporting limit and sample size.
* NIST Traceable.
** 80-120% acceptable limits.

Analyzed By: 

D. Jao

Date: 8/20/15

Approved By: Frank E. Ehrenfeld, III
Laboratory Director

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**SUSTAINABLE ENVIRONMENT, ENERGY,
HEALTH & SAFETY PROFESSIONAL SERVICES**

February 3, 2016

Ahtna Engineering Services, LLC
1896 Marika Road, Suite 8
Fairbanks, AK 99709

ATTN: Andrew Weller

**RE: Asbestos Summary Hazardous Material Survey
Former Head Start Building, Ruby, Alaska**

Andrew,

As requested in an email dated January 8, 2016, the following is a brief summary of the current exposure risk of the ACM found in the Ruby Head Start Building and brief description of asbestos, its properties, and general risks.

From the 1930s to the 1970s, asbestos was a popular additive to building materials because it is plentiful, readily available, and inexpensive. It was very important in the industry because of fire resistance, high strength, poor heat and electric conductor, and resistance to chemicals. For these reasons, asbestos was widely used for many years. Although asbestos has not been allowed in new building materials manufactured in the United States since the early 1980s, it was used in over three thousand different commercial products that are still encountered in buildings constructed prior to that 1985.

Exposure to asbestos fibers can cause serious health risks. Asbestos related exposure increase risk for:

- o Asbestosis – a scarring of the lungs that progresses over time and can be fatal
- o Pleural changes – the lining of covering the lungs thickens, causing decreased lung function
- o Lung Cancer
- o Mesothelioma - a rare cancer that affects the pleura (lining of internal organs)

The presence of asbestos does not necessarily mean that the health of occupants is endangered. Although exposure to asbestos is potentially hazardous, health risks can be minimized. For most asbestos containing materials (ACM), the fibers are released only if the ACM is disturbed. Intact and undisturbed ACM pose minimal health risk. When ACM is properly managed, release of fibers into the air is prevented or minimized, and the risk of asbestos related disease can be reduced to a negligible level.

Asbestos materials become hazardous when they release fibers into the air due to damage, disturbance, or deterioration over time. The potential for ACM to release fibers depends on its degree of friability. Friable ACM can easily be crumbled or reduced to a powder by hand pressure, and easily releases fibers into the air. The

Accounting Office:
2400 College Rd
Fairbanks, AK 99709
907.452.5688
907.452.5694 Fax

3105 Lakeshore Drive
Suite A106
Anchorage, AK 99517
907.222.2445
907.222.0915 Fax

5438 Shaune Drive
Suite B
Juneau, AK 99801
907.586.6813
907.586.6819 Fax

1623 Mill Bay Rd #5
Kodiak, AK 99615
907.942.7700
907.452.5694 Fax

www.nortechengr.com



white fibrous or fluffy spray-applied asbestos material found in many buildings for fireproofing, insulating, and soundproofing, is friable. Friable ACM is often found on heating systems, such as insulation around pipes and in boilers.

Asbestos that is tightly bound with another material, such as in vinyl tile, is generally considered non-friable. As installed and under normal conditions, non-friable materials do not release fibers. These materials will only emit fibers if handled or disposed of improperly. Activities that could cause these non-friable materials to release fibers including sanding, cutting, burning, and/or extensively damaged.

The Hazardous Material Survey for the Former Head Start Building, in Ruby, Alaska identified the following ACM in the building: vinyl asbestos tile (VAT), sheet vinyl, mastics, and a small amount of joint compound (boiler room only). Based on observations, each of these materials is considered non-friable. The broken VAT found in the facility is considered non-friable because it is not damaged or deteriorated to the extent that the tile edges would easily release fibers. VAT and sheet vinyl may become friable if subjected to operations such as excessive pounding, grinding or sawing. Additionally, high speed buffing of these surfaces should also be avoided.

While abatement of the ACM would remove all asbestos-related risk, asbestos regulations and provide for continued use of buildings and non-friable asbestos containing building materials under an Asbestos Management Plan. This document will identify the materials that contain asbestos, safe work practices around these materials, and the conditions under which the materials should be abated. The one concern with managing the ACM in place is that despite good intentions; the Management plan ends up being neglected and forgotten, which may result in future workers unknowingly using work practices that may cause asbestos exposure. For this reason, most building owners will eventually attempt to remove all ACM over time.

Based on the observations, each of the materials found in the Ruby Head Start Building is considered non-friable ACM. As currently installed, these items do not pose a significant health concern to building employees, building users, or other visitors. **NORTECH** recommends using the Hazardous Materials Assessment Report as the basis for an Asbestos Management Plan that identifies the materials and the appropriate methods for working with these materials to minimize potential exposure to asbestos during normal operations, facility repairs, and other work at the building. The Asbestos Management Plan should also identify more permanent means to encapsulate, encase, and enclose, ACM and appropriate means to repair damaged ACM. Each of these in-place management techniques should be considered before deciding to remove undamaged ACM.

If you have any questions or require additional professional services or advice, please let us know. We thank you for the opportunity to work with you on this project and appreciate your confidence in our Firm.

Sincerely,
NORTECH

A handwritten signature in black ink, appearing to read "Doug Dusek".

Doug Dusek
Environmental Specialist

APPENDIX E

DATA QUALITY ASSESSMENT, DATA REVIEW CHECKLISTS AND LABORATORY REPORTS

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Laboratory Data Review Checklist

Completed by:

Title: Date:

CS Report Name: Report Date:

Consultant Firm:

Laboratory Name: Laboratory Report Number:

ADEC File Number: ADEC RecKey Number:

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
☐ Yes ☐ No ☒ NA (Please explain.) Comments:

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?
☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

- b. Correct analyses requested?
☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?
☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

- b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

- c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

Samples were received in good condition.

- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

☐ Yes ☐ No ☒ NA (Please explain.)

Comments:

There were no sample-receiving discrepancies.

- e. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability were not affected.

4. Case Narrative

- a. Present and understandable?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

- b. Discrepancies, errors or QC failures identified by the lab?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

The laboratory provided a detailed case narrative noting a number of QC anomalies, including surrogate recovery failures, holding time exceedances, LCS/LCSD recovery and RPD failures, and MS/MSD recovery and RPD failures. The following sections of this checklist address these anomalies in detail.

- c. Were all corrective actions documented?

☐ Yes ☐ No ☒ NA (Please explain.)

Comments:

No corrective actions were required or performed.

- d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative notes no effect on sample data quality or usability. Refer to the following sections for our discussion of data quality and usability for the QC anomalies noted.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

b. All applicable holding times met?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

c. All soils reported on a dry weight basis?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

e. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

ii. All method blank results less than PQL?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

The following analytes were detected below the LOQ:

Prep batch	Analyte	Method	Result (ug/kg)
XXX34360	1-Methylnaphthalene	8270D SIMS (PAH)	2.02 J
XXX34360	2-Methylnaphthalene	8270D SIMS (PAH)	2.31 J
VXX28062	GRO	AK101	1680 J
VXX28039	Toluene	SW8021B	8.75 J
VXX28062	Toluene	SW8021B	12.5 J
VXX28073	GRO	AK101	768 J
VXX28073	P & M -Xylene	SW8021B	17.8 J
VXX28064	tert-Butylbenzene	SW8260B	8.5 J
VXX28073	Toluene	SW8021B	13.5 J

iii. If above PQL, what samples are affected?

Comments:

Results within 5x the MB concentration are qualified 'UB' at the LOQ or the sample concentration, whichever is higher. Results between 5-10x the MB concentration are considered estimated, biased high and qualified 'JH.' The following results were affected:

Sample	Analyte	Method	Result (ug/kg)	Flag
15-RBY-SB-12-4	GRO	AK101	1,950 J	UB
15-RBY-SB-14-4	GRO	AK101	2,900 J	UB
15-RBY-TP-01-10	GRO	AK101	5,460 =	UB
Trip Blank A	GRO	AK101	1,590 J	UB
15-RBY-TP-02-9.5	Toluene	SW8021B	17.4 J	UB
15-RBY-SB-01-4	Toluene	SW8021B	24.8 J	UB
15-RBY-SD-16-4	Toluene	SW8021B	51.5 J	UB
15-RBY-SB-12-4	Toluene	SW8021B	65.6 =	UB
15-RBY-SB-12-4	P & M -Xylene	SW8021B	118 =	JH
15-RBY-SB-16-4	Toluene	SW8021B	128 =	JH

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

☐ Yes ☐ No ☐ NA (Please explain.)

Comments:

See above

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality affected as described above. Data usability was not affected as results were several orders of magnitude below cleanup levels.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☐ Yes ☐ No ☐ NA (Please explain.)

Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

☐ Yes ☐ No ☒ NA (Please explain.)

Comments:

There were no metals/inorganic analyses.

- iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits?
And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%,
AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
☐ Yes ☐ ☒ No ☐ NA (Please explain.) Comments:

9 VOC analytes were recovered above laboratory control limits in the LCS for prep batch VXX28064. These analytes were not detected in corresponding project samples. Results were not affected.

2 VOC analytes were recovered above laboratory control limits in the LCS for prep batch VXX28043. These analytes were not detected in corresponding project samples. Results were not affected.

There were a number of MS/MSD recovery failures; however the original samples spiked were not in our project sample set, so our results were not affected.

- iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
☐ Yes ☐ ☒ No ☐ NA (Please explain.) Comments:

5 VOC analytes had LCS/LCSD RPDs above control limits for prep batch VXX28043. These analytes were not detected in corresponding project samples. Results were not affected.

There were a number of MS/MSD RPD failures; however the original samples spiked were not in our project sample set, so our results were not affected.

- v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments:

None of the recovery or RPD failures affected project samples.

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
☐ Yes ☐ No ☐ ☒ NA (Please explain.) Comments:

No sample results were affected.

- vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

Data quality and usability were not affected.

c. Surrogates – Organics Only

- i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☐ Yes ☐ No ☐ NA (Please explain.)

Comments:

DRO surrogate 5a Androstane was not recovered in 6 samples. There were also recovery failures for PAH surrogate 2-fluorobiphenyl in three samples. These recovery failures were due to dilution of the samples. Results are not considered affected.

GRO surrogate 4-Bromofluorobenzene was recovered above control limits for the following samples, due to matrix interference:

15-RBY-SB-16-4

15-RBY-SD-10-4

15-RBY-SD-16-4

15-RBY-SB-10-4

15-RBY-TP-12-4

15-RBY-TP-01-3

15-RBY-TP-02-4

GRO results for these samples are considered estimated, biased high, and flagged 'JH.'

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☐ NA (Please explain.)

Comments:

See above.

- iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

Data quality affected as described above. Affected GRO results are limited to samples with high levels of DRO, overall impact to data usability is minimal.

- d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

- i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☐ Yes ☐ No ☐ NA (Please explain.)

Comments:

Soil trip blanks were submitted for GRO, BTEX, and VOC analysis.

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☐ Yes ☐ No ☐ NA (Please explain.)

Comments:

Samples were submitted in a single cooler.

iii. All results less than PQL?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

Yes, however GRO was detected below the LOQ, at 1.59 mg/kg. However, this detection was attributable to laboratory based sample contamination (see section 6a). Project sample results are not affected.

iv. If above PQL, what samples are affected?

Comments:

None (see above).

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability were not affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

Field duplicate pairs 15-RBY-SB-10-4/15-RBY-SD-10-4, 15-RBY-SB-16-4/15-RBY-SD-16-4, 15-RBY-TP-02-4/15-RBY-TP-12-4 were reported in this work order. No field duplicates were analyzed for VOCs by 8260B, however no VOCs were detected so data quality is not considered affected.

ii. Submitted blind to lab?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☐ Yes ☒ No ☐ NA (Please explain.)

Comments:

RPDs exceeded the DQO of 50% for toluene in field duplicate pair 15-RBY-SB-16-4 / 15-RBY-SD-16-4. However, results were also affected by contamination identified in the method blank, and flagged JH (15-RBY-SB-16-4) and UB (15-RBY-SD-16-4). These flags are retained as the more conservative and final flags.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality was affected as described above. Data usability is not affected as the results are an order of magnitude below the cleanup level.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.)

Comments:

Soil samples were collected using disposable sampling equipment; an equipment blank was not required.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.)

Comments:

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? (Please explain.)

Comments:

Not applicable (see above).

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

☐ Yes ☐ No ☒ NA (Please explain.)

Comments:

There were no other data flags or qualifiers.

Laboratory Report of Analysis

To: Ahtna Engineering Svs
305 34th Ave
Fairbanks, AK 99701
907-455-5953

Report Number: **1158702**

Client Project: **Ruby PACP 20266.014**

Dear Andrew Weller,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.



SGS North America Inc.
Environmental Services – Alaska Division
Project Manager

Justin Nelson
2015.10.27
15:24:47 -08'00'

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Print Date: 10/27/2015 2:43:57PM

Laboratory Report of Analysis

To: Ahtna Engineering Svs
305 34th Ave
Fairbanks, AK 99701
907-455-5953

Report Number: **1158702**

Client Project: **Ruby PACP 20266.014**

Dear Andrew Weller,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Print Date: 10/27/2015 2:43:57PM

Case Narrative

SGS Client: **Ahtna Engineering Svs**
 SGS Project: **1158702**
 Project Name/Site: **Ruby PACP 20266.014**
 Project Contact: **Andrew Weller**

Refer to sample receipt form for information on sample condition.

15-RBY-TP-01-3 (1158702002) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (1740 %) does not meet QC criteria due to matrix interference.
 8270D SIM - PAH surrogate recovery for 2-fluorobiphenyl (156%) does not meet QC criteria due to sample dilution (50X).

15-RBY-TP-02-4 (1158702004) PS

AK102 - Surrogate recoveries for 5a-androstane (0%) do not meet QC criteria due to sample dilution (10X).
 AK101 - Surrogate recovery for 4-bromofluorobenzene (2500%) does not meet QC criteria due to matrix interference.
 8270D SIM - PAH surrogate recovery for 2-fluorobiphenyl (894%) does not meet QC criteria due to sample dilution (100X).

15-RBY-TP-12-4 (1158702005) PS

AK102 - Surrogate recoveries for 5a-androstane (0%) do not meet QC criteria due to sample dilution (10X).
 AK101 - Surrogate recovery for 4-bromofluorobenzene (2590%) does not meet QC criteria due to matrix interference.
 8270D SIM - PAH surrogate recovery for 2-fluorobiphenyl (954%) does not meet QC criteria due to sample dilution (100X).

15-RBY-SB-10-4 (1158702012) PS

AK102 - Surrogate recoveries for 5a-androstane (0%) do not meet QC criteria due to sample dilution (10X).
 AK101 - Surrogate recovery for 4-bromofluorobenzene (3290%) does not meet QC criteria due to matrix interference.

15-RBY-SD-10-4 (1158702013) PS

AK102 - Surrogate recoveries for 5a-androstane (0%) do not meet QC criteria due to sample dilution (10X).
 AK101 - Surrogate recovery for 4-bromofluorobenzene (1990%) does not meet QC criteria due to matrix interference.

15-RBY-SB-16-4 (1158702016) PS

AK102 - Surrogate recoveries for 5a-androstane (0%) do not meet QC criteria due to sample dilution (10X).
 AK101 - Surrogate recovery for 4-bromofluorobenzene (1490%) does not meet QC criteria due to matrix interference.

15-RBY-SD-16-4 (1158702017) PS

AK102 - Surrogate recoveries for 5a-androstane (0%) do not meet QC criteria due to sample dilution (4 X).
 AK101/8021B - Sample analyzed outside of hold time to the hour but within the same day.
 AK101 - Surrogate recovery for 4-bromofluorobenzene (1910 %) does not meet QC criteria due to matrix interference.

LCS for HBN 1722618 [VXX/28064 (1297312) LCS

8260B - LCS recoveries for several analytes do not meet QC criteria (biased high). These analytes were not detected above the LOQ in the associated samples.

LCSD for HBN 1722332 [VXX/2804 (1296776) LCSD

8260B - LCS/LCSD RPD for several analytes does not meet QC criteria. These analytes were not detected above the LOQ in the associated samples.

8260B - LCSD recoveries for 1,1 Dichloroethene and Carbon disulfide do not meet QC criteria (140% and 134% respectively). These analytes were not detected above the LOQ in the associated samples.

15TFTPL051SS(1155236043MS) (1296251) MS

8270D SIM - MS recovery for 1-methylnaphthalene (42%) and 2-methylnaphthalene (31.1%) does not meet QC criteria.
 See LCS for accuracy requirements.

15-RBY-CS-18-1(1158702018MS) (1297313) MS

8260B - MS recovery for Hexachlorobutadiene does not meet QC criteria. Refer to LCS for accuracy.

Case Narrative

SGS Client: **Ahtna Engineering Svs**
SGS Project: **1158702**
Project Name/Site: **Ruby PACP 20266.014**
Project Contact: **Andrew Weller**

15-RBY-CS-18-1(1158702018MSD) (1297314) MSD

8260B - MS/MSD recoveries for several analytes do not meet QC criteria. Refer to LCS for accuracy.
8260B - MS/MSD RPD for several analytes do not meet QC criteria. These analytes were not detected above the LOQ in the associated samples.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 10/27/2015 2:43:58PM

Report of Manual Integrations

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analytical Batch</u>	<u>Analyte</u>	<u>Reason</u>
8270D SIMS (PAH)				
1298088	CVC for HBN 1722766 [XMS/8982]	XMS8982	Anthracene	RP
1298088	CVC for HBN 1722766 [XMS/8982]	XMS8982	Benzo[a]pyrene	RP
1298088	CVC for HBN 1722766 [XMS/8982]	XMS8982	Benzo[k]fluoranthene	RP
1298088	CVC for HBN 1722766 [XMS/8982]	XMS8982	Chrysene	RP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

Print Date: 10/27/2015 2:44:00PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
15-RBY-TP-01-10	1158702001	09/28/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-TP-01-3	1158702002	09/28/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-TP-02-9.5	1158702003	09/28/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-TP-02-4	1158702004	09/28/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-TP-12-4	1158702005	09/28/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SB-01-4	1158702006	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SB-02-4	1158702007	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SB-04-4	1158702008	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SB-06-4	1158702009	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SB-07-4	1158702010	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SB-08-4	1158702011	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SB-10-4	1158702012	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SD-10-4	1158702013	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SB-12-4	1158702014	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SB-14-4	1158702015	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SB-16-4	1158702016	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-SD-16-4	1158702017	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-CS-18-1	1158702018	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-CS-19-1	1158702019	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-CS-21-1	1158702020	09/29/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-CS-24-1	1158702021	09/30/2015	10/03/2015	Soil/Solid (dry weight)
15-RBY-CS-26-1	1158702022	09/30/2015	10/03/2015	Soil/Solid (dry weight)
Trip Blank A	1158702023	09/28/2015	10/03/2015	Soil/Solid (dry weight)
Trip Blank B	1158702024	09/28/2015	10/03/2015	Soil/Solid (dry weight)

Method

8270D SIMS (PAH)
AK101
SW8021B
AK102
AK101
SM21 2540G
SW8260B

Method Description

8270 PAH SIM Semi-Volatiles GC/MS
AK101/8021 Combo. (S)
AK101/8021 Combo. (S)
Diesel Range Organics (S)
Gasoline Range Organics (S)
Percent Solids SM2540G
VOC 8260 (S) Field Extracted

Detectable Results Summary

Client Sample ID: **15-RBY-TP-01-10**

Lab Sample ID: 1158702001

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	95.5	mg/Kg
Gasoline Range Organics	5.46	mg/Kg
o-Xylene	37.4	ug/Kg
P & M -Xylene	47.2J	ug/Kg

Client Sample ID: **15-RBY-TP-01-3**

Lab Sample ID: 1158702002

Polynuclear Aromatics GC/MS

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	4130	ug/Kg
2-Methylnaphthalene	4930	ug/Kg
Naphthalene	1840	ug/Kg
Phenanthrene	446	ug/Kg
Diesel Range Organics	3340	mg/Kg
Benzene	6.86J	ug/Kg
Ethylbenzene	321	ug/Kg
Gasoline Range Organics	164	mg/Kg
o-Xylene	3610	ug/Kg
P & M -Xylene	4570	ug/Kg
Toluene	90.5	ug/Kg

Client Sample ID: **15-RBY-TP-02-9.5**

Lab Sample ID: 1158702003

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	40.2	mg/Kg
Benzene	7.66J	ug/Kg
Gasoline Range Organics	1.69J	mg/Kg
o-Xylene	15.0J	ug/Kg
P & M -Xylene	29.3J	ug/Kg
Toluene	17.4J	ug/Kg

Client Sample ID: **15-RBY-TP-02-4**

Lab Sample ID: 1158702004

Polynuclear Aromatics GC/MS

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	90400	ug/Kg
2-Methylnaphthalene	95700	ug/Kg
Naphthalene	32000	ug/Kg
Phenanthrene	872	ug/Kg
Diesel Range Organics	20600	mg/Kg
Ethylbenzene	1440	ug/Kg
Gasoline Range Organics	655	mg/Kg
o-Xylene	35300	ug/Kg
P & M -Xylene	24800	ug/Kg
Toluene	612	ug/Kg

Detectable Results Summary

Client Sample ID: **15-RBY-TP-12-4**

Lab Sample ID: 1158702005

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	92100	ug/Kg
2-Methylnaphthalene	98800	ug/Kg
Naphthalene	32600	ug/Kg
Phenanthrene	981	ug/Kg
Diesel Range Organics	25200	mg/Kg
Ethylbenzene	1380	ug/Kg
Gasoline Range Organics	633	mg/Kg
o-Xylene	35000	ug/Kg
P & M -Xylene	24300	ug/Kg
Toluene	506	ug/Kg

Semivolatile Organic Fuels

Volatile Fuels

Client Sample ID: **15-RBY-SB-01-4**

Lab Sample ID: 1158702006

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	12.9J	mg/Kg
o-Xylene	17.9J	ug/Kg
P & M -Xylene	34.3J	ug/Kg
Toluene	24.8J	ug/Kg

Client Sample ID: **15-RBY-SB-02-4**

Lab Sample ID: 1158702007

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	23.0J	mg/Kg
Gasoline Range Organics	3.16J	mg/Kg

Client Sample ID: **15-RBY-SB-04-4**

Lab Sample ID: 1158702008

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	21.2J	mg/Kg
Gasoline Range Organics	1.77J	mg/Kg

Client Sample ID: **15-RBY-SB-06-4**

Lab Sample ID: 1158702009

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	1.45J	mg/Kg

Client Sample ID: **15-RBY-SB-10-4**

Lab Sample ID: 1158702012

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	33600	mg/Kg
Benzene	5800	ug/Kg
Ethylbenzene	16700	ug/Kg
Gasoline Range Organics	831	mg/Kg
o-Xylene	45800	ug/Kg
P & M -Xylene	70200	ug/Kg
Toluene	34500	ug/Kg

Detectable Results Summary

Client Sample ID: **15-RBY-SD-10-4**

Lab Sample ID: 1158702013

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	35300	mg/Kg
Benzene	5330	ug/Kg
Ethylbenzene	13300	ug/Kg
Gasoline Range Organics	596	mg/Kg
o-Xylene	35800	ug/Kg
P & M -Xylene	54200	ug/Kg
Toluene	28700	ug/Kg

Client Sample ID: **15-RBY-SB-12-4**

Lab Sample ID: 1158702014

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	26.7	mg/Kg
Benzene	10.6J	ug/Kg
Ethylbenzene	31.9J	ug/Kg
Gasoline Range Organics	1.95J	mg/Kg
o-Xylene	56.2	ug/Kg
P & M -Xylene	118	ug/Kg
Toluene	65.6	ug/Kg

Client Sample ID: **15-RBY-SB-14-4**

Lab Sample ID: 1158702015

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	27.5	mg/Kg
Gasoline Range Organics	2.90J	mg/Kg

Client Sample ID: **15-RBY-SB-16-4**

Lab Sample ID: 1158702016

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	12200	mg/Kg
Benzene	21.0J	ug/Kg
Ethylbenzene	695	ug/Kg
Gasoline Range Organics	363	mg/Kg
o-Xylene	13600	ug/Kg
P & M -Xylene	2640	ug/Kg
Toluene	128	ug/Kg

Client Sample ID: **15-RBY-SD-16-4**

Lab Sample ID: 1158702017

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	14500	mg/Kg
Benzene	8.67J	ug/Kg
Ethylbenzene	460	ug/Kg
Gasoline Range Organics	378	mg/Kg
o-Xylene	11300	ug/Kg
P & M -Xylene	2060	ug/Kg
Toluene	51.5J	ug/Kg

Client Sample ID: **15-RBY-CS-18-1**

Lab Sample ID: 1158702018

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	13.1J	mg/Kg
Gasoline Range Organics	6.37	mg/Kg

Print Date: 10/27/2015 2:44:03PM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Member of SGS Group

Detectable Results Summary

Client Sample ID: **15-RBY-CS-19-1**

Lab Sample ID: 1158702019

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	32.8	mg/Kg
Gasoline Range Organics	2.55J	mg/Kg

Client Sample ID: **15-RBY-CS-21-1**

Lab Sample ID: 1158702020

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	56.2	mg/Kg
Gasoline Range Organics	1.71J	mg/Kg

Client Sample ID: **15-RBY-CS-24-1**

Lab Sample ID: 1158702021

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	15.6J	mg/Kg
Gasoline Range Organics	1.21J	mg/Kg

Client Sample ID: **Trip Blank A**

Lab Sample ID: 1158702023

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	1.59J	mg/Kg

Results of 15-RBY-TP-01-10

Client Sample ID: **15-RBY-TP-01-10**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702001
 Lab Project ID: 1158702

Collection Date: 09/28/15 14:10
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):87.4
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	95.5	22.7	7.03	mg/Kg	1		10/08/15 23:45
Surrogates							
5a Androstane (surr)	79.3	50-150		%	1		10/08/15 23:45

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/08/15 23:45
 Container ID: 1158702001-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.261 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-TP-01-10

Client Sample ID: **15-RBY-TP-01-10**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702001
 Lab Project ID: 1158702

Collection Date: 09/28/15 14:10
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):87.4
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	5.46	3.53	1.06	mg/Kg	1		10/11/15 20:26

Surrogates

4-Bromofluorobenzene (surr)	143	50-150		%	1		10/11/15 20:26
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Batch Information

Analytical Batch: VFC12737
 Analytical Method: AK101
 Analyst: KAS
 Analytical Date/Time: 10/11/15 20:26
 Container ID: 1158702001-B

Prep Batch: VXX28062
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 14:10
 Prep Initial Wt./Vol.: 50.93 g
 Prep Extract Vol: 31.4016 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	8.80 U	17.6	5.64	ug/Kg	1		10/11/15 20:26
Ethylbenzene	17.6 U	35.3	11.0	ug/Kg	1		10/11/15 20:26
o-Xylene	37.4	35.3	11.0	ug/Kg	1		10/11/15 20:26
P & M -Xylene	47.2 J	70.5	21.2	ug/Kg	1		10/11/15 20:26
Toluene	17.6 U	35.3	11.0	ug/Kg	1		10/11/15 20:26

Surrogates

1,4-Difluorobenzene (surr)	95	72-119		%	1		10/11/15 20:26
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Batch Information

Analytical Batch: VFC12737
 Analytical Method: SW8021B
 Analyst: KAS
 Analytical Date/Time: 10/11/15 20:26
 Container ID: 1158702001-B

Prep Batch: VXX28062
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 14:10
 Prep Initial Wt./Vol.: 50.93 g
 Prep Extract Vol: 31.4016 mL

Results of 15-RBY-TP-01-3

Client Sample ID: **15-RBY-TP-01-3**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702002
 Lab Project ID: 1158702

Collection Date: 09/28/15 14:25
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):85.2
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	4130	292	87.7	ug/Kg	50		10/26/15 06:17
2-Methylnaphthalene	4930	292	87.7	ug/Kg	50		10/26/15 06:17
Acenaphthene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Acenaphthylene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Anthracene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Benzo(a)Anthracene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Benzo[a]pyrene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Benzo[b]Fluoranthene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Benzo[g,h,i]perylene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Benzo[k]fluoranthene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Chrysene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Dibenzo[a,h]anthracene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Fluoranthene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Fluorene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Indeno[1,2,3-c,d] pyrene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Naphthalene	1840	292	87.7	ug/Kg	50		10/26/15 06:17
Phenanthrene	446	292	87.7	ug/Kg	50		10/26/15 06:17
Pyrene	146 U	292	87.7	ug/Kg	50		10/26/15 06:17
Surrogates							
2-Fluorobiphenyl (surr)	156 *	46-115		%	50		10/26/15 06:17
Terphenyl-d14 (surr)	85.2	58-113		%	50		10/26/15 06:17

Batch Information

Analytical Batch: XMS9008
 Analytical Method: 8270D SIMS (PAH)
 Analyst: NRB
 Analytical Date/Time: 10/26/15 06:17
 Container ID: 1158702002-A

Prep Batch: XXX34360
 Prep Method: SW3550C
 Prep Date/Time: 10/08/15 12:59
 Prep Initial Wt./Vol.: 22.571 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-TP-01-3

Client Sample ID: **15-RBY-TP-01-3**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702002
 Lab Project ID: 1158702

Collection Date: 09/28/15 14:25
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):85.2
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	3340	234	72.5	mg/Kg	10		10/09/15 12:54
Surrogates							
5a Androstane (surr)	88.3	50-150		%	10		10/09/15 12:54

Batch Information

Analytical Batch: XFC12147
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 12:54
 Container ID: 1158702002-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.08 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-TP-01-3

Client Sample ID: **15-RBY-TP-01-3**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702002
 Lab Project ID: 1158702

Collection Date: 09/28/15 14:25
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):85.2
 Location:

Results by Volatile Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	164	34.3	10.3	mg/Kg	10		10/11/15 20:07

Surrogates

4-Bromofluorobenzene (surr)	1740 *	50-150		%	10		10/11/15 20:07
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Batch Information

Analytical Batch: VFC12737
 Analytical Method: AK101
 Analyst: KAS
 Analytical Date/Time: 10/11/15 20:07
 Container ID: 1158702002-B

Prep Batch: VXX28062
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 14:25
 Prep Initial Wt./Vol.: 57.249 g
 Prep Extract Vol: 33.4545 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	6.86 J	17.1	5.48	ug/Kg	1		10/09/15 03:56
Ethylbenzene	321	34.3	10.7	ug/Kg	1		10/09/15 03:56
o-Xylene	3610	34.3	10.7	ug/Kg	1		10/09/15 03:56
P & M -Xylene	4570	68.6	20.6	ug/Kg	1		10/09/15 03:56
Toluene	90.5	34.3	10.7	ug/Kg	1		10/09/15 03:56

Surrogates

1,4-Difluorobenzene (surr)	109	72-119		%	1		10/09/15 03:56
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 03:56
 Container ID: 1158702002-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 14:25
 Prep Initial Wt./Vol.: 57.249 g
 Prep Extract Vol: 33.4545 mL

Results of 15-RBY-TP-02-9.5

Client Sample ID: **15-RBY-TP-02-9.5**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702003
 Lab Project ID: 1158702

Collection Date: 09/28/15 15:40
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):79.3
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	40.2	25.2	7.82	mg/Kg	1		10/09/15 00:05
Surrogates							
5a Androstane (surr)	80.7	50-150		%	1		10/09/15 00:05

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 00:05
 Container ID: 1158702003-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.025 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-TP-02-9.5

Client Sample ID: **15-RBY-TP-02-9.5**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702003
 Lab Project ID: 1158702

Collection Date: 09/28/15 15:40
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):79.3
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.69 J	3.48	1.05	mg/Kg	1		10/09/15 04:54

Surrogates

4-Bromofluorobenzene (surr)	118	50-150		%	1		10/09/15 04:54
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/09/15 04:54
 Container ID: 1158702003-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 15:40
 Prep Initial Wt./Vol.: 72.52 g
 Prep Extract Vol: 40.0472 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	7.66 J	17.4	5.57	ug/Kg	1		10/09/15 04:54
Ethylbenzene	17.4 U	34.8	10.9	ug/Kg	1		10/09/15 04:54
o-Xylene	15.0 J	34.8	10.9	ug/Kg	1		10/09/15 04:54
P & M -Xylene	29.3 J	69.7	20.9	ug/Kg	1		10/09/15 04:54
Toluene	17.4 J	34.8	10.9	ug/Kg	1		10/09/15 04:54

Surrogates

1,4-Difluorobenzene (surr)	105	72-119		%	1		10/09/15 04:54
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 04:54
 Container ID: 1158702003-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 15:40
 Prep Initial Wt./Vol.: 72.52 g
 Prep Extract Vol: 40.0472 mL

Results of 15-RBY-TP-02-4

Client Sample ID: **15-RBY-TP-02-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702004
 Lab Project ID: 1158702

Collection Date: 09/28/15 16:05
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%): 78.3
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	90400	6310	1890	ug/Kg	1000		10/26/15 19:29
2-Methylnaphthalene	95700	6310	1890	ug/Kg	1000		10/26/15 19:29
Acenaphthene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Acenaphthylene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Anthracene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Benzo(a)Anthracene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Benzo[a]pyrene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Benzo[b]Fluoranthene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Benzo[g,h,i]perylene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Benzo[k]fluoranthene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Chrysene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Dibenzo[a,h]anthracene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Fluoranthene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Fluorene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Indeno[1,2,3-c,d] pyrene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Naphthalene	32000	6310	1890	ug/Kg	1000		10/26/15 19:29
Phenanthrene	872	631	189	ug/Kg	100		10/26/15 05:45
Pyrene	316 U	631	189	ug/Kg	100		10/26/15 05:45
Surrogates							
2-Fluorobiphenyl (surr)	894 *	46-115		%	100		10/26/15 05:45
Terphenyl-d14 (surr)	75.7	58-113		%	100		10/26/15 05:45

Batch Information

Analytical Batch: XMS9008
 Analytical Method: 8270D SIMS (PAH)
 Analyst: NRB
 Analytical Date/Time: 10/26/15 05:45
 Container ID: 1158702004-A

Prep Batch: XXX34360
 Prep Method: SW3550C
 Prep Date/Time: 10/08/15 12:59
 Prep Initial Wt./Vol.: 22.766 g
 Prep Extract Vol: 1 mL

Analytical Batch: XMS9009
 Analytical Method: 8270D SIMS (PAH)
 Analyst: NRB
 Analytical Date/Time: 10/26/15 19:29
 Container ID: 1158702004-A

Prep Batch: XXX34360
 Prep Method: SW3550C
 Prep Date/Time: 10/08/15 12:59
 Prep Initial Wt./Vol.: 22.766 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-TP-02-4

Client Sample ID: **15-RBY-TP-02-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702004
 Lab Project ID: 1158702

Collection Date: 09/28/15 16:05
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):78.3
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	20600		1270	392	mg/Kg	10		10/09/15 13:14
Surrogates								
5a Androstane (surr)	0	*	50-150		%	10		10/09/15 13:14

Batch Information

Analytical Batch: XFC12147
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 13:14
 Container ID: 1158702004-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.278 g
 Prep Extract Vol: 5 mL

Results of 15-RBY-TP-02-4

Client Sample ID: **15-RBY-TP-02-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702004
 Lab Project ID: 1158702

Collection Date: 09/28/15 16:05
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):78.3
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	655	53.3	16.0	mg/Kg	10		10/09/15 05:13

Surrogates

4-Bromofluorobenzene (surr)	2500 *	50-150		%	10		10/09/15 05:13
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/09/15 05:13
 Container ID: 1158702004-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 16:05
 Prep Initial Wt./Vol.: 40.583 g
 Prep Extract Vol: 33.824 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	133 U	266	85.2	ug/Kg	10		10/09/15 05:13
Ethylbenzene	1440	533	166	ug/Kg	10		10/09/15 05:13
o-Xylene	35300	533	166	ug/Kg	10		10/09/15 05:13
P & M -Xylene	24800	1070	320	ug/Kg	10		10/09/15 05:13
Toluene	612	533	166	ug/Kg	10		10/09/15 05:13

Surrogates

1,4-Difluorobenzene (surr)	109	72-119		%	10		10/09/15 05:13
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 05:13
 Container ID: 1158702004-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 16:05
 Prep Initial Wt./Vol.: 40.583 g
 Prep Extract Vol: 33.824 mL

Results of 15-RBY-TP-12-4

Client Sample ID: **15-RBY-TP-12-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702005
 Lab Project ID: 1158702

Collection Date: 09/28/15 16:15
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%): 78.2
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	92100	6300	1890	ug/Kg	1000		10/26/15 19:45
2-Methylnaphthalene	98800	6300	1890	ug/Kg	1000		10/26/15 19:45
Acenaphthene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Acenaphthylene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Anthracene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Benzo(a)Anthracene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Benzo[a]pyrene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Benzo[b]Fluoranthene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Benzo[g,h,i]perylene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Benzo[k]fluoranthene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Chrysene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Dibenzo[a,h]anthracene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Fluoranthene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Fluorene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Indeno[1,2,3-c,d] pyrene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Naphthalene	32600	6300	1890	ug/Kg	1000		10/26/15 19:45
Phenanthrene	981	630	189	ug/Kg	100		10/26/15 06:01
Pyrene	315 U	630	189	ug/Kg	100		10/26/15 06:01
Surrogates							
2-Fluorobiphenyl (surr)	954 *	46-115		%	100		10/26/15 06:01
Terphenyl-d14 (surr)	74.9	58-113		%	100		10/26/15 06:01

Batch Information

Analytical Batch: XMS9008
 Analytical Method: 8270D SIMS (PAH)
 Analyst: NRB
 Analytical Date/Time: 10/26/15 06:01
 Container ID: 1158702005-A

Prep Batch: XXX34360
 Prep Method: SW3550C
 Prep Date/Time: 10/08/15 12:59
 Prep Initial Wt./Vol.: 22.842 g
 Prep Extract Vol: 1 mL

Analytical Batch: XMS9009
 Analytical Method: 8270D SIMS (PAH)
 Analyst: NRB
 Analytical Date/Time: 10/26/15 19:45
 Container ID: 1158702005-A

Prep Batch: XXX34360
 Prep Method: SW3550C
 Prep Date/Time: 10/08/15 12:59
 Prep Initial Wt./Vol.: 22.842 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-TP-12-4

Client Sample ID: **15-RBY-TP-12-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702005
 Lab Project ID: 1158702

Collection Date: 09/28/15 16:15
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):78.2
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	25200		1270	394	mg/Kg	10		10/09/15 13:24
Surrogates								
5a Androstane (surr)	0	*	50-150		%	10		10/09/15 13:24

Batch Information

Analytical Batch: XFC12147
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 13:24
 Container ID: 1158702005-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.215 g
 Prep Extract Vol: 5 mL

Results of 15-RBY-TP-12-4

Client Sample ID: **15-RBY-TP-12-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702005
 Lab Project ID: 1158702

Collection Date: 09/28/15 16:15
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):78.2
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	633	50.1	15.0	mg/Kg	10		10/09/15 05:32

Surrogates

4-Bromofluorobenzene (surr)	2590 *	50-150		%	10		10/09/15 05:32
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/09/15 05:32
 Container ID: 1158702005-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 16:15
 Prep Initial Wt./Vol.: 44.319 g
 Prep Extract Vol: 34.6837 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	125 U	250	80.1	ug/Kg	10		10/09/15 05:32
Ethylbenzene	1380	501	156	ug/Kg	10		10/09/15 05:32
o-Xylene	35000	501	156	ug/Kg	10		10/09/15 05:32
P & M -Xylene	24300	1000	300	ug/Kg	10		10/09/15 05:32
Toluene	506	501	156	ug/Kg	10		10/09/15 05:32

Surrogates

1,4-Difluorobenzene (surr)	109	72-119		%	10		10/09/15 05:32
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 05:32
 Container ID: 1158702005-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 16:15
 Prep Initial Wt./Vol.: 44.319 g
 Prep Extract Vol: 34.6837 mL

Results of 15-RBY-SB-01-4

Client Sample ID: **15-RBY-SB-01-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702006
 Lab Project ID: 1158702

Collection Date: 09/29/15 09:35
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):86.3
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12.9 J	22.9	7.10	mg/Kg	1		10/09/15 00:35
Surrogates							
5a Androstane (surr)	72.5	50-150		%	1		10/09/15 00:35

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 00:35
 Container ID: 1158702006-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.371 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-SB-01-4

Client Sample ID: **15-RBY-SB-01-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702006
 Lab Project ID: 1158702

Collection Date: 09/29/15 09:35
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):86.3
 Location:

Results by Volatile Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.91 U	3.81	1.14	mg/Kg	1		10/09/15 02:58

Surrogates

4-Bromofluorobenzene (surr)	101	50-150		%	1		10/09/15 02:58
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/09/15 02:58
 Container ID: 1158702006-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 09:35
 Prep Initial Wt./Vol.: 48.076 g
 Prep Extract Vol: 31.592 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	9.50 U	19.0	6.09	ug/Kg	1		10/09/15 02:58
Ethylbenzene	19.1 U	38.1	11.9	ug/Kg	1		10/09/15 02:58
o-Xylene	17.9 J	38.1	11.9	ug/Kg	1		10/09/15 02:58
P & M -Xylene	34.3 J	76.2	22.8	ug/Kg	1		10/09/15 02:58
Toluene	24.8 J	38.1	11.9	ug/Kg	1		10/09/15 02:58

Surrogates

1,4-Difluorobenzene (surr)	104	72-119		%	1		10/09/15 02:58
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 02:58
 Container ID: 1158702006-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 09:35
 Prep Initial Wt./Vol.: 48.076 g
 Prep Extract Vol: 31.592 mL

Results of 15-RBY-SB-02-4

Client Sample ID: **15-RBY-SB-02-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702007
 Lab Project ID: 1158702

Collection Date: 09/29/15 09:47
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):82.1
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	23.0 J	24.1	7.46	mg/Kg	1		10/09/15 00:45
Surrogates							
5a Androstane (surr)	85.8	50-150		%	1		10/09/15 00:45

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 00:45
 Container ID: 1158702007-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.385 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-SB-02-4

Client Sample ID: **15-RBY-SB-02-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702007
 Lab Project ID: 1158702

Collection Date: 09/29/15 09:47
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):82.1
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	3.16 J	3.67	1.10	mg/Kg	1		10/09/15 05:52

Surrogates

4-Bromofluorobenzene (surr)	120	50-150		%	1		10/09/15 05:52
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/09/15 05:52
 Container ID: 1158702007-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 09:47
 Prep Initial Wt./Vol.: 59.014 g
 Prep Extract Vol: 35.5797 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	9.20 U	18.4	5.88	ug/Kg	1		10/09/15 05:52
Ethylbenzene	18.4 U	36.7	11.5	ug/Kg	1		10/09/15 05:52
o-Xylene	18.4 U	36.7	11.5	ug/Kg	1		10/09/15 05:52
P & M -Xylene	36.8 U	73.5	22.0	ug/Kg	1		10/09/15 05:52
Toluene	18.4 U	36.7	11.5	ug/Kg	1		10/09/15 05:52

Surrogates

1,4-Difluorobenzene (surr)	105	72-119		%	1		10/09/15 05:52
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 05:52
 Container ID: 1158702007-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 09:47
 Prep Initial Wt./Vol.: 59.014 g
 Prep Extract Vol: 35.5797 mL

Results of 15-RBY-SB-04-4

Client Sample ID: **15-RBY-SB-04-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702008
 Lab Project ID: 1158702

Collection Date: 09/29/15 10:07
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):86.1
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	21.2 J	23.1	7.16	mg/Kg	1		10/09/15 01:14
Surrogates							
5a Androstane (surr)	71	50-150		%	1		10/09/15 01:14

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 01:14
 Container ID: 1158702008-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.163 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-SB-04-4

Client Sample ID: **15-RBY-SB-04-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702008
 Lab Project ID: 1158702

Collection Date: 09/29/15 10:07
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):86.1
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.77 J	3.53	1.06	mg/Kg	1		10/09/15 06:11

Surrogates

4-Bromofluorobenzene (surr)	109	50-150		%	1		10/09/15 06:11
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/09/15 06:11
 Container ID: 1158702008-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 10:07
 Prep Initial Wt./Vol.: 53.255 g
 Prep Extract Vol: 32.3934 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	8.85 U	17.7	5.65	ug/Kg	1		10/09/15 06:11
Ethylbenzene	17.6 U	35.3	11.0	ug/Kg	1		10/09/15 06:11
o-Xylene	17.6 U	35.3	11.0	ug/Kg	1		10/09/15 06:11
P & M -Xylene	35.3 U	70.6	21.2	ug/Kg	1		10/09/15 06:11
Toluene	17.6 U	35.3	11.0	ug/Kg	1		10/09/15 06:11

Surrogates

1,4-Difluorobenzene (surr)	106	72-119		%	1		10/09/15 06:11
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 06:11
 Container ID: 1158702008-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 10:07
 Prep Initial Wt./Vol.: 53.255 g
 Prep Extract Vol: 32.3934 mL

Results of 15-RBY-SB-06-4

Client Sample ID: **15-RBY-SB-06-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702009
 Lab Project ID: 1158702

Collection Date: 09/29/15 10:41
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.5
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12.2 U	24.3	7.53	mg/Kg	1		10/09/15 01:24
Surrogates							
5a Androstane (surr)	83.1	50-150		%	1		10/09/15 01:24

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 01:24
 Container ID: 1158702009-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.279 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-SB-06-4

Client Sample ID: **15-RBY-SB-06-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702009
 Lab Project ID: 1158702

Collection Date: 09/29/15 10:41
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.5
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.45 J	3.77	1.13	mg/Kg	1		10/09/15 06:30

Surrogates

4-Bromofluorobenzene (surr)	106	50-150		%	1		10/09/15 06:30
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/09/15 06:30
 Container ID: 1158702009-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 10:41
 Prep Initial Wt./Vol.: 58.05 g
 Prep Extract Vol: 35.7112 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	9.45 U	18.9	6.04	ug/Kg	1		10/09/15 06:30
Ethylbenzene	18.9 U	37.7	11.8	ug/Kg	1		10/09/15 06:30
o-Xylene	18.9 U	37.7	11.8	ug/Kg	1		10/09/15 06:30
P & M -Xylene	37.7 U	75.4	22.6	ug/Kg	1		10/09/15 06:30
Toluene	18.9 U	37.7	11.8	ug/Kg	1		10/09/15 06:30

Surrogates

1,4-Difluorobenzene (surr)	106	72-119		%	1		10/09/15 06:30
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 06:30
 Container ID: 1158702009-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 10:41
 Prep Initial Wt./Vol.: 58.05 g
 Prep Extract Vol: 35.7112 mL

Results of 15-RBY-SB-07-4

Client Sample ID: **15-RBY-SB-07-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702010
 Lab Project ID: 1158702

Collection Date: 09/29/15 10:53
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.0
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12.4 U	24.7	7.65	mg/Kg	1		10/09/15 01:34
Surrogates							
5a Androstane (surr)	89.1	50-150		%	1		10/09/15 01:34

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 01:34
 Container ID: 1158702010-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.026 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-SB-07-4

Client Sample ID: **15-RBY-SB-07-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702010
 Lab Project ID: 1158702

Collection Date: 09/29/15 10:53
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.0
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.74 U	3.47	1.04	mg/Kg	1		10/09/15 06:50

Surrogates

4-Bromofluorobenzene (surr)	105	50-150		%	1		10/09/15 06:50
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/09/15 06:50
 Container ID: 1158702010-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 10:53
 Prep Initial Wt./Vol.: 67.302 g
 Prep Extract Vol: 37.8021 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	8.65 U	17.3	5.55	ug/Kg	1		10/09/15 06:50
Ethylbenzene	17.4 U	34.7	10.8	ug/Kg	1		10/09/15 06:50
o-Xylene	17.4 U	34.7	10.8	ug/Kg	1		10/09/15 06:50
P & M -Xylene	34.7 U	69.4	20.8	ug/Kg	1		10/09/15 06:50
Toluene	17.4 U	34.7	10.8	ug/Kg	1		10/09/15 06:50

Surrogates

1,4-Difluorobenzene (surr)	105	72-119		%	1		10/09/15 06:50
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 06:50
 Container ID: 1158702010-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 10:53
 Prep Initial Wt./Vol.: 67.302 g
 Prep Extract Vol: 37.8021 mL

Results of 15-RBY-SB-08-4

Client Sample ID: **15-RBY-SB-08-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702011
 Lab Project ID: 1158702

Collection Date: 09/29/15 11:07
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.8
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12.2 U	24.3	7.53	mg/Kg	1		10/09/15 01:44
Surrogates							
5a Androstane (surr)	91.8	50-150		%	1		10/09/15 01:44

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 01:44
 Container ID: 1158702011-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.204 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-SB-08-4

Client Sample ID: **15-RBY-SB-08-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702011
 Lab Project ID: 1158702

Collection Date: 09/29/15 11:07
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.8
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.95 U	3.90	1.17	mg/Kg	1		10/09/15 07:09

Surrogates

4-Bromofluorobenzene (surr)	101	50-150		%	1		10/09/15 07:09
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/09/15 07:09
 Container ID: 1158702011-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 11:07
 Prep Initial Wt./Vol.: 54.934 g
 Prep Extract Vol: 35.0223 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	9.75 U	19.5	6.24	ug/Kg	1		10/09/15 07:09
Ethylbenzene	19.5 U	39.0	12.2	ug/Kg	1		10/09/15 07:09
o-Xylene	19.5 U	39.0	12.2	ug/Kg	1		10/09/15 07:09
P & M -Xylene	39.0 U	78.0	23.4	ug/Kg	1		10/09/15 07:09
Toluene	19.5 U	39.0	12.2	ug/Kg	1		10/09/15 07:09

Surrogates

1,4-Difluorobenzene (surr)	105	72-119		%	1		10/09/15 07:09
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 07:09
 Container ID: 1158702011-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 11:07
 Prep Initial Wt./Vol.: 54.934 g
 Prep Extract Vol: 35.0223 mL

Results of 15-RBY-SB-10-4

Client Sample ID: **15-RBY-SB-10-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702012
 Lab Project ID: 1158702

Collection Date: 09/29/15 13:25
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):80.4
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	33600		1230	381	mg/Kg	10		10/09/15 13:34
Surrogates								
5a Androstane (surr)	0	*	50-150		%	10		10/09/15 13:34

Batch Information

Analytical Batch: XFC12147
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 13:34
 Container ID: 1158702012-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.398 g
 Prep Extract Vol: 5 mL

Results of 15-RBY-SB-10-4

Client Sample ID: **15-RBY-SB-10-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702012
 Lab Project ID: 1158702

Collection Date: 09/29/15 13:25
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):80.4
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	831	37.4	11.2	mg/Kg	10		10/09/15 07:28

Surrogates

4-Bromofluorobenzene (surr)	3290 *	50-150		%	10		10/09/15 07:28
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/09/15 07:28
 Container ID: 1158702012-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 13:25
 Prep Initial Wt./Vol.: 61.724 g
 Prep Extract Vol: 37.0994 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	5800	187	59.8	ug/Kg	10		10/09/15 07:28
Ethylbenzene	16700	374	117	ug/Kg	10		10/09/15 07:28
o-Xylene	45800	374	117	ug/Kg	10		10/09/15 07:28
P & M -Xylene	70200	748	224	ug/Kg	10		10/09/15 07:28
Toluene	34500	374	117	ug/Kg	10		10/09/15 07:28

Surrogates

1,4-Difluorobenzene (surr)	114	72-119		%	10		10/09/15 07:28
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Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/09/15 07:28
 Container ID: 1158702012-B

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 13:25
 Prep Initial Wt./Vol.: 61.724 g
 Prep Extract Vol: 37.0994 mL

Results of 15-RBY-SD-10-4

Client Sample ID: **15-RBY-SD-10-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702013
 Lab Project ID: 1158702

Collection Date: 09/29/15 13:35
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):80.5
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	35300		1230	381	mg/Kg	10		10/09/15 13:44
Surrogates								
5a Androstane (surr)	0	*	50-150		%	10		10/09/15 13:44

Batch Information

Analytical Batch: XFC12147
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 13:44
 Container ID: 1158702013-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.303 g
 Prep Extract Vol: 5 mL

Results of 15-RBY-SD-10-4

Client Sample ID: **15-RBY-SD-10-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702013
 Lab Project ID: 1158702

Collection Date: 09/29/15 13:35
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):80.5
 Location:

Results by Volatile Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	596	47.6	14.3	mg/Kg	10		10/13/15 19:03

Surrogates

4-Bromofluorobenzene (surr)	1990 *	50-150		%	10		10/13/15 19:03
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Batch Information

Analytical Batch: VFC12743
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/13/15 19:03
 Container ID: 1158702013-B

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 13:35
 Prep Initial Wt./Vol.: 43.739 g
 Prep Extract Vol: 33.5405 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	5330	238	76.2	ug/Kg	10		10/13/15 19:03
Ethylbenzene	13300	476	149	ug/Kg	10		10/13/15 19:03
o-Xylene	35800	476	149	ug/Kg	10		10/13/15 19:03
P & M -Xylene	54200	953	286	ug/Kg	10		10/13/15 19:03
Toluene	28700	476	149	ug/Kg	10		10/13/15 19:03

Surrogates

1,4-Difluorobenzene (surr)	97.4	72-119		%	10		10/13/15 19:03
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Batch Information

Analytical Batch: VFC12743
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/13/15 19:03
 Container ID: 1158702013-B

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 13:35
 Prep Initial Wt./Vol.: 43.739 g
 Prep Extract Vol: 33.5405 mL

Results of 15-RBY-SB-12-4

Client Sample ID: **15-RBY-SB-12-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702014
 Lab Project ID: 1158702

Collection Date: 09/29/15 13:50
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):78.7
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	26.7	25.2	7.80	mg/Kg	1		10/09/15 02:14
Surrogates							
5a Androstane (surr)	77.5	50-150		%	1		10/09/15 02:14

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 02:14
 Container ID: 1158702014-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.297 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-SB-12-4

Client Sample ID: **15-RBY-SB-12-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702014
 Lab Project ID: 1158702

Collection Date: 09/29/15 13:50
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):78.7
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.95 J	4.26	1.28	mg/Kg	1		10/13/15 17:09

Surrogates

4-Bromofluorobenzene (surr)	97.8	50-150		%	1		10/13/15 17:09
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Batch Information

Analytical Batch: VFC12743
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/13/15 17:09
 Container ID: 1158702014-B

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 13:50
 Prep Initial Wt./Vol.: 54.788 g
 Prep Extract Vol: 36.6928 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	10.6 J	21.3	6.81	ug/Kg	1		10/13/15 17:09
Ethylbenzene	31.9 J	42.6	13.3	ug/Kg	1		10/13/15 17:09
o-Xylene	56.2	42.6	13.3	ug/Kg	1		10/13/15 17:09
P & M -Xylene	118	85.1	25.5	ug/Kg	1		10/13/15 17:09
Toluene	65.6	42.6	13.3	ug/Kg	1		10/13/15 17:09

Surrogates

1,4-Difluorobenzene (surr)	97.2	72-119		%	1		10/13/15 17:09
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Batch Information

Analytical Batch: VFC12743
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/13/15 17:09
 Container ID: 1158702014-B

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 13:50
 Prep Initial Wt./Vol.: 54.788 g
 Prep Extract Vol: 36.6928 mL

Results of 15-RBY-SB-14-4

Client Sample ID: **15-RBY-SB-14-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702015
 Lab Project ID: 1158702

Collection Date: 09/29/15 14:14
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.6
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	27.5	24.5	7.58	mg/Kg	1		10/09/15 02:24
Surrogates							
5a Androstane (surr)	96.1	50-150		%	1		10/09/15 02:24

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 02:24
 Container ID: 1158702015-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.071 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-SB-14-4

Client Sample ID: **15-RBY-SB-14-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702015
 Lab Project ID: 1158702

Collection Date: 09/29/15 14:14
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.6
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	2.90 J	4.97	1.49	mg/Kg	1		10/13/15 16:50

Surrogates

4-Bromofluorobenzene (surr)	91.8	50-150		%	1		10/13/15 16:50
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Batch Information

Analytical Batch: VFC12743
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/13/15 16:50
 Container ID: 1158702015-B

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 14:14
 Prep Initial Wt./Vol.: 39.869 g
 Prep Extract Vol: 32.3395 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	12.4 U	24.9	7.95	ug/Kg	1		10/13/15 16:50
Ethylbenzene	24.9 U	49.7	15.5	ug/Kg	1		10/13/15 16:50
o-Xylene	24.9 U	49.7	15.5	ug/Kg	1		10/13/15 16:50
P & M -Xylene	49.7 U	99.4	29.8	ug/Kg	1		10/13/15 16:50
Toluene	24.9 U	49.7	15.5	ug/Kg	1		10/13/15 16:50

Surrogates

1,4-Difluorobenzene (surr)	97.8	72-119		%	1		10/13/15 16:50
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Batch Information

Analytical Batch: VFC12743
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/13/15 16:50
 Container ID: 1158702015-B

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 14:14
 Prep Initial Wt./Vol.: 39.869 g
 Prep Extract Vol: 32.3395 mL

Results of 15-RBY-SB-16-4

Client Sample ID: **15-RBY-SB-16-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702016
 Lab Project ID: 1158702

Collection Date: 09/29/15 14:35
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):80.1
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12200		1240	386	mg/Kg	10		10/09/15 13:54
Surrogates								
5a Androstane (surr)	0	*	50-150		%	10		10/09/15 13:54

Batch Information

Analytical Batch: XFC12147
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 13:54
 Container ID: 1158702016-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.106 g
 Prep Extract Vol: 5 mL

Results of 15-RBY-SB-16-4

Client Sample ID: **15-RBY-SB-16-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702016
 Lab Project ID: 1158702

Collection Date: 09/29/15 14:35
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):80.1
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	363	63.5	19.1	mg/Kg	10		10/13/15 16:11

Surrogates

4-Bromofluorobenzene (surr)	1490 *	50-150		%	10		10/13/15 16:11
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Batch Information

Analytical Batch: VFC12743
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/13/15 16:11
 Container ID: 1158702016-B

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 14:35
 Prep Initial Wt./Vol.: 30.537 g
 Prep Extract Vol: 31.0732 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	21.0 J	31.8	10.2	ug/Kg	1		10/13/15 19:22
Ethylbenzene	695	63.5	19.8	ug/Kg	1		10/13/15 19:22
o-Xylene	13600	63.5	19.8	ug/Kg	1		10/13/15 19:22
P & M -Xylene	2640	127	38.1	ug/Kg	1		10/13/15 19:22
Toluene	128	63.5	19.8	ug/Kg	1		10/13/15 19:22

Surrogates

1,4-Difluorobenzene (surr)	92.6	72-119		%	1		10/13/15 19:22
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Batch Information

Analytical Batch: VFC12743
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/13/15 19:22
 Container ID: 1158702016-B

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 14:35
 Prep Initial Wt./Vol.: 30.537 g
 Prep Extract Vol: 31.0732 mL

Results of 15-RBY-SD-16-4

Client Sample ID: **15-RBY-SD-16-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702017
 Lab Project ID: 1158702

Collection Date: 09/29/15 14:45
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):80.1
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	14500		497	154	mg/Kg	4		10/08/15 23:05
Surrogates								
5a Androstane (surr)	0	*	50-150		%	4		10/08/15 23:05

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/08/15 23:05
 Container ID: 1158702017-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.138 g
 Prep Extract Vol: 5 mL

Results of 15-RBY-SD-16-4

Client Sample ID: **15-RBY-SD-16-4**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702017
 Lab Project ID: 1158702

Collection Date: 09/29/15 14:45
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):80.1
 Location:

Results by Volatile Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	378	54.2	16.2	mg/Kg	10		10/13/15 16:31

Surrogates

4-Bromofluorobenzene (surr)	1910 *	50-150		%	10		10/13/15 16:31
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Batch Information

Analytical Batch: VFC12743
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/13/15 16:31
 Container ID: 1158702017-B

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 14:45
 Prep Initial Wt./Vol.: 37.416 g
 Prep Extract Vol: 32.4549 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	8.67 J	27.1	8.67	ug/Kg	1		10/13/15 19:40
Ethylbenzene	460	54.2	16.9	ug/Kg	1		10/13/15 19:40
o-Xylene	11300	542	169	ug/Kg	10		10/13/15 16:31
P & M -Xylene	2060	1080	325	ug/Kg	10		10/13/15 16:31
Toluene	51.5 J	54.2	16.9	ug/Kg	1		10/13/15 19:40

Surrogates

1,4-Difluorobenzene (surr)	99	72-119		%	1		10/13/15 19:40
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Batch Information

Analytical Batch: VFC12743
 Analytical Method: SW8021B
 Analyst: CRD
 Analytical Date/Time: 10/13/15 19:40
 Container ID: 1158702017-B

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 14:45
 Prep Initial Wt./Vol.: 37.416 g
 Prep Extract Vol: 32.4549 mL

Results of 15-RBY-CS-18-1

Client Sample ID: **15-RBY-CS-18-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702018
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:50
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):79.4
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	13.1 J	24.8	7.68	mg/Kg	1		10/09/15 02:54
Surrogates							
5a Androstane (surr)	91.8	50-150		%	1		10/09/15 02:54

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 02:54
 Container ID: 1158702018-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.495 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-CS-18-1

Client Sample ID: **15-RBY-CS-18-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702018
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:50
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):79.4
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	6.37	4.59	1.38	mg/Kg	1		10/13/15 12:58
Surrogates							
4-Bromofluorobenzene (surr)	95.9	50-150		%	1		10/13/15 12:58

Batch Information

Analytical Batch: VFC12744
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/13/15 12:58
 Container ID: 1158702018-B

Prep Batch: VXX28070
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 20:50
 Prep Initial Wt./Vol.: 47.881 g
 Prep Extract Vol: 34.8629 mL

Results of 15-RBY-CS-18-1

Client Sample ID: **15-RBY-CS-18-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702018
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:50
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%): 79.4
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
1,1,1-Trichloroethane	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
1,1,2,2-Tetrachloroethane	11.4 U	22.9	7.15	ug/Kg	1		10/12/15 18:56
1,1,2-Trichloroethane	9.15 U	18.3	5.69	ug/Kg	1		10/12/15 18:56
1,1-Dichloroethane	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
1,1-Dichloroethene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
1,1-Dichloropropene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
1,2,3-Trichlorobenzene	45.9 U	91.7	27.5	ug/Kg	1		10/12/15 18:56
1,2,3-Trichloropropane	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
1,2,4-Trichlorobenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
1,2,4-Trimethylbenzene	45.9 U	91.7	27.5	ug/Kg	1		10/12/15 18:56
1,2-Dibromo-3-chloropropane	91.5 U	183	56.9	ug/Kg	1		10/12/15 18:56
1,2-Dibromoethane	9.15 U	18.3	5.69	ug/Kg	1		10/12/15 18:56
1,2-Dichlorobenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
1,2-Dichloroethane	9.15 U	18.3	5.69	ug/Kg	1		10/12/15 18:56
1,2-Dichloropropane	9.15 U	18.3	5.69	ug/Kg	1		10/12/15 18:56
1,3,5-Trimethylbenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
1,3-Dichlorobenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
1,3-Dichloropropane	9.15 U	18.3	5.69	ug/Kg	1		10/12/15 18:56
1,4-Dichlorobenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
2,2-Dichloropropane	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
2-Butanone (MEK)	230 U	459	143	ug/Kg	1		10/12/15 18:56
2-Chlorotoluene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
2-Hexanone	230 U	459	143	ug/Kg	1		10/12/15 18:56
4-Chlorotoluene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
4-Isopropyltoluene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
4-Methyl-2-pentanone (MIBK)	230 U	459	143	ug/Kg	1		10/12/15 18:56
Benzene	11.4 U	22.9	7.15	ug/Kg	1		10/12/15 18:56
Bromobenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Bromochloromethane	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Bromodichloromethane	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Bromoform	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Bromomethane	184 U	367	114	ug/Kg	1		10/12/15 18:56
Carbon disulfide	91.5 U	183	56.9	ug/Kg	1		10/12/15 18:56
Carbon tetrachloride	11.4 U	22.9	7.15	ug/Kg	1		10/12/15 18:56
Chlorobenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Chloroethane	184 U	367	114	ug/Kg	1		10/12/15 18:56

Print Date: 10/27/2015 2:44:05PM

J flagging is activated

Results of 15-RBY-CS-18-1

Client Sample ID: **15-RBY-CS-18-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702018
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:50
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%): 79.4
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Chloromethane	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
cis-1,2-Dichloroethene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
cis-1,3-Dichloropropene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Dibromochloromethane	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Dibromomethane	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Dichlorodifluoromethane	45.9 U	91.7	27.5	ug/Kg	1		10/12/15 18:56
Ethylbenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Freon-113	91.5 U	183	56.9	ug/Kg	1		10/12/15 18:56
Hexachlorobutadiene	45.9 U	91.7	27.5	ug/Kg	1		10/12/15 18:56
Isopropylbenzene (Cumene)	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Methylene chloride	91.5 U	183	56.9	ug/Kg	1		10/12/15 18:56
Methyl-t-butyl ether	91.5 U	183	56.9	ug/Kg	1		10/12/15 18:56
Naphthalene	45.9 U	91.7	27.5	ug/Kg	1		10/12/15 18:56
n-Butylbenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
n-Propylbenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
o-Xylene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
P & M -Xylene	45.9 U	91.7	27.5	ug/Kg	1		10/12/15 18:56
sec-Butylbenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Styrene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
tert-Butylbenzene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Tetrachloroethene	11.4 U	22.9	7.15	ug/Kg	1		10/12/15 18:56
Toluene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
trans-1,2-Dichloroethene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
trans-1,3-Dichloropropene	22.9 U	45.9	14.3	ug/Kg	1		10/12/15 18:56
Trichloroethene	11.4 U	22.9	7.15	ug/Kg	1		10/12/15 18:56
Trichlorofluoromethane	45.9 U	91.7	27.5	ug/Kg	1		10/12/15 18:56
Vinyl acetate	91.5 U	183	56.9	ug/Kg	1		10/12/15 18:56
Vinyl chloride	9.15 U	18.3	5.69	ug/Kg	1		10/12/15 18:56
Xylenes (total)	69.0 U	138	41.8	ug/Kg	1		10/12/15 18:56
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	71-136		%	1		10/12/15 18:56
4-Bromofluorobenzene (surr)	101	55-151		%	1		10/12/15 18:56
Toluene-d8 (surr)	113	85-116		%	1		10/12/15 18:56

Print Date: 10/27/2015 2:44:05PM

J flagging is activated

Results of 15-RBY-CS-18-1

Client Sample ID: **15-RBY-CS-18-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702018
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:50
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):79.4
 Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS15331
 Analytical Method: SW8260B
 Analyst: ST
 Analytical Date/Time: 10/12/15 18:56
 Container ID:

Prep Batch: VXX28064
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 20:50
 Prep Initial Wt./Vol.: 47.881 g
 Prep Extract Vol: 34.8629 mL

Results of 15-RBY-CS-19-1

Client Sample ID: **15-RBY-CS-19-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702019
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:52
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%): 76.9
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	32.8	26.0	8.05	mg/Kg	1		10/09/15 02:44
Surrogates							
5a Androstane (surr)	79.9	50-150		%	1		10/09/15 02:44

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 02:44
 Container ID: 1158702019-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.069 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-CS-19-1

Client Sample ID: **15-RBY-CS-19-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702019
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:52
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%): 76.9
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	2.55 J	4.75	1.42	mg/Kg	1		10/13/15 13:17
Surrogates							
4-Bromofluorobenzene (surr)	90.6	50-150		%	1		10/13/15 13:17

Batch Information

Analytical Batch: VFC12744
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/13/15 13:17
 Container ID: 1158702019-B

Prep Batch: VXX28070
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 20:52
 Prep Initial Wt./Vol.: 50.161 g
 Prep Extract Vol: 36.6083 mL

Results of 15-RBY-CS-19-1

Client Sample ID: **15-RBY-CS-19-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702019
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:52
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%): 76.9
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
1,1,1-Trichloroethane	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
1,1,2,2-Tetrachloroethane	11.9 U	23.7	7.41	ug/Kg	1		10/09/15 23:43
1,1,2-Trichloroethane	9.50 U	19.0	5.89	ug/Kg	1		10/09/15 23:43
1,1-Dichloroethane	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
1,1-Dichloroethene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
1,1-Dichloropropene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
1,2,3-Trichlorobenzene	47.5 U	95.0	28.5	ug/Kg	1		10/09/15 23:43
1,2,3-Trichloropropane	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
1,2,4-Trichlorobenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
1,2,4-Trimethylbenzene	47.5 U	95.0	28.5	ug/Kg	1		10/09/15 23:43
1,2-Dibromo-3-chloropropane	95.0 U	190	58.9	ug/Kg	1		10/09/15 23:43
1,2-Dibromoethane	9.50 U	19.0	5.89	ug/Kg	1		10/09/15 23:43
1,2-Dichlorobenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
1,2-Dichloroethane	9.50 U	19.0	5.89	ug/Kg	1		10/09/15 23:43
1,2-Dichloropropane	9.50 U	19.0	5.89	ug/Kg	1		10/09/15 23:43
1,3,5-Trimethylbenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
1,3-Dichlorobenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
1,3-Dichloropropane	9.50 U	19.0	5.89	ug/Kg	1		10/09/15 23:43
1,4-Dichlorobenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
2,2-Dichloropropane	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
2-Butanone (MEK)	238 U	475	148	ug/Kg	1		10/09/15 23:43
2-Chlorotoluene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
2-Hexanone	238 U	475	148	ug/Kg	1		10/09/15 23:43
4-Chlorotoluene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
4-Isopropyltoluene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
4-Methyl-2-pentanone (MIBK)	238 U	475	148	ug/Kg	1		10/09/15 23:43
Benzene	11.9 U	23.7	7.41	ug/Kg	1		10/09/15 23:43
Bromobenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Bromochloromethane	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Bromodichloromethane	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Bromoform	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Bromomethane	190 U	380	118	ug/Kg	1		10/09/15 23:43
Carbon disulfide	95.0 U	190	58.9	ug/Kg	1		10/09/15 23:43
Carbon tetrachloride	11.9 U	23.7	7.41	ug/Kg	1		10/09/15 23:43
Chlorobenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Chloroethane	190 U	380	118	ug/Kg	1		10/09/15 23:43

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J flagging is activated

Results of 15-RBY-CS-19-1

Client Sample ID: **15-RBY-CS-19-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702019
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:52
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%): 76.9
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Chloromethane	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
cis-1,2-Dichloroethene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
cis-1,3-Dichloropropene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Dibromochloromethane	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Dibromomethane	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Dichlorodifluoromethane	47.5 U	95.0	28.5	ug/Kg	1		10/09/15 23:43
Ethylbenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Freon-113	95.0 U	190	58.9	ug/Kg	1		10/09/15 23:43
Hexachlorobutadiene	47.5 U	95.0	28.5	ug/Kg	1		10/09/15 23:43
Isopropylbenzene (Cumene)	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Methylene chloride	95.0 U	190	58.9	ug/Kg	1		10/09/15 23:43
Methyl-t-butyl ether	95.0 U	190	58.9	ug/Kg	1		10/09/15 23:43
Naphthalene	47.5 U	95.0	28.5	ug/Kg	1		10/09/15 23:43
n-Butylbenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
n-Propylbenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
o-Xylene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
P & M -Xylene	47.5 U	95.0	28.5	ug/Kg	1		10/09/15 23:43
sec-Butylbenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Styrene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
tert-Butylbenzene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Tetrachloroethene	11.9 U	23.7	7.41	ug/Kg	1		10/09/15 23:43
Toluene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
trans-1,2-Dichloroethene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
trans-1,3-Dichloropropene	23.8 U	47.5	14.8	ug/Kg	1		10/09/15 23:43
Trichloroethene	11.9 U	23.7	7.41	ug/Kg	1		10/09/15 23:43
Trichlorofluoromethane	47.5 U	95.0	28.5	ug/Kg	1		10/09/15 23:43
Vinyl acetate	95.0 U	190	58.9	ug/Kg	1		10/09/15 23:43
Vinyl chloride	9.50 U	19.0	5.89	ug/Kg	1		10/09/15 23:43
Xylenes (total)	71.0 U	142	43.3	ug/Kg	1		10/09/15 23:43
Surrogates							
1,2-Dichloroethane-D4 (surr)	115	71-136		%	1		10/09/15 23:43
4-Bromofluorobenzene (surr)	105	55-151		%	1		10/09/15 23:43
Toluene-d8 (surr)	107	85-116		%	1		10/09/15 23:43

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J flagging is activated

Results of 15-RBY-CS-19-1

Client Sample ID: **15-RBY-CS-19-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702019
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:52
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):76.9
 Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS15327
 Analytical Method: SW8260B
 Analyst: ST
 Analytical Date/Time: 10/09/15 23:43
 Container ID: 1158702019-B

Prep Batch: VXX28043
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 20:52
 Prep Initial Wt./Vol.: 50.161 g
 Prep Extract Vol: 36.6083 mL

Results of 15-RBY-CS-21-1

Client Sample ID: **15-RBY-CS-21-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702020
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:54
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):77.2
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	56.2	25.6	7.94	mg/Kg	1		10/09/15 03:04
Surrogates							
5a Androstane (surr)	85.6	50-150		%	1		10/09/15 03:04

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/09/15 03:04
 Container ID: 1158702020-A

Prep Batch: XXX34353
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 21:29
 Prep Initial Wt./Vol.: 30.348 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-CS-21-1

Client Sample ID: **15-RBY-CS-21-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702020
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:54
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):77.2
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.71 J	4.50	1.35	mg/Kg	1		10/13/15 13:36
Surrogates							
4-Bromofluorobenzene (surr)	87.7	50-150		%	1		10/13/15 13:36

Batch Information

Analytical Batch: VFC12744
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/13/15 13:36
 Container ID: 1158702020-B

Prep Batch: VXX28070
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 20:54
 Prep Initial Wt./Vol.: 53.434 g
 Prep Extract Vol: 37.1746 mL

Results of 15-RBY-CS-21-1

Client Sample ID: **15-RBY-CS-21-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702020
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:54
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):77.2
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
1,1,1-Trichloroethane	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
1,1,2,2-Tetrachloroethane	11.3 U	22.5	7.03	ug/Kg	1		10/09/15 23:27
1,1,2-Trichloroethane	9.00 U	18.0	5.59	ug/Kg	1		10/09/15 23:27
1,1-Dichloroethane	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
1,1-Dichloroethene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
1,1-Dichloropropene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
1,2,3-Trichlorobenzene	45.0 U	90.1	27.0	ug/Kg	1		10/09/15 23:27
1,2,3-Trichloropropane	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
1,2,4-Trichlorobenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
1,2,4-Trimethylbenzene	45.0 U	90.1	27.0	ug/Kg	1		10/09/15 23:27
1,2-Dibromo-3-chloropropane	90.0 U	180	55.9	ug/Kg	1		10/09/15 23:27
1,2-Dibromoethane	9.00 U	18.0	5.59	ug/Kg	1		10/09/15 23:27
1,2-Dichlorobenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
1,2-Dichloroethane	9.00 U	18.0	5.59	ug/Kg	1		10/09/15 23:27
1,2-Dichloropropane	9.00 U	18.0	5.59	ug/Kg	1		10/09/15 23:27
1,3,5-Trimethylbenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
1,3-Dichlorobenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
1,3-Dichloropropane	9.00 U	18.0	5.59	ug/Kg	1		10/09/15 23:27
1,4-Dichlorobenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
2,2-Dichloropropane	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
2-Butanone (MEK)	225 U	450	141	ug/Kg	1		10/09/15 23:27
2-Chlorotoluene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
2-Hexanone	225 U	450	141	ug/Kg	1		10/09/15 23:27
4-Chlorotoluene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
4-Isopropyltoluene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
4-Methyl-2-pentanone (MIBK)	225 U	450	141	ug/Kg	1		10/09/15 23:27
Benzene	11.3 U	22.5	7.03	ug/Kg	1		10/09/15 23:27
Bromobenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Bromochloromethane	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Bromodichloromethane	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Bromoform	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Bromomethane	180 U	360	112	ug/Kg	1		10/09/15 23:27
Carbon disulfide	90.0 U	180	55.9	ug/Kg	1		10/09/15 23:27
Carbon tetrachloride	11.3 U	22.5	7.03	ug/Kg	1		10/09/15 23:27
Chlorobenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Chloroethane	180 U	360	112	ug/Kg	1		10/09/15 23:27

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Results of 15-RBY-CS-21-1

Client Sample ID: **15-RBY-CS-21-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702020
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:54
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%): 77.2
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Chloromethane	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
cis-1,2-Dichloroethene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
cis-1,3-Dichloropropene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Dibromochloromethane	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Dibromomethane	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Dichlorodifluoromethane	45.0 U	90.1	27.0	ug/Kg	1		10/09/15 23:27
Ethylbenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Freon-113	90.0 U	180	55.9	ug/Kg	1		10/09/15 23:27
Hexachlorobutadiene	45.0 U	90.1	27.0	ug/Kg	1		10/09/15 23:27
Isopropylbenzene (Cumene)	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Methylene chloride	90.0 U	180	55.9	ug/Kg	1		10/09/15 23:27
Methyl-t-butyl ether	90.0 U	180	55.9	ug/Kg	1		10/09/15 23:27
Naphthalene	45.0 U	90.1	27.0	ug/Kg	1		10/09/15 23:27
n-Butylbenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
n-Propylbenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
o-Xylene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
P & M -Xylene	45.0 U	90.1	27.0	ug/Kg	1		10/09/15 23:27
sec-Butylbenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Styrene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
tert-Butylbenzene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Tetrachloroethene	11.3 U	22.5	7.03	ug/Kg	1		10/09/15 23:27
Toluene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
trans-1,2-Dichloroethene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
trans-1,3-Dichloropropene	22.5 U	45.0	14.1	ug/Kg	1		10/09/15 23:27
Trichloroethene	11.3 U	22.5	7.03	ug/Kg	1		10/09/15 23:27
Trichlorofluoromethane	45.0 U	90.1	27.0	ug/Kg	1		10/09/15 23:27
Vinyl acetate	90.0 U	180	55.9	ug/Kg	1		10/09/15 23:27
Vinyl chloride	9.00 U	18.0	5.59	ug/Kg	1		10/09/15 23:27
Xylenes (total)	67.5 U	135	41.1	ug/Kg	1		10/09/15 23:27
Surrogates							
1,2-Dichloroethane-D4 (surr)	120	71-136		%	1		10/09/15 23:27
4-Bromofluorobenzene (surr)	101	55-151		%	1		10/09/15 23:27
Toluene-d8 (surr)	111	85-116		%	1		10/09/15 23:27

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Results of 15-RBY-CS-21-1

Client Sample ID: **15-RBY-CS-21-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702020
 Lab Project ID: 1158702

Collection Date: 09/29/15 20:54
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):77.2
 Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS15327
 Analytical Method: SW8260B
 Analyst: ST
 Analytical Date/Time: 10/09/15 23:27
 Container ID: 1158702020-B

Prep Batch: VXX28043
 Prep Method: SW5035A
 Prep Date/Time: 09/29/15 20:54
 Prep Initial Wt./Vol.: 53.434 g
 Prep Extract Vol: 37.1746 mL

Results of 15-RBY-CS-24-1

Client Sample ID: **15-RBY-CS-24-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702021
 Lab Project ID: 1158702

Collection Date: 09/30/15 08:40
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):78.1
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	15.6 J	25.3	7.83	mg/Kg	1		10/08/15 11:10
Surrogates							
5a Androstane (surr)	78.1	50-150		%	1		10/08/15 11:10

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/08/15 11:10
 Container ID: 1158702021-A

Prep Batch: XXX34352
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 17:40
 Prep Initial Wt./Vol.: 30.389 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-CS-24-1

Client Sample ID: **15-RBY-CS-24-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702021
 Lab Project ID: 1158702

Collection Date: 09/30/15 08:40
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):78.1
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.21 J	3.55	1.07	mg/Kg	1		10/13/15 13:55
Surrogates							
4-Bromofluorobenzene (surr)	92.2	50-150		%	1		10/13/15 13:55

Batch Information

Analytical Batch: VFC12744
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/13/15 13:55
 Container ID: 1158702021-B

Prep Batch: VXX28070
 Prep Method: SW5035A
 Prep Date/Time: 09/30/15 08:40
 Prep Initial Wt./Vol.: 74.224 g
 Prep Extract Vol: 41.2181 mL

Results of 15-RBY-CS-24-1

Client Sample ID: **15-RBY-CS-24-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702021
 Lab Project ID: 1158702

Collection Date: 09/30/15 08:40
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):78.1
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
1,1,1-Trichloroethane	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
1,1,2,2-Tetrachloroethane	8.90 U	17.8	5.54	ug/Kg	1		10/09/15 23:11
1,1,2-Trichloroethane	7.10 U	14.2	4.41	ug/Kg	1		10/09/15 23:11
1,1-Dichloroethane	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
1,1-Dichloroethene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
1,1-Dichloropropene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
1,2,3-Trichlorobenzene	35.5 U	71.1	21.3	ug/Kg	1		10/09/15 23:11
1,2,3-Trichloropropane	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
1,2,4-Trichlorobenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
1,2,4-Trimethylbenzene	35.5 U	71.1	21.3	ug/Kg	1		10/09/15 23:11
1,2-Dibromo-3-chloropropane	71.0 U	142	44.1	ug/Kg	1		10/09/15 23:11
1,2-Dibromoethane	7.10 U	14.2	4.41	ug/Kg	1		10/09/15 23:11
1,2-Dichlorobenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
1,2-Dichloroethane	7.10 U	14.2	4.41	ug/Kg	1		10/09/15 23:11
1,2-Dichloropropane	7.10 U	14.2	4.41	ug/Kg	1		10/09/15 23:11
1,3,5-Trimethylbenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
1,3-Dichlorobenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
1,3-Dichloropropane	7.10 U	14.2	4.41	ug/Kg	1		10/09/15 23:11
1,4-Dichlorobenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
2,2-Dichloropropane	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
2-Butanone (MEK)	178 U	355	111	ug/Kg	1		10/09/15 23:11
2-Chlorotoluene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
2-Hexanone	178 U	355	111	ug/Kg	1		10/09/15 23:11
4-Chlorotoluene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
4-Isopropyltoluene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
4-Methyl-2-pentanone (MIBK)	178 U	355	111	ug/Kg	1		10/09/15 23:11
Benzene	8.90 U	17.8	5.54	ug/Kg	1		10/09/15 23:11
Bromobenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Bromochloromethane	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Bromodichloromethane	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Bromoform	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Bromomethane	142 U	284	88.1	ug/Kg	1		10/09/15 23:11
Carbon disulfide	71.0 U	142	44.1	ug/Kg	1		10/09/15 23:11
Carbon tetrachloride	8.90 U	17.8	5.54	ug/Kg	1		10/09/15 23:11
Chlorobenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Chloroethane	142 U	284	88.1	ug/Kg	1		10/09/15 23:11

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J flagging is activated

Results of 15-RBY-CS-24-1

Client Sample ID: **15-RBY-CS-24-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702021
 Lab Project ID: 1158702

Collection Date: 09/30/15 08:40
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%): 78.1
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Chloromethane	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
cis-1,2-Dichloroethene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
cis-1,3-Dichloropropene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Dibromochloromethane	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Dibromomethane	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Dichlorodifluoromethane	35.5 U	71.1	21.3	ug/Kg	1		10/09/15 23:11
Ethylbenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Freon-113	71.0 U	142	44.1	ug/Kg	1		10/09/15 23:11
Hexachlorobutadiene	35.5 U	71.1	21.3	ug/Kg	1		10/09/15 23:11
Isopropylbenzene (Cumene)	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Methylene chloride	71.0 U	142	44.1	ug/Kg	1		10/09/15 23:11
Methyl-t-butyl ether	71.0 U	142	44.1	ug/Kg	1		10/09/15 23:11
Naphthalene	35.5 U	71.1	21.3	ug/Kg	1		10/09/15 23:11
n-Butylbenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
n-Propylbenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
o-Xylene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
P & M -Xylene	35.5 U	71.1	21.3	ug/Kg	1		10/09/15 23:11
sec-Butylbenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Styrene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
tert-Butylbenzene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Tetrachloroethene	8.90 U	17.8	5.54	ug/Kg	1		10/09/15 23:11
Toluene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
trans-1,2-Dichloroethene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
trans-1,3-Dichloropropene	17.8 U	35.5	11.1	ug/Kg	1		10/09/15 23:11
Trichloroethene	8.90 U	17.8	5.54	ug/Kg	1		10/09/15 23:11
Trichlorofluoromethane	35.5 U	71.1	21.3	ug/Kg	1		10/09/15 23:11
Vinyl acetate	71.0 U	142	44.1	ug/Kg	1		10/09/15 23:11
Vinyl chloride	7.10 U	14.2	4.41	ug/Kg	1		10/09/15 23:11
Xylenes (total)	53.5 U	107	32.4	ug/Kg	1		10/09/15 23:11
Surrogates							
1,2-Dichloroethane-D4 (surr)	118	71-136		%	1		10/09/15 23:11
4-Bromofluorobenzene (surr)	110	55-151		%	1		10/09/15 23:11
Toluene-d8 (surr)	111	85-116		%	1		10/09/15 23:11

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J flagging is activated

Results of 15-RBY-CS-24-1

Client Sample ID: **15-RBY-CS-24-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702021
 Lab Project ID: 1158702

Collection Date: 09/30/15 08:40
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):78.1
 Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS15327
 Analytical Method: SW8260B
 Analyst: ST
 Analytical Date/Time: 10/09/15 23:11
 Container ID: 1158702021-B

Prep Batch: VXX28043
 Prep Method: SW5035A
 Prep Date/Time: 09/30/15 08:40
 Prep Initial Wt./Vol.: 74.224 g
 Prep Extract Vol: 41.2181 mL

Results of 15-RBY-CS-26-1

Client Sample ID: **15-RBY-CS-26-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702022
 Lab Project ID: 1158702

Collection Date: 09/30/15 08:45
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.8
 Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12.2 U	24.3	7.52	mg/Kg	1		10/08/15 11:20
Surrogates							
5a Androstane (surr)	77	50-150		%	1		10/08/15 11:20

Batch Information

Analytical Batch: XFC12141
 Analytical Method: AK102
 Analyst: NLL
 Analytical Date/Time: 10/08/15 11:20
 Container ID: 1158702022-A

Prep Batch: XXX34352
 Prep Method: SW3550C
 Prep Date/Time: 10/07/15 17:40
 Prep Initial Wt./Vol.: 30.214 g
 Prep Extract Vol: 1 mL

Results of 15-RBY-CS-26-1

Client Sample ID: **15-RBY-CS-26-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702022
 Lab Project ID: 1158702

Collection Date: 09/30/15 08:45
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.8
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.75 U	3.49	1.05	mg/Kg	1		10/13/15 14:14
Surrogates							
4-Bromofluorobenzene (surr)	99.9	50-150		%	1		10/13/15 14:14

Batch Information

Analytical Batch: VFC12744
 Analytical Method: AK101
 Analyst: CRD
 Analytical Date/Time: 10/13/15 14:14
 Container ID: 1158702022-B

Prep Batch: VXX28070
 Prep Method: SW5035A
 Prep Date/Time: 09/30/15 08:45
 Prep Initial Wt./Vol.: 64.266 g
 Prep Extract Vol: 36.6804 mL

Results of 15-RBY-CS-26-1

Client Sample ID: **15-RBY-CS-26-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702022
 Lab Project ID: 1158702

Collection Date: 09/30/15 08:45
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.8
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
1,1,1-Trichloroethane	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
1,1,2,2-Tetrachloroethane	8.70 U	17.4	5.44	ug/Kg	1		10/09/15 22:55
1,1,2-Trichloroethane	7.00 U	14.0	4.32	ug/Kg	1		10/09/15 22:55
1,1-Dichloroethane	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
1,1-Dichloroethene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
1,1-Dichloropropene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
1,2,3-Trichlorobenzene	34.9 U	69.8	20.9	ug/Kg	1		10/09/15 22:55
1,2,3-Trichloropropane	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
1,2,4-Trichlorobenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
1,2,4-Trimethylbenzene	34.9 U	69.8	20.9	ug/Kg	1		10/09/15 22:55
1,2-Dibromo-3-chloropropane	70.0 U	140	43.2	ug/Kg	1		10/09/15 22:55
1,2-Dibromoethane	7.00 U	14.0	4.32	ug/Kg	1		10/09/15 22:55
1,2-Dichlorobenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
1,2-Dichloroethane	7.00 U	14.0	4.32	ug/Kg	1		10/09/15 22:55
1,2-Dichloropropane	7.00 U	14.0	4.32	ug/Kg	1		10/09/15 22:55
1,3,5-Trimethylbenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
1,3-Dichlorobenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
1,3-Dichloropropane	7.00 U	14.0	4.32	ug/Kg	1		10/09/15 22:55
1,4-Dichlorobenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
2,2-Dichloropropane	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
2-Butanone (MEK)	175 U	349	109	ug/Kg	1		10/09/15 22:55
2-Chlorotoluene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
2-Hexanone	175 U	349	109	ug/Kg	1		10/09/15 22:55
4-Chlorotoluene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
4-Isopropyltoluene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
4-Methyl-2-pentanone (MIBK)	175 U	349	109	ug/Kg	1		10/09/15 22:55
Benzene	8.70 U	17.4	5.44	ug/Kg	1		10/09/15 22:55
Bromobenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Bromochloromethane	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Bromodichloromethane	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Bromoform	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Bromomethane	140 U	279	86.5	ug/Kg	1		10/09/15 22:55
Carbon disulfide	70.0 U	140	43.2	ug/Kg	1		10/09/15 22:55
Carbon tetrachloride	8.70 U	17.4	5.44	ug/Kg	1		10/09/15 22:55
Chlorobenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Chloroethane	140 U	279	86.5	ug/Kg	1		10/09/15 22:55

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Results of 15-RBY-CS-26-1

Client Sample ID: **15-RBY-CS-26-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702022
 Lab Project ID: 1158702

Collection Date: 09/30/15 08:45
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.8
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Chloromethane	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
cis-1,2-Dichloroethene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
cis-1,3-Dichloropropene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Dibromochloromethane	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Dibromomethane	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Dichlorodifluoromethane	34.9 U	69.8	20.9	ug/Kg	1		10/09/15 22:55
Ethylbenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Freon-113	70.0 U	140	43.2	ug/Kg	1		10/09/15 22:55
Hexachlorobutadiene	34.9 U	69.8	20.9	ug/Kg	1		10/09/15 22:55
Isopropylbenzene (Cumene)	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Methylene chloride	70.0 U	140	43.2	ug/Kg	1		10/09/15 22:55
Methyl-t-butyl ether	70.0 U	140	43.2	ug/Kg	1		10/09/15 22:55
Naphthalene	34.9 U	69.8	20.9	ug/Kg	1		10/09/15 22:55
n-Butylbenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
n-Propylbenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
o-Xylene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
P & M -Xylene	34.9 U	69.8	20.9	ug/Kg	1		10/09/15 22:55
sec-Butylbenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Styrene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
tert-Butylbenzene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Tetrachloroethene	8.70 U	17.4	5.44	ug/Kg	1		10/09/15 22:55
Toluene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
trans-1,2-Dichloroethene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
trans-1,3-Dichloropropene	17.4 U	34.9	10.9	ug/Kg	1		10/09/15 22:55
Trichloroethene	8.70 U	17.4	5.44	ug/Kg	1		10/09/15 22:55
Trichlorofluoromethane	34.9 U	69.8	20.9	ug/Kg	1		10/09/15 22:55
Vinyl acetate	70.0 U	140	43.2	ug/Kg	1		10/09/15 22:55
Vinyl chloride	7.00 U	14.0	4.32	ug/Kg	1		10/09/15 22:55
Xylenes (total)	52.5 U	105	31.8	ug/Kg	1		10/09/15 22:55
Surrogates							
1,2-Dichloroethane-D4 (surr)	114	71-136		%	1		10/09/15 22:55
4-Bromofluorobenzene (surr)	110	55-151		%	1		10/09/15 22:55
Toluene-d8 (surr)	105	85-116		%	1		10/09/15 22:55

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Results of 15-RBY-CS-26-1

Client Sample ID: **15-RBY-CS-26-1**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702022
 Lab Project ID: 1158702

Collection Date: 09/30/15 08:45
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):81.8
 Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS15327
 Analytical Method: SW8260B
 Analyst: ST
 Analytical Date/Time: 10/09/15 22:55
 Container ID: 1158702022-B

Prep Batch: VXX28043
 Prep Method: SW5035A
 Prep Date/Time: 09/30/15 08:45
 Prep Initial Wt./Vol.: 64.266 g
 Prep Extract Vol: 36.6804 mL

Results of Trip Blank A

Client Sample ID: **Trip Blank A**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702023
 Lab Project ID: 1158702

Collection Date: 09/28/15 14:10
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.59 J	2.46	0.737	mg/Kg	1		10/11/15 19:49

Surrogates

4-Bromofluorobenzene (surr)	90.2	50-150		%	1		10/11/15 19:49
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Batch Information

Analytical Batch: VFC12737
 Analytical Method: AK101
 Analyst: KAS
 Analytical Date/Time: 10/11/15 19:49
 Container ID: 1158702023-A

Prep Batch: VXX28062
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 14:10
 Prep Initial Wt./Vol.: 50.888 g
 Prep Extract Vol: 25 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	6.15 U	12.3	3.93	ug/Kg	1		10/11/15 19:49
Ethylbenzene	12.3 U	24.6	7.66	ug/Kg	1		10/11/15 19:49
o-Xylene	12.3 U	24.6	7.66	ug/Kg	1		10/11/15 19:49
P & M -Xylene	24.6 U	49.1	14.7	ug/Kg	1		10/11/15 19:49
Toluene	12.3 U	24.6	7.66	ug/Kg	1		10/11/15 19:49

Surrogates

1,4-Difluorobenzene (surr)	93.4	72-119		%	1		10/11/15 19:49
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Batch Information

Analytical Batch: VFC12737
 Analytical Method: SW8021B
 Analyst: KAS
 Analytical Date/Time: 10/11/15 19:49
 Container ID: 1158702023-A

Prep Batch: VXX28062
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 14:10
 Prep Initial Wt./Vol.: 50.888 g
 Prep Extract Vol: 25 mL

Results of Trip Blank B

Client Sample ID: **Trip Blank B**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702024
 Lab Project ID: 1158702

Collection Date: 09/28/15 14:10
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
1,1,1-Trichloroethane	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
1,1,2,2-Tetrachloroethane	6.15 U	12.3	3.85	ug/Kg	1		10/09/15 20:31
1,1,2-Trichloroethane	4.93 U	9.86	3.06	ug/Kg	1		10/09/15 20:31
1,1-Dichloroethane	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
1,1-Dichloroethene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
1,1-Dichloropropene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
1,2,3-Trichlorobenzene	24.6 U	49.3	14.8	ug/Kg	1		10/09/15 20:31
1,2,3-Trichloropropane	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
1,2,4-Trichlorobenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
1,2,4-Trimethylbenzene	24.6 U	49.3	14.8	ug/Kg	1		10/09/15 20:31
1,2-Dibromo-3-chloropropane	49.3 U	98.6	30.6	ug/Kg	1		10/09/15 20:31
1,2-Dibromoethane	4.93 U	9.86	3.06	ug/Kg	1		10/09/15 20:31
1,2-Dichlorobenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
1,2-Dichloroethane	4.93 U	9.86	3.06	ug/Kg	1		10/09/15 20:31
1,2-Dichloropropane	4.93 U	9.86	3.06	ug/Kg	1		10/09/15 20:31
1,3,5-Trimethylbenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
1,3-Dichlorobenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
1,3-Dichloropropane	4.93 U	9.86	3.06	ug/Kg	1		10/09/15 20:31
1,4-Dichlorobenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
2,2-Dichloropropane	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
2-Butanone (MEK)	124 U	247	76.9	ug/Kg	1		10/09/15 20:31
2-Chlorotoluene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
2-Hexanone	124 U	247	76.9	ug/Kg	1		10/09/15 20:31
4-Chlorotoluene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
4-Isopropyltoluene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
4-Methyl-2-pentanone (MIBK)	124 U	247	76.9	ug/Kg	1		10/09/15 20:31
Benzene	6.15 U	12.3	3.85	ug/Kg	1		10/09/15 20:31
Bromobenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Bromochloromethane	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Bromodichloromethane	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Bromoform	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Bromomethane	98.5 U	197	61.1	ug/Kg	1		10/09/15 20:31
Carbon disulfide	49.3 U	98.6	30.6	ug/Kg	1		10/09/15 20:31
Carbon tetrachloride	6.15 U	12.3	3.85	ug/Kg	1		10/09/15 20:31
Chlorobenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Chloroethane	98.5 U	197	61.1	ug/Kg	1		10/09/15 20:31

Print Date: 10/27/2015 2:44:05PM

J flagging is activated

Results of Trip Blank B

Client Sample ID: **Trip Blank B**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702024
 Lab Project ID: 1158702

Collection Date: 09/28/15 14:10
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Chloromethane	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
cis-1,2-Dichloroethene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
cis-1,3-Dichloropropene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Dibromochloromethane	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Dibromomethane	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Dichlorodifluoromethane	24.6 U	49.3	14.8	ug/Kg	1		10/09/15 20:31
Ethylbenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Freon-113	49.3 U	98.6	30.6	ug/Kg	1		10/09/15 20:31
Hexachlorobutadiene	24.6 U	49.3	14.8	ug/Kg	1		10/09/15 20:31
Isopropylbenzene (Cumene)	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Methylene chloride	49.3 U	98.6	30.6	ug/Kg	1		10/09/15 20:31
Methyl-t-butyl ether	49.3 U	98.6	30.6	ug/Kg	1		10/09/15 20:31
Naphthalene	24.6 U	49.3	14.8	ug/Kg	1		10/09/15 20:31
n-Butylbenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
n-Propylbenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
o-Xylene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
P & M -Xylene	24.6 U	49.3	14.8	ug/Kg	1		10/09/15 20:31
sec-Butylbenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Styrene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
tert-Butylbenzene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Tetrachloroethene	6.15 U	12.3	3.85	ug/Kg	1		10/09/15 20:31
Toluene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
trans-1,2-Dichloroethene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
trans-1,3-Dichloropropene	12.4 U	24.7	7.69	ug/Kg	1		10/09/15 20:31
Trichloroethene	6.15 U	12.3	3.85	ug/Kg	1		10/09/15 20:31
Trichlorofluoromethane	24.6 U	49.3	14.8	ug/Kg	1		10/09/15 20:31
Vinyl acetate	49.3 U	98.6	30.6	ug/Kg	1		10/09/15 20:31
Vinyl chloride	4.93 U	9.86	3.06	ug/Kg	1		10/09/15 20:31
Xylenes (total)	37.0 U	74.0	22.5	ug/Kg	1		10/09/15 20:31
Surrogates							
1,2-Dichloroethane-D4 (surr)	113	71-136		%	1		10/09/15 20:31
4-Bromofluorobenzene (surr)	104	55-151		%	1		10/09/15 20:31
Toluene-d8 (surr)	107	85-116		%	1		10/09/15 20:31

Print Date: 10/27/2015 2:44:05PM

J flagging is activated

Results of Trip Blank B

Client Sample ID: **Trip Blank B**
 Client Project ID: **Ruby PACP 20266.014**
 Lab Sample ID: 1158702024
 Lab Project ID: 1158702

Collection Date: 09/28/15 14:10
 Received Date: 10/03/15 09:51
 Matrix: Soil/Solid (dry weight)
 Solids (%):
 Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS15327
 Analytical Method: SW8260B
 Analyst: ST
 Analytical Date/Time: 10/09/15 20:31
 Container ID: 1158702024-A

Prep Batch: VXX28043
 Prep Method: SW5035A
 Prep Date/Time: 09/28/15 14:10
 Prep Initial Wt./Vol.: 50.705 g
 Prep Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1722076 [SPT/9761]
Blank Lab ID: 1295829

Matrix: Soil/Solid (dry weight)

QC for Samples:

1158702001, 1158702002, 1158702003, 1158702004, 1158702005, 1158702006, 1158702007, 1158702008

Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	100			%

Batch Information

Analytical Batch: SPT9761
Analytical Method: SM21 2540G
Instrument:
Analyst: A.R
Analytical Date/Time: 10/6/2015 6:00:00PM

Print Date: 10/27/2015 2:44:10PM

Duplicate Sample Summary

Original Sample ID: 1155854058

Duplicate Sample ID: 1295832

QC for Samples:

Analysis Date: 10/06/2015 18:00

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	72.7	72.3	%	0.59	(< 15)

Batch Information

Analytical Batch: SPT9761

Analytical Method: SM21 2540G

Instrument:

Analyst: A.R

Print Date: 10/27/2015 2:44:10PM

Duplicate Sample Summary

Original Sample ID: 1155897013

Duplicate Sample ID: 1295833

QC for Samples:

1158702001, 1158702002, 1158702003, 1158702004, 1158702005, 1158702006, 1158702007, 1158702008

Analysis Date: 10/06/2015 18:00

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	84.3	84.8	%	0.52	(< 15)

Batch Information

Analytical Batch: SPT9761

Analytical Method: SM21 2540G

Instrument:

Analyst: A.R

Print Date: 10/27/2015 2:44:10PM

Duplicate Sample Summary

Original Sample ID: 1158705001

Duplicate Sample ID: 1295834

QC for Samples:

1158702001, 1158702002, 1158702003, 1158702004, 1158702005, 1158702006, 1158702007, 1158702008

Analysis Date: 10/06/2015 18:00

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	98.9	98.9	%	0.03	(< 15)

Batch Information

Analytical Batch: SPT9761

Analytical Method: SM21 2540G

Instrument:

Analyst: A.R

Print Date: 10/27/2015 2:44:10PM

Method Blank

Blank ID: MB for HBN 1722181 [SPT/9762]
Blank Lab ID: 1296126

Matrix: Soil/Solid (dry weight)

QC for Samples:

1158702009, 1158702010, 1158702011, 1158702012, 1158702013, 1158702014, 1158702015, 1158702016, 1158702017, 1158702018, 1158702019, 1158702020, 1158702021, 1158702022

Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	100			%

Batch Information

Analytical Batch: SPT9762
Analytical Method: SM21 2540G
Instrument:
Analyst: A.R
Analytical Date/Time: 10/7/2015 5:32:00PM

Print Date: 10/27/2015 2:44:13PM

Duplicate Sample Summary

Original Sample ID: 1155852006

Duplicate Sample ID: 1296128

QC for Samples:

Analysis Date: 10/07/2015 17:32

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	91.1	92.1	%	1.10	(< 15)

Batch Information

Analytical Batch: SPT9762

Analytical Method: SM21 2540G

Instrument:

Analyst: A.R

Print Date: 10/27/2015 2:44:14PM

Duplicate Sample Summary

Original Sample ID: 1155852012

Duplicate Sample ID: 1296129

QC for Samples:

1158702009, 1158702010, 1158702011, 1158702012, 1158702013, 1158702014, 1158702015, 1158702016, 1158702017, 1158702018, 1158702019, 1158702020, 1158702021, 1158702022

Analysis Date: 10/07/2015 17:32

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	88.2	87.4	%	0.92	(< 15)

Batch Information

Analytical Batch: SPT9762

Analytical Method: SM21 2540G

Instrument:

Analyst: A.R

Print Date: 10/27/2015 2:44:14PM

Duplicate Sample Summary

Original Sample ID: 1158702022

Duplicate Sample ID: 1296130

QC for Samples:

1158702009, 1158702010, 1158702011, 1158702012, 1158702013, 1158702014, 1158702015, 1158702016, 1158702017, 1158702018, 1158702019, 1158702020, 1158702021, 1158702022

Analysis Date: 10/07/2015 17:32

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	81.8	82.0	%	0.26	(< 15)

Batch Information

Analytical Batch: SPT9762

Analytical Method: SM21 2540G

Instrument:

Analyst: A.R

Print Date: 10/27/2015 2:44:14PM

Method Blank

Blank ID: MB for HBN 1722270 [VXX/28039]
Blank Lab ID: 1296515

Matrix: Soil/Solid (dry weight)

QC for Samples:

1158702002, 1158702003, 1158702004, 1158702005, 1158702006, 1158702007, 1158702008, 1158702009, 1158702010, 1158702011, 1158702012

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	103	50-150		%

Batch Information

Analytical Batch: VFC12722
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: CRD
Analytical Date/Time: 10/8/2015 10:48:00PM

Prep Batch: VXX28039
Prep Method: SW5035A
Prep Date/Time: 10/8/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:17PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28039]
 Blank Spike Lab ID: 1296518
 Date Analyzed: 10/08/2015 23:46

Spike Duplicate ID: LCSD for HBN 1158702 [VXX28039]
 Spike Duplicate Lab ID: 1296519
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702002, 1158702003, 1158702004, 1158702005, 1158702006, 1158702007, 1158702008, 1158702009, 1158702010, 1158702011, 1158702012

Results by AK101

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	13.4	108	12.5	13.6	109	(60-120)	1.00	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	106	106	1.25	107	107	(50-150)	1.10	

Batch Information

Analytical Batch: **VFC12722**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890 PID/FID**
 Analyst: **CRD**

Prep Batch: **VXX28039**
 Prep Method: **SW5035A**
 Prep Date/Time: **10/08/2015 08:00**
 Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:18PM

Method Blank

Blank ID: MB for HBN 1722270 [VXX/28039]
Blank Lab ID: 1296515

Matrix: Soil/Solid (dry weight)

QC for Samples:

1158702002, 1158702003, 1158702004, 1158702005, 1158702006, 1158702007, 1158702008, 1158702009, 1158702010, 1158702011, 1158702012

Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	8.75J	25.0	7.80	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	106	72-119		%

Batch Information

Analytical Batch: VFC12722
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: CRD
Analytical Date/Time: 10/8/2015 10:48:00PM

Prep Batch: VXX28039
Prep Method: SW5035A
Prep Date/Time: 10/8/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28039]
 Blank Spike Lab ID: 1296516
 Date Analyzed: 10/08/2015 23:08

Spike Duplicate ID: LCSD for HBN 1158702 [VXX28039]
 Spike Duplicate Lab ID: 1296517
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702002, 1158702003, 1158702004, 1158702005, 1158702006, 1158702007, 1158702008, 1158702009, 1158702010, 1158702011, 1158702012

Results by SW8021B

Parameter	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	1250	1400	112	1250	1450	116	(75-125)	3.30	(< 20)
Ethylbenzene	1250	1380	110	1250	1420	113	(75-125)	2.70	(< 20)
o-Xylene	1250	1340	107	1250	1380	111	(75-125)	3.70	(< 20)
P & M -Xylene	2500	2740	110	2500	2840	114	(80-125)	3.50	(< 20)
Toluene	1250	1390	111	1250	1420	113	(70-125)	2.00	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	108	108	1250	109	109	(72-119)	0.15	

Batch Information

Analytical Batch: VFC12722
 Analytical Method: SW8021B
 Instrument: Agilent 7890 PID/FID
 Analyst: CRD

Prep Batch: VXX28039
 Prep Method: SW5035A
 Prep Date/Time: 10/08/2015 08:00
 Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

Matrix Spike Summary

Original Sample ID: 1158702006
MS Sample ID: 1296520 MS
MSD Sample ID: 1296521 MSD

Analysis Date: 10/09/2015 2:58
Analysis Date: 10/09/2015 3:17
Analysis Date: 10/09/2015 3:37
Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702002, 1158702003, 1158702004, 1158702005, 1158702006, 1158702007, 1158702008, 1158702009, 1158702010, 1158702011, 1158702012

Results by SW8021B

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	9.50U	1506	1715	114	1506	1761	117	75-125	2.50	(< 20)
Ethylbenzene	19.1U	1506	1680	111	1506	1727	114	75-125	2.80	(< 20)
o-Xylene	17.9J	1506	1669	109	1506	1715	112	75-125	2.70	(< 20)
P & M -Xylene	34.3J	3013	3418	112	3013	3511	115	80-125	2.70	(< 20)
Toluene	24.8J	1506	1703	111	1506	1750	115	70-125	2.90	(< 20)

Surrogates

1,4-Difluorobenzene (surr)	1506	1645	110	1506	1657	110	72-119	0.11
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Batch Information

Analytical Batch: VFC12722
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: CRD
Analytical Date/Time: 10/9/2015 3:17:00AM

Prep Batch: VXX28039
Prep Method: AK101 Extraction (S)
Prep Date/Time: 10/8/2015 8:00:00AM
Prep Initial Wt./Vol.: 48.08g
Prep Extract Vol: 25.00mL

Print Date: 10/27/2015 2:44:21PM

Method Blank

Blank ID: MB for HBN 1722332 [VXX/28043]
Blank Lab ID: 1296774

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702019, 1158702020, 1158702021, 1158702022, 1158702024

Results by SW8260B

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	12.5U	25.0	7.80	ug/Kg
1,1,1-Trichloroethane	12.5U	25.0	7.80	ug/Kg
1,1,2,2-Tetrachloroethane	6.25U	12.5	3.90	ug/Kg
1,1,2-Trichloroethane	5.00U	10.0	3.10	ug/Kg
1,1-Dichloroethane	12.5U	25.0	7.80	ug/Kg
1,1-Dichloroethene	12.5U	25.0	7.80	ug/Kg
1,1-Dichloropropene	12.5U	25.0	7.80	ug/Kg
1,2,3-Trichlorobenzene	25.0U	50.0	15.0	ug/Kg
1,2,3-Trichloropropane	12.5U	25.0	7.80	ug/Kg
1,2,4-Trichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/Kg
1,2-Dibromo-3-chloropropane	50.0U	100	31.0	ug/Kg
1,2-Dibromoethane	5.00U	10.0	3.10	ug/Kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2-Dichloroethane	5.00U	10.0	3.10	ug/Kg
1,2-Dichloropropane	5.00U	10.0	3.10	ug/Kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/Kg
1,3-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,3-Dichloropropane	5.00U	10.0	3.10	ug/Kg
1,4-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
2,2-Dichloropropane	12.5U	25.0	7.80	ug/Kg
2-Butanone (MEK)	125U	250	78.0	ug/Kg
2-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
2-Hexanone	125U	250	78.0	ug/Kg
4-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
4-Isopropyltoluene	12.5U	25.0	7.80	ug/Kg
4-Methyl-2-pentanone (MIBK)	125U	250	78.0	ug/Kg
Benzene	6.25U	12.5	3.90	ug/Kg
Bromobenzene	12.5U	25.0	7.80	ug/Kg
Bromochloromethane	12.5U	25.0	7.80	ug/Kg
Bromodichloromethane	12.5U	25.0	7.80	ug/Kg
Bromoform	12.5U	25.0	7.80	ug/Kg
Bromomethane	100U	200	62.0	ug/Kg
Carbon disulfide	50.0U	100	31.0	ug/Kg
Carbon tetrachloride	6.25U	12.5	3.90	ug/Kg
Chlorobenzene	12.5U	25.0	7.80	ug/Kg
Chloroethane	100U	200	62.0	ug/Kg
Chloroform	12.5U	25.0	7.80	ug/Kg

Print Date: 10/27/2015 2:44:23PM

Method Blank

Blank ID: MB for HBN 1722332 [VXX/28043]

Blank Lab ID: 1296774

Matrix: Soil/Solid (dry weight)

QC for Samples:

1158702019, 1158702020, 1158702021, 1158702022, 1158702024

Results by SW8260B

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	12.5U	25.0	7.80	ug/Kg
cis-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
cis-1,3-Dichloropropene	12.5U	25.0	7.80	ug/Kg
Dibromochloromethane	12.5U	25.0	7.80	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Freon-113	50.0U	100	31.0	ug/Kg
Hexachlorobutadiene	25.0U	50.0	15.0	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methylene chloride	50.0U	100	31.0	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	25.0U	50.0	15.0	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
n-Propylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Styrene	12.5U	25.0	7.80	ug/Kg
tert-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Tetrachloroethene	6.25U	12.5	3.90	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
trans-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	12.5U	25.0	7.80	ug/Kg
Trichloroethene	6.25U	12.5	3.90	ug/Kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/Kg
Vinyl acetate	50.0U	100	31.0	ug/Kg
Vinyl chloride	5.00U	10.0	3.10	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg

Surrogates

1,2-Dichloroethane-D4 (surr)	109	71-136	%
4-Bromofluorobenzene (surr)	97.1	55-151	%
Toluene-d8 (surr)	102	85-116	%

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Method Blank

Blank ID: MB for HBN 1722332 [VXX/28043]
Blank Lab ID: 1296774

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702019, 1158702020, 1158702021, 1158702022, 1158702024

Results by SW8260B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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Batch Information

Analytical Batch: VMS15327
Analytical Method: SW8260B
Instrument: VQA 7890/5975 GC/MS
Analyst: ST
Analytical Date/Time: 10/9/2015 6:09:00PM

Prep Batch: VXX28043
Prep Method: SW5035A
Prep Date/Time: 10/9/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:23PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28043]
 Blank Spike Lab ID: 1296775
 Date Analyzed: 10/09/2015 18:45

Spike Duplicate ID: LCSD for HBN 1158702
 [VXX28043]
 Spike Duplicate Lab ID: 1296776
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702019, 1158702020, 1158702021, 1158702022, 1158702024

Results by SW8260B

Parameter	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	750	816	109	750	823	110	(78-125)	0.85	(< 20)
1,1,1-Trichloroethane	750	882	118	750	886	118	(73-130)	0.48	(< 20)
1,1,2,2-Tetrachloroethane	750	710	95	750	734	98	(70-124)	3.30	(< 20)
1,1,2-Trichloroethane	750	742	99	750	775	103	(78-121)	4.30	(< 20)
1,1-Dichloroethane	750	770	103	750	782	104	(76-125)	1.50	(< 20)
1,1-Dichloroethene	750	811	108	750	1050	140	* (70-131)	25.70	* (< 20)
1,1-Dichloropropene	750	786	105	750	804	107	(76-125)	2.20	(< 20)
1,2,3-Trichlorobenzene	750	786	105	750	867	116	(66-130)	9.70	(< 20)
1,2,3-Trichloropropane	750	727	97	750	749	100	(73-125)	2.90	(< 20)
1,2,4-Trichlorobenzene	750	826	110	750	867	116	(67-129)	4.90	(< 20)
1,2,4-Trimethylbenzene	750	787	105	750	830	111	(75-123)	5.30	(< 20)
1,2-Dibromo-3-chloropropane	750	760	101	750	787	105	(61-132)	3.50	(< 20)
1,2-Dibromoethane	750	784	105	750	785	105	(78-122)	0.10	(< 20)
1,2-Dichlorobenzene	750	718	96	750	749	100	(78-121)	4.10	(< 20)
1,2-Dichloroethane	750	778	104	750	777	104	(73-128)	0.16	(< 20)
1,2-Dichloropropane	750	749	100	750	760	101	(76-123)	1.50	(< 20)
1,3,5-Trimethylbenzene	750	790	105	750	826	110	(73-124)	4.50	(< 20)
1,3-Dichlorobenzene	750	726	97	750	752	100	(77-121)	3.50	(< 20)
1,3-Dichloropropane	750	774	103	750	783	104	(77-121)	1.20	(< 20)
1,4-Dichlorobenzene	750	733	98	750	753	100	(75-120)	2.70	(< 20)
2,2-Dichloropropane	750	800	107	750	740	99	(67-133)	7.80	(< 20)
2-Butanone (MEK)	2250	1880	84	2250	1940	86	(51-148)	2.90	(< 20)
2-Chlorotoluene	750	752	100	750	772	103	(75-122)	2.60	(< 20)
2-Hexanone	2250	2110	94	2250	2070	92	(53-145)	2.00	(< 20)
4-Chlorotoluene	750	745	99	750	801	107	(72-124)	7.30	(< 20)
4-Isopropyltoluene	750	721	96	750	729	97	(73-127)	1.10	(< 20)
4-Methyl-2-pentanone (MIBK)	2250	2030	90	2250	2100	93	(65-135)	3.70	(< 20)
Benzene	750	746	100	750	767	102	(77-121)	2.70	(< 20)
Bromobenzene	750	732	98	750	772	103	(78-121)	5.40	(< 20)
Bromochloromethane	750	738	98	750	735	98	(78-125)	0.41	(< 20)
Bromodichloromethane	750	815	109	750	812	108	(75-127)	0.37	(< 20)
Bromoform	750	810	108	750	798	106	(67-132)	1.60	(< 20)
Bromomethane	750	814	109	750	1030	137	(53-143)	23.40	* (< 20)
Carbon disulfide	1130	1190	106	1130	1510	134	* (63-132)	24.00	* (< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28043]
 Blank Spike Lab ID: 1296775
 Date Analyzed: 10/09/2015 18:45

Spike Duplicate ID: LCSD for HBN 1158702
 [VXX28043]
 Spike Duplicate Lab ID: 1296776
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702019, 1158702020, 1158702021, 1158702022, 1158702024

Results by SW8260B

Parameter	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Carbon tetrachloride	750	831	111	750	825	110	(70-135)	0.73	(< 20)
Chlorobenzene	750	730	97	750	754	101	(79-120)	3.20	(< 20)
Chloroethane	750	782	104	750	978	130	(59-139)	22.30	* (< 20)
Chloroform	750	744	99	750	758	101	(78-123)	1.90	(< 20)
Chloromethane	750	720	96	750	748	100	(50-136)	3.80	(< 20)
cis-1,2-Dichloroethene	750	713	95	750	753	100	(77-123)	5.50	(< 20)
cis-1,3-Dichloropropene	750	818	109	750	815	109	(74-126)	0.34	(< 20)
Dibromochloromethane	750	824	110	750	816	109	(74-126)	1.10	(< 20)
Dibromomethane	750	722	96	750	766	102	(78-125)	6.00	(< 20)
Dichlorodifluoromethane	750	850	113	750	835	111	(29-149)	1.80	(< 20)
Ethylbenzene	750	741	99	750	754	100	(76-122)	1.60	(< 20)
Freon-113	1130	1180	105	1130	1450	129	(66-136)	20.20	* (< 20)
Hexachlorobutadiene	750	941	125	750	919	123	(61-135)	2.30	(< 20)
Isopropylbenzene (Cumene)	750	821	109	750	810	108	(68-134)	1.30	(< 20)
Methylene chloride	750	717	96	750	813	108	(70-128)	12.50	(< 20)
Methyl-t-butyl ether	1130	1210	108	1130	1240	110	(73-125)	2.00	(< 20)
Naphthalene	750	739	99	750	851	113	(62-129)	14.10	(< 20)
n-Butylbenzene	750	776	103	750	761	101	(70-128)	1.90	(< 20)
n-Propylbenzene	750	707	94	750	723	96	(73-125)	2.20	(< 20)
o-Xylene	750	725	97	750	743	99	(77-123)	2.60	(< 20)
P & M -Xylene	1500	1500	100	1500	1510	101	(77-124)	1.10	(< 20)
sec-Butylbenzene	750	759	101	750	755	101	(73-126)	0.53	(< 20)
Styrene	750	701	94	750	708	94	(76-124)	0.96	(< 20)
tert-Butylbenzene	750	726	97	750	732	98	(73-125)	0.79	(< 20)
Tetrachloroethene	750	740	99	750	757	101	(73-128)	2.20	(< 20)
Toluene	750	747	100	750	765	102	(77-121)	2.40	(< 20)
trans-1,2-Dichloroethene	750	749	100	750	758	101	(74-125)	1.30	(< 20)
trans-1,3-Dichloropropene	750	799	107	750	783	104	(71-130)	2.10	(< 20)
Trichloroethene	750	804	107	750	824	110	(77-123)	2.50	(< 20)
Trichlorofluoromethane	750	1030	137	750	1050	140	(62-140)	2.10	(< 20)
Vinyl acetate	750	803	107	750	764	102	(50-151)	4.90	(< 20)
Vinyl chloride	750	773	103	750	931	124	(56-135)	18.50	(< 20)
Xylenes (total)	2250	2220	99	2250	2260	100	(78-124)	1.60	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28043]
 Blank Spike Lab ID: 1296775
 Date Analyzed: 10/09/2015 18:45

Spike Duplicate ID: LCSD for HBN 1158702 [VXX28043]
 Spike Duplicate Lab ID: 1296776
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702019, 1158702020, 1158702021, 1158702022, 1158702024

Results by SW8260B

Parameter	Blank Spike (%)			Spike Duplicate (%)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Surrogates									
1,2-Dichloroethane-D4 (surr)	750	104	104	750	104	104	(71-136)	0.19	
4-Bromofluorobenzene (surr)	750	96.1	96	750	103	103	(55-151)	6.60	
Toluene-d8 (surr)	750	105	105	750	109	109	(85-116)	3.30	

Batch Information

Analytical Batch: VMS15327
 Analytical Method: SW8260B
 Instrument: VQA 7890/5975 GC/MS
 Analyst: ST

Prep Batch: VXX28043
 Prep Method: SW5035A
 Prep Date/Time: 10/09/2015 08:00
 Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:24PM

Matrix Spike Summary

Original Sample ID: 1155871010
MS Sample ID: 1296777 MS
MSD Sample ID: 1296778 MSD

Analysis Date: 10/09/2015 20:47
Analysis Date: 10/09/2015 19:27
Analysis Date: 10/09/2015 19:43
Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702019, 1158702020, 1158702021, 1158702022, 1158702024

Results by SW8260B

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	14.9U	733	805	110	733	823	112	78-125	2.10	(< 20)
1,1,1-Trichloroethane	14.9U	733	873	119	733	862	118	73-130	1.30	(< 20)
1,1,2,2-Tetrachloroethane	7.45U	733	705	96	733	726	99	70-124	2.80	(< 20)
1,1,2-Trichloroethane	5.95U	733	737	101	733	771	105	78-121	4.40	(< 20)
1,1-Dichloroethane	14.9U	733	756	103	733	754	103	76-125	0.23	(< 20)
1,1-Dichloroethene	14.9U	733	790	108	733	782	107	70-131	0.93	(< 20)
1,1-Dichloropropene	14.9U	733	781	107	733	781	107	76-125	0.03	(< 20)
1,2,3-Trichlorobenzene	29.7U	733	822	112	733	909	124	66-130	10.20	(< 20)
1,2,3-Trichloropropane	14.9U	733	720	98	733	760	104	73-125	5.30	(< 20)
1,2,4-Trichlorobenzene	14.9U	733	841	115	733	874	119	67-129	3.80	(< 20)
1,2,4-Trimethylbenzene	29.7U	733	789	108	733	796	109	75-123	0.96	(< 20)
1,2-Dibromo-3-chloropropane	59.5U	733	777	106	733	787	107	61-132	1.20	(< 20)
1,2-Dibromoethane	5.95U	733	768	105	733	793	108	78-122	3.30	(< 20)
1,2-Dichlorobenzene	14.9U	733	702	96	733	728	99	78-121	3.60	(< 20)
1,2-Dichloroethane	5.95U	733	767	105	733	761	104	73-128	0.74	(< 20)
1,2-Dichloropropane	5.95U	733	731	100	733	740	101	76-123	1.20	(< 20)
1,3,5-Trimethylbenzene	14.9U	733	775	106	733	792	108	73-124	2.00	(< 20)
1,3-Dichlorobenzene	14.9U	733	701	96	733	725	99	77-121	3.20	(< 20)
1,3-Dichloropropane	5.95U	733	758	103	733	777	106	77-121	2.40	(< 20)
1,4-Dichlorobenzene	14.9U	733	707	96	733	735	100	75-120	3.90	(< 20)
2,2-Dichloropropane	14.9U	733	791	108	733	773	105	67-133	2.30	(< 20)
2-Butanone (MEK)	149U	2201	1925	88	2201	2113	96	51-148	9.20	(< 20)
2-Chlorotoluene	14.9U	733	735	100	733	746	102	75-122	1.50	(< 20)
2-Hexanone	149U	2201	2102	96	2201	2212	101	53-145	5.20	(< 20)
4-Chlorotoluene	14.9U	733	744	102	733	761	104	72-124	2.20	(< 20)
4-Isopropyltoluene	14.9U	733	716	98	733	715	97	73-127	0.24	(< 20)
4-Methyl-2-pentanone (MIBK)	149U	2201	2091	95	2201	2168	98	65-135	3.60	(< 20)
Benzene	7.45U	733	740	101	733	741	101	77-121	0.20	(< 20)
Bromobenzene	14.9U	733	712	97	733	742	101	78-121	4.20	(< 20)
Bromochloromethane	14.9U	733	728	99	733	712	97	78-125	2.20	(< 20)
Bromodichloromethane	14.9U	733	803	110	733	799	109	75-127	0.55	(< 20)
Bromoform	14.9U	733	798	109	733	825	113	67-132	3.30	(< 20)
Bromomethane	119U	733	777	106	733	772	105	53-143	0.57	(< 20)
Carbon disulfide	59.5U	1100	1173	107	1100	1150	105	63-132	1.80	(< 20)
Carbon tetrachloride	7.45U	733	826	113	733	808	110	70-135	2.30	(< 20)
Chlorobenzene	14.9U	733	721	98	733	726	99	79-120	0.68	(< 20)
Chloroethane	119U	733	779	106	733	782	107	59-139	0.34	(< 20)

Print Date: 10/27/2015 2:44:25PM

Matrix Spike Summary

Original Sample ID: 1155871010
MS Sample ID: 1296777 MS
MSD Sample ID: 1296778 MSD

Analysis Date: 10/09/2015 20:47
Analysis Date: 10/09/2015 19:27
Analysis Date: 10/09/2015 19:43
Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702019, 1158702020, 1158702021, 1158702022, 1158702024

Results by SW8260B

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Chloroform	14.9U	733	737	100	733	728	99	78-123	1.20	(< 20)
Chloromethane	14.9U	733	701	96	733	690	94	50-136	1.50	(< 20)
cis-1,2-Dichloroethene	14.9U	733	709	97	733	707	96	77-123	0.24	(< 20)
cis-1,3-Dichloropropene	14.9U	733	816	111	733	813	111	74-126	0.45	(< 20)
Dibromochloromethane	14.9U	733	804	110	733	815	111	74-126	1.30	(< 20)
Dibromomethane	14.9U	733	725	99	733	743	101	78-125	2.50	(< 20)
Dichlorodifluoromethane	29.7U	733	827	113	733	806	110	29-149	2.50	(< 20)
Ethylbenzene	14.9U	733	731	100	733	739	101	76-122	0.96	(< 20)
Freon-113	59.5U	1100	1173	107	1100	1139	104	66-136	2.50	(< 20)
Hexachlorobutadiene	29.7U	733	929	127	733	947	129	61-135	2.00	(< 20)
Isopropylbenzene (Cumene)	14.9U	733	798	109	733	781	107	68-134	2.00	(< 20)
Methylene chloride	59.5U	733	706	96	733	696	95	70-128	1.40	(< 20)
Methyl-t-butyl ether	59.5U	1100	1206	110	1100	1217	111	73-125	0.54	(< 20)
Naphthalene	29.7U	733	787	107	733	834	114	62-129	5.80	(< 20)
n-Butylbenzene	14.9U	733	769	105	733	753	103	70-128	2.00	(< 20)
n-Propylbenzene	14.9U	733	696	95	733	687	94	73-125	1.30	(< 20)
o-Xylene	14.9U	733	717	98	733	716	98	77-123	0.14	(< 20)
P & M -Xylene	29.7U	1471	1460	100	1471	1471	100	77-124	0.52	(< 20)
sec-Butylbenzene	14.9U	733	744	102	733	728	99	73-126	2.20	(< 20)
Styrene	14.9U	733	688	94	733	687	94	76-124	0.07	(< 20)
tert-Butylbenzene	14.9U	733	715	98	733	698	95	73-125	2.40	(< 20)
Tetrachloroethene	7.45U	733	739	101	733	749	102	73-128	1.30	(< 20)
Toluene	16.6J	733	744	99	733	758	101	77-121	1.80	(< 20)
trans-1,2-Dichloroethene	14.9U	733	740	101	733	733	100	74-125	0.90	(< 20)
trans-1,3-Dichloropropene	14.9U	733	781	106	733	778	106	71-130	0.38	(< 20)
Trichloroethene	7.45U	733	803	110	733	800	109	77-123	0.49	(< 20)
Trichlorofluoromethane	29.7U	733	986	134	733	806	110	62-140	20.00	(< 20)
Vinyl acetate	59.5U	733	812	111	733	810	110	50-151	0.24	(< 20)
Vinyl chloride	5.95U	733	765	104	733	742	101	56-135	3.00	(< 20)
Xylenes (total)	44.5U	2201	2179	99	2201	2190	99	78-124	0.30	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		733	744	101	733	747	102	71-136	0.33	
4-Bromofluorobenzene (surr)		1958	1637	84	1958	1704	87	55-151	3.40	
Toluene-d8 (surr)		733	758	103	733	771	105	85-116	1.80	

Print Date: 10/27/2015 2:44:25PM

Matrix Spike Summary

Original Sample ID: 1155871010
MS Sample ID: 1296777 MS
MSD Sample ID: 1296778 MSD

Analysis Date:
Analysis Date: 10/09/2015 19:27
Analysis Date: 10/09/2015 19:43
Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702019, 1158702020, 1158702021, 1158702022, 1158702024

Results by SW8260B

Parameter	Sample	Matrix Spike (%)			Spike Duplicate (%)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			

Batch Information

Analytical Batch: VMS15327
Analytical Method: SW8260B
Instrument: VQA 7890/5975 GC/MS
Analyst: ST
Analytical Date/Time: 10/9/2015 7:27:00PM

Prep Batch: VXX28043
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 10/9/2015 8:00:00AM
Prep Initial Wt./Vol.: 56.57g
Prep Extract Vol: 25.00mL

Print Date: 10/27/2015 2:44:25PM

Method Blank

Blank ID: MB for HBN 1722607 [VXX/28062]
Blank Lab ID: 1297265

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702001, 1158702002, 1158702023

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	1.68J	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	93.7	50-150		%

Batch Information

Analytical Batch: VFC12737
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: KAS
Analytical Date/Time: 10/11/2015 5:55:00PM

Prep Batch: VXX28062
Prep Method: SW5035A
Prep Date/Time: 10/11/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:26PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28062]
 Blank Spike Lab ID: 1297268
 Date Analyzed: 10/11/2015 15:43

Spike Duplicate ID: LCSD for HBN 1158702
 [VXX28062]
 Spike Duplicate Lab ID: 1297269
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702001, 1158702002, 1158702023

Results by AK101

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	14.3	114	12.5	14.2	113	(60-120)	0.52	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	93.9	94	1.25	92.6	93	(50-150)	1.40	

Batch Information

Analytical Batch: **VFC12737**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890A PID/FID**
 Analyst: **KAS**

Prep Batch: **VXX28062**
 Prep Method: **SW5035A**
 Prep Date/Time: **10/11/2015 08:00**
 Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:27PM

Method Blank

Blank ID: MB for HBN 1722607 [VXX/28062]
Blank Lab ID: 1297265

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702001, 1158702002, 1158702023

Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	12.5J	25.0	7.80	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	95.3	72-119		%

Batch Information

Analytical Batch: VFC12737
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: KAS
Analytical Date/Time: 10/11/2015 5:55:00PM

Prep Batch: VXX28062
Prep Method: SW5035A
Prep Date/Time: 10/11/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28062]
 Blank Spike Lab ID: 1297266
 Date Analyzed: 10/11/2015 15:05

Spike Duplicate ID: LCSD for HBN 1158702 [VXX28062]
 Spike Duplicate Lab ID: 1297267
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702001, 1158702002, 1158702023

Results by SW8021B

Parameter	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	1250	1470	118	1250	1480	118	(75-125)	0.32	(< 20)
Ethylbenzene	1250	1390	112	1250	1410	113	(75-125)	0.85	(< 20)
o-Xylene	1250	1350	108	1250	1360	109	(75-125)	1.10	(< 20)
P & M -Xylene	2500	2750	110	2500	2780	111	(80-125)	0.92	(< 20)
Toluene	1250	1480	118	1250	1490	119	(70-125)	0.39	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	96.4	96	1250	96.8	97	(72-119)	0.38	

Batch Information

Analytical Batch: VFC12737
 Analytical Method: SW8021B
 Instrument: Agilent 7890A PID/FID
 Analyst: KAS

Prep Batch: VXX28062
 Prep Method: SW5035A
 Prep Date/Time: 10/11/2015 08:00
 Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

Matrix Spike Summary

Original Sample ID: 1158702001
MS Sample ID: 1298171 MS
MSD Sample ID: 1298172 MSD

Analysis Date: 10/11/2015 20:26
Analysis Date: 10/11/2015 21:04
Analysis Date: 10/11/2015 21:22
Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702001, 1158702002, 1158702023

Results by SW8021B

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	8.80U	1407	1613	115	1407	1579	112	75-125	2.30	(< 20)
Ethylbenzene	17.6U	1407	1545	110	1407	1522	108	75-125	1.70	(< 20)
o-Xylene	37.4	1407	1510	105	1407	1487	103	75-125	1.10	(< 20)
P & M -Xylene	47.2J	2803	3009	106	2803	2975	104	80-125	1.40	(< 20)
Toluene	17.6U	1407	1602	114	1407	1556	111	70-125	2.80	(< 20)

Surrogates

1,4-Difluorobenzene (surr)	1407	1362	97	1407	1350	97	72-119	0.41
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Batch Information

Analytical Batch: VFC12737
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: KAS
Analytical Date/Time: 10/11/2015 9:04:00PM

Prep Batch: VXX28062
Prep Method: AK101 Extraction (S)
Prep Date/Time: 10/11/2015 8:00:00AM
Prep Initial Wt./Vol.: 50.93g
Prep Extract Vol: 25.00mL

Print Date: 10/27/2015 2:44:32PM

Method Blank

Blank ID: MB for HBN 1722618 [VXX/28064]
Blank Lab ID: 1297311

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702018

Results by SW8260B

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	12.5U	25.0	7.80	ug/Kg
1,1,1-Trichloroethane	12.5U	25.0	7.80	ug/Kg
1,1,2,2-Tetrachloroethane	6.25U	12.5	3.90	ug/Kg
1,1,2-Trichloroethane	5.00U	10.0	3.10	ug/Kg
1,1-Dichloroethane	12.5U	25.0	7.80	ug/Kg
1,1-Dichloroethene	12.5U	25.0	7.80	ug/Kg
1,1-Dichloropropene	12.5U	25.0	7.80	ug/Kg
1,2,3-Trichlorobenzene	25.0U	50.0	15.0	ug/Kg
1,2,3-Trichloropropane	12.5U	25.0	7.80	ug/Kg
1,2,4-Trichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/Kg
1,2-Dibromo-3-chloropropane	50.0U	100	31.0	ug/Kg
1,2-Dibromoethane	5.00U	10.0	3.10	ug/Kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2-Dichloroethane	5.00U	10.0	3.10	ug/Kg
1,2-Dichloropropane	5.00U	10.0	3.10	ug/Kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/Kg
1,3-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,3-Dichloropropane	5.00U	10.0	3.10	ug/Kg
1,4-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
2,2-Dichloropropane	12.5U	25.0	7.80	ug/Kg
2-Butanone (MEK)	125U	250	78.0	ug/Kg
2-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
2-Hexanone	125U	250	78.0	ug/Kg
4-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
4-Isopropyltoluene	12.5U	25.0	7.80	ug/Kg
4-Methyl-2-pentanone (MIBK)	125U	250	78.0	ug/Kg
Benzene	6.25U	12.5	3.90	ug/Kg
Bromobenzene	12.5U	25.0	7.80	ug/Kg
Bromochloromethane	12.5U	25.0	7.80	ug/Kg
Bromodichloromethane	12.5U	25.0	7.80	ug/Kg
Bromoform	12.5U	25.0	7.80	ug/Kg
Bromomethane	100U	200	62.0	ug/Kg
Carbon disulfide	50.0U	100	31.0	ug/Kg
Carbon tetrachloride	6.25U	12.5	3.90	ug/Kg
Chlorobenzene	12.5U	25.0	7.80	ug/Kg
Chloroethane	100U	200	62.0	ug/Kg
Chloroform	12.5U	25.0	7.80	ug/Kg

Print Date: 10/27/2015 2:44:33PM

Method Blank

Blank ID: MB for HBN 1722618 [VXX/28064]
Blank Lab ID: 1297311

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702018

Results by SW8260B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Chloromethane	12.5U	25.0	7.80	ug/Kg
cis-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
cis-1,3-Dichloropropene	12.5U	25.0	7.80	ug/Kg
Dibromochloromethane	12.5U	25.0	7.80	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Freon-113	50.0U	100	31.0	ug/Kg
Hexachlorobutadiene	25.0U	50.0	15.0	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methylene chloride	50.0U	100	31.0	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	25.0U	50.0	15.0	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
n-Propylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Styrene	12.5U	25.0	7.80	ug/Kg
tert-Butylbenzene	8.50J	25.0	7.80	ug/Kg
Tetrachloroethene	6.25U	12.5	3.90	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
trans-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	12.5U	25.0	7.80	ug/Kg
Trichloroethene	6.25U	12.5	3.90	ug/Kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/Kg
Vinyl acetate	50.0U	100	31.0	ug/Kg
Vinyl chloride	5.00U	10.0	3.10	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	105	71-136		%
4-Bromofluorobenzene (surr)	95.4	55-151		%
Toluene-d8 (surr)	111	85-116		%

Method Blank

Blank ID: MB for HBN 1722618 [VXX/28064]
Blank Lab ID: 1297311

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702018

Results by SW8260B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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Batch Information

Analytical Batch: VMS15331
Analytical Method: SW8260B
Instrument: VQA 7890/5975 GC/MS
Analyst: ST
Analytical Date/Time: 10/12/2015 4:03:00PM

Prep Batch: VXX28064
Prep Method: SW5035A
Prep Date/Time: 10/12/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:33PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28064]

Blank Spike Lab ID: 1297312

Date Analyzed: 10/12/2015 16:49

Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702018

Results by SW8260B

Blank Spike (ug/Kg)				
Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	813	108	(78-125)
1,1,1-Trichloroethane	750	905	121	(73-130)
1,1,2,2-Tetrachloroethane	750	715	95	(70-124)
1,1,2-Trichloroethane	750	766	102	(78-121)
1,1-Dichloroethane	750	772	103	(76-125)
1,1-Dichloroethene	750	1150	154 *	(70-131)
1,1-Dichloropropene	750	798	106	(76-125)
1,2,3-Trichlorobenzene	750	1240	165 *	(66-130)
1,2,3-Trichloropropane	750	761	101	(73-125)
1,2,4-Trichlorobenzene	750	999	133 *	(67-129)
1,2,4-Trimethylbenzene	750	765	102	(75-123)
1,2-Dibromo-3-chloropropane	750	874	117	(61-132)
1,2-Dibromoethane	750	819	109	(78-122)
1,2-Dichlorobenzene	750	752	100	(78-121)
1,2-Dichloroethane	750	812	108	(73-128)
1,2-Dichloropropane	750	766	102	(76-123)
1,3,5-Trimethylbenzene	750	749	100	(73-124)
1,3-Dichlorobenzene	750	733	98	(77-121)
1,3-Dichloropropane	750	780	104	(77-121)
1,4-Dichlorobenzene	750	761	101	(75-120)
2,2-Dichloropropane	750	800	107	(67-133)
2-Butanone (MEK)	2250	2170	96	(51-148)
2-Chlorotoluene	750	701	93	(75-122)
2-Hexanone	2250	2350	105	(53-145)
4-Chlorotoluene	750	711	95	(72-124)
4-Isopropyltoluene	750	764	102	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2200	98	(65-135)
Benzene	750	742	99	(77-121)
Bromobenzene	750	703	94	(78-121)
Bromochloromethane	750	752	100	(78-125)
Bromodichloromethane	750	833	111	(75-127)
Bromoform	750	804	107	(67-132)
Bromomethane	750	1060	141	(53-143)
Carbon disulfide	1130	1720	153 *	(63-132)

Print Date: 10/27/2015 2:44:35PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28064]

Blank Spike Lab ID: 1297312

Date Analyzed: 10/12/2015 16:49

Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702018

Results by SW8260B

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Carbon tetrachloride	750	857	114	(70-135)
Chlorobenzene	750	713	95	(79-120)
Chloroethane	750	1030	137	(59-139)
Chloroform	750	752	100	(78-123)
Chloromethane	750	812	108	(50-136)
cis-1,2-Dichloroethene	750	717	96	(77-123)
cis-1,3-Dichloropropene	750	843	112	(74-126)
Dibromochloromethane	750	851	113	(74-126)
Dibromomethane	750	792	106	(78-125)
Dichlorodifluoromethane	750	847	113	(29-149)
Ethylbenzene	750	732	98	(76-122)
Freon-113	1130	1570	140	*
Hexachlorobutadiene	750	1080	144	*
Isopropylbenzene (Cumene)	750	726	97	(68-134)
Methylene chloride	750	1030	138	*
Methyl-t-butyl ether	1130	1380	122	(73-125)
Naphthalene	750	871	116	(62-129)
n-Butylbenzene	750	803	107	(70-128)
n-Propylbenzene	750	644	86	(73-125)
o-Xylene	750	683	91	(77-123)
P & M -Xylene	1500	1420	95	(77-124)
sec-Butylbenzene	750	725	97	(73-126)
Styrene	750	645	86	(76-124)
tert-Butylbenzene	750	675	90	(73-125)
Tetrachloroethene	750	721	96	(73-128)
Toluene	750	701	94	(77-121)
trans-1,2-Dichloroethene	750	1040	138	*
trans-1,3-Dichloropropene	750	767	102	(71-130)
Trichloroethene	750	834	111	(77-123)
Trichlorofluoromethane	750	1180	158	*
Vinyl acetate	750	800	107	(50-151)
Vinyl chloride	750	976	130	(56-135)
Xylenes (total)	2250	2110	94	(78-124)

Print Date: 10/27/2015 2:44:35PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28064]

Blank Spike Lab ID: 1297312

Date Analyzed: 10/12/2015 16:49

Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702018

Results by SW8260B

<u>Parameter</u>	<u>Spike</u>	Blank Spike (%)		<u>CL</u>
		<u>Result</u>	<u>Rec (%)</u>	
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	107	107	(71-136)
4-Bromofluorobenzene (surr)	750	91.7	92	(55-151)
Toluene-d8 (surr)	750	101	101	(85-116)

Batch Information

Analytical Batch: VMS15331

Analytical Method: SW8260B

Instrument: VQA 7890/5975 GC/MS

Analyst: ST

Prep Batch: VXX28064

Prep Method: SW5035A

Prep Date/Time: 10/12/2015 08:00

Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL

Dupe Init Wt./Vol.: Extract Vol:

Print Date: 10/27/2015 2:44:35PM

Matrix Spike Summary

Original Sample ID: 1297782
MS Sample ID: 1297313 MS
MSD Sample ID: 1297314 MSD

Analysis Date: 10/12/2015 18:56
Analysis Date: 10/12/2015 17:20
Analysis Date: 10/12/2015 17:36
Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702018

Results by SW8260B

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	13.1U	783	886	113	783	894	114	78-125	0.85	(< 20)
1,1,1-Trichloroethane	13.1U	783	868	111	783	905	116	73-130	4.20	(< 20)
1,1,2,2-Tetrachloroethane	6.55U	783	706	90	783	784	100	70-124	10.50	(< 20)
1,1,2-Trichloroethane	5.20U	783	809	103	783	840	107	78-121	3.80	(< 20)
1,1-Dichloroethane	13.1U	783	860	110	783	777	99	76-125	10.20	(< 20)
1,1-Dichloroethene	13.1U	783	934	119	783	1180	151 *	70-131	23.30	* (< 20)
1,1-Dichloropropene	13.1U	783	832	106	783	811	104	76-125	2.60	(< 20)
1,2,3-Trichlorobenzene	26.1U	783	991	127	783	1250	159 *	66-130	22.80	* (< 20)
1,2,3-Trichloropropane	13.1U	783	741	95	783	839	107	73-125	12.40	(< 20)
1,2,4-Trichlorobenzene	13.1U	783	932	119	783	1180	151 *	67-129	23.60	* (< 20)
1,2,4-Trimethylbenzene	26.1U	783	795	102	783	897	115	75-123	12.00	(< 20)
1,2-Dibromo-3-chloropropane	52.0U	783	801	102	783	1040	132	61-132	25.60	* (< 20)
1,2-Dibromoethane	5.20U	783	858	110	783	848	108	78-122	1.20	(< 20)
1,2-Dichlorobenzene	13.1U	783	766	98	783	778	99	78-121	1.60	(< 20)
1,2-Dichloroethane	5.20U	783	760	97	783	804	103	73-128	5.60	(< 20)
1,2-Dichloropropane	5.20U	783	636	81	783	763	97	76-123	18.10	(< 20)
1,3,5-Trimethylbenzene	13.1U	783	803	103	783	894	114	73-124	10.70	(< 20)
1,3-Dichlorobenzene	13.1U	783	713	91	783	824	105	77-121	14.50	(< 20)
1,3-Dichloropropane	5.20U	783	831	106	783	841	107	77-121	1.20	(< 20)
1,4-Dichlorobenzene	13.1U	783	729	93	783	859	110	75-120	16.40	(< 20)
2,2-Dichloropropane	13.1U	783	793	101	783	805	103	67-133	1.60	(< 20)
2-Butanone (MEK)	131U	2350	2150	92	2350	2240	95	51-148	3.80	(< 20)
2-Chlorotoluene	13.1U	783	752	96	783	852	109	75-122	12.40	(< 20)
2-Hexanone	131U	2350	2230	95	2350	2350	100	53-145	5.40	(< 20)
4-Chlorotoluene	13.1U	783	747	95	783	1010	129 *	72-124	30.30	* (< 20)
4-Isopropyltoluene	13.1U	783	725	93	783	767	98	73-127	5.60	(< 20)
4-Methyl-2-pentanone (MIBK)	131U	2350	1600	68	2350	2280	97	65-135	35.20	* (< 20)
Benzene	6.55U	783	848	108	783	767	98	77-121	10.00	(< 20)
Bromobenzene	13.1U	783	753	96	783	922	118	78-121	20.20	* (< 20)
Bromochloromethane	13.1U	783	810	103	783	734	94	78-125	9.80	(< 20)
Bromodichloromethane	13.1U	783	692	88	783	855	109	75-127	21.00	* (< 20)
Bromoform	13.1U	783	889	114	783	905	116	67-132	1.80	(< 20)
Bromomethane	105U	783	839	107	783	1060	135	53-143	23.00	* (< 20)
Carbon disulfide	52.0U	1170	1370	117	1170	1750	149 *	63-132	24.50	* (< 20)
Carbon tetrachloride	6.55U	783	815	104	783	855	109	70-135	4.80	(< 20)
Chlorobenzene	13.1U	783	785	100	783	791	101	79-120	0.76	(< 20)
Chloroethane	105U	783	791	101	783	1020	130	59-139	25.30	* (< 20)

Print Date: 10/27/2015 2:44:36PM

Matrix Spike Summary

Original Sample ID: 1297782
MS Sample ID: 1297313 MS
MSD Sample ID: 1297314 MSD

Analysis Date: 10/12/2015 18:56
Analysis Date: 10/12/2015 17:20
Analysis Date: 10/12/2015 17:36
Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702018

Results by SW8260B

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Chloroform	13.1U	783	771	98	783	763	97	78-123	0.99	(< 20)
Chloromethane	13.1U	783	699	89	783	752	96	50-136	7.30	(< 20)
cis-1,2-Dichloroethene	13.1U	783	819	105	783	737	94	77-123	10.50	(< 20)
cis-1,3-Dichloropropene	13.1U	783	634	81	783	859	110	74-126	30.10	* (< 20)
Dibromochloromethane	13.1U	783	894	114	783	887	113	74-126	0.73	(< 20)
Dibromomethane	13.1U	783	630	80	783	790	101	78-125	22.50	* (< 20)
Dichlorodifluoromethane	26.1U	783	557	71	783	678	87	29-149	19.60	(< 20)
Ethylbenzene	13.1U	783	792	101	783	794	101	76-122	0.23	(< 20)
Freon-113	52.0U	1170	1310	112	1170	1680	143	* 66-136	24.40	* (< 20)
Hexachlorobutadiene	26.1U	783	1080	138	* 783	1150	147	* 61-135	6.50	(< 20)
Isopropylbenzene (Cumene)	13.1U	783	886	113	783	923	118	68-134	4.10	(< 20)
Methylene chloride	52.0U	783	888	113	783	1030	131	* 70-128	14.70	(< 20)
Methyl-t-butyl ether	52.0U	1170	1350	115	1170	1390	119	73-125	3.50	(< 20)
Naphthalene	26.1U	783	852	109	783	1210	154	* 62-129	34.60	* (< 20)
n-Butylbenzene	13.1U	783	823	105	783	897	115	70-128	8.60	(< 20)
n-Propylbenzene	13.1U	783	711	91	783	778	99	73-125	8.90	(< 20)
o-Xylene	13.1U	783	797	102	783	791	101	77-123	0.72	(< 20)
P & M -Xylene	26.1U	1570	1590	101	1570	1580	101	77-124	0.20	(< 20)
sec-Butylbenzene	13.1U	783	753	96	783	827	106	73-126	9.40	(< 20)
Styrene	13.1U	783	739	94	783	751	96	76-124	1.60	(< 20)
tert-Butylbenzene	13.1U	783	726	93	783	802	102	73-125	9.90	(< 20)
Tetrachloroethene	6.55U	783	798	102	783	798	102	73-128	0.03	(< 20)
Toluene	13.1U	783	793	101	783	800	102	77-121	0.89	(< 20)
trans-1,2-Dichloroethene	13.1U	783	904	115	783	1080	137	* 74-125	17.40	(< 20)
trans-1,3-Dichloropropene	13.1U	783	848	108	783	856	109	71-130	0.86	(< 20)
Trichloroethene	6.55U	783	766	98	783	836	107	77-123	8.80	(< 20)
Trichlorofluoromethane	26.1U	783	935	119	783	1010	129	62-140	7.30	(< 20)
Vinyl acetate	52.0U	783	896	114	783	826	105	50-151	8.20	(< 20)
Vinyl chloride	5.20U	783	858	110	783	898	115	56-135	4.60	(< 20)
Xylenes (total)	39.1U	2350	2380	101	2350	2380	101	78-124	0.37	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		783	774	99	783	811	104	71-136	4.60	
4-Bromofluorobenzene (surr)		2090	1660	79	2090	1730	83	55-151	4.10	
Toluene-d8 (surr)		783	838	107	783	845	108	85-116	0.84	

Print Date: 10/27/2015 2:44:36PM

Matrix Spike Summary

Original Sample ID: 1297782
MS Sample ID: 1297313 MS
MSD Sample ID: 1297314 MSD

QC for Samples: 1158702018

Analysis Date:
Analysis Date: 10/12/2015 17:20
Analysis Date: 10/12/2015 17:36
Matrix: Soil/Solid (dry weight)

Results by SW8260B

Parameter	Sample	Matrix Spike (%)			Spike Duplicate (%)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			

Batch Information

Analytical Batch: VMS15331
Analytical Method: SW8260B
Instrument: VQA 7890/5975 GC/MS
Analyst: ST
Analytical Date/Time: 10/12/2015 5:20:00PM

Prep Batch: VXX28064
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 10/12/2015 8:00:01AM
Prep Initial Wt./Vol.: 47.88g
Prep Extract Vol: 25.00mL

Print Date: 10/27/2015 2:44:36PM

Method Blank

Blank ID: MB for HBN 1722679 [VXX/28070]
Blank Lab ID: 1297611

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702018, 1158702019, 1158702020, 1158702021, 1158702022

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
1,4-Difluorobenzene (surr)	105	72-119		%
4-Bromofluorobenzene (surr)	99.3	50-150		%

Batch Information

Analytical Batch: VFC12744
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: CRD
Analytical Date/Time: 10/13/2015 9:29:00AM

Prep Batch: VXX28070
Prep Method: SW5035A
Prep Date/Time: 10/13/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:38PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28070]
 Blank Spike Lab ID: 1297612
 Date Analyzed: 10/13/2015 10:26

Spike Duplicate ID: LCSD for HBN 1158702
 [VXX28070]
 Spike Duplicate Lab ID: 1297613
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702018, 1158702019, 1158702020, 1158702021, 1158702022

Results by AK101

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	13.3	107	12.5	12.9	103	(60-120)	3.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	98.8	99	1.25	98.2	98	(50-150)	0.57	

Batch Information

Analytical Batch: **VFC12744**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890 PID/FID**
 Analyst: **CRD**

Prep Batch: **VXX28070**
 Prep Method: **SW5035A**
 Prep Date/Time: **10/13/2015 08:00**
 Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:40PM

Method Blank

Blank ID: MB for HBN 1722682 [VXX/28073]
Blank Lab ID: 1297622

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702013, 1158702014, 1158702015, 1158702016, 1158702017

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.768J	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	95.8	50-150		%

Batch Information

Analytical Batch: VFC12743
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 10/13/2015 9:32:00AM

Prep Batch: VXX28073
Prep Method: SW5035A
Prep Date/Time: 10/13/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:41PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28073]
 Blank Spike Lab ID: 1297625
 Date Analyzed: 10/13/2015 10:29

Spike Duplicate ID: LCSD for HBN 1158702 [VXX28073]
 Spike Duplicate Lab ID: 1297626
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702013, 1158702014, 1158702015, 1158702016, 1158702017

Results by AK101

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	13.0	104	12.5	13.0	104	(60-120)	0.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	98.7	99	1.25	98	98	(50-150)	0.67	

Batch Information

Analytical Batch: **VFC12743**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890A PID/FID**
 Analyst: **CRD**

Prep Batch: **VXX28073**
 Prep Method: **SW5035A**
 Prep Date/Time: **10/13/2015 08:00**
 Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:42PM

Method Blank

Blank ID: MB for HBN 1722682 [VXX/28073]
Blank Lab ID: 1297622

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702013, 1158702014, 1158702015, 1158702016, 1158702017

Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	17.8J	50.0	15.0	ug/Kg
Toluene	13.5J	25.0	7.80	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	96.9	72-119		%

Batch Information

Analytical Batch: VFC12743
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 10/13/2015 9:32:00AM

Prep Batch: VXX28073
Prep Method: SW5035A
Prep Date/Time: 10/13/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:44PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [VXX28073]
 Blank Spike Lab ID: 1297623
 Date Analyzed: 10/13/2015 09:51

Spike Duplicate ID: LCSD for HBN 1158702 [VXX28073]
 Spike Duplicate Lab ID: 1297624
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702013, 1158702014, 1158702015, 1158702016, 1158702017

Results by SW8021B

Parameter	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	1250	1470	117	1250	1490	120	(75-125)	1.80	(< 20)
Ethylbenzene	1250	1360	109	1250	1380	111	(75-125)	1.70	(< 20)
o-Xylene	1250	1320	106	1250	1340	107	(75-125)	1.60	(< 20)
P & M -Xylene	2500	2690	108	2500	2730	109	(80-125)	1.60	(< 20)
Toluene	1250	1440	115	1250	1470	117	(70-125)	1.70	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	100	100	1250	99.9	100	(72-119)	0.52	

Batch Information

Analytical Batch: VFC12743
 Analytical Method: SW8021B
 Instrument: Agilent 7890A PID/FID
 Analyst: CRD

Prep Batch: VXX28073
 Prep Method: SW5035A
 Prep Date/Time: 10/13/2015 08:00
 Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

Print Date: 10/27/2015 2:44:46PM

Matrix Spike Summary

Original Sample ID: 1155848001
MS Sample ID: 1297627 MS
MSD Sample ID: 1297628 MSD

Analysis Date: 10/13/2015 11:07
Analysis Date: 10/13/2015 11:26
Analysis Date: 10/13/2015 11:45
Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702013, 1158702014, 1158702015, 1158702016, 1158702017

Results by SW8021B

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	8.76J	799	941	117	799	956	119	75-125	1.60	(< 20)
Ethylbenzene	10.4U	799	865	108	799	877	110	75-125	1.40	(< 20)
o-Xylene	12.3J	799	845	104	799	854	105	75-125	1.00	(< 20)
P & M -Xylene	93.2	1603	1756	104	1603	1778	105	80-125	1.20	(< 20)
Toluene	83.2	799	926	106	799	940	107	70-125	1.40	(< 20)

Surrogates

1,4-Difluorobenzene (surr)	799	790	99	799	789	99	72-119	0.16
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Batch Information

Analytical Batch: VFC12743
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 10/13/2015 11:26:00AM

Prep Batch: VXX28073
Prep Method: AK101 Extraction (S)
Prep Date/Time: 10/13/2015 8:00:00AM
Prep Initial Wt./Vol.: 85.89g
Prep Extract Vol: 25.00mL

Print Date: 10/27/2015 2:44:47PM

Method Blank

Blank ID: MB for HBN 1722131 [XXX/34352]
Blank Lab ID: 1296089

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702021, 1158702022

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	80.6	60-120		%

Batch Information

Analytical Batch: XFC12141
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: KJO
Analytical Date/Time: 10/8/2015 7:21:00AM

Prep Batch: XXX34352
Prep Method: SW3550C
Prep Date/Time: 10/7/2015 5:40:40PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

Print Date: 10/27/2015 2:44:48PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [XXX34352]
 Blank Spike Lab ID: 1296090
 Date Analyzed: 10/08/2015 07:31

Spike Duplicate ID: LCSD for HBN 1158702 [XXX34352]
 Spike Duplicate Lab ID: 1296091
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702021, 1158702022

Results by AK102

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	167	150	90	167	152	91	(75-125)	1.60	(< 20)
Surrogates									
5a Androstane (surr)	3.33	98.7	99	3.33	101	101	(60-120)	2.60	

Batch Information

Analytical Batch: **XFC12141**
 Analytical Method: **AK102**
 Instrument: **HP 6890 Series II FID SV D R**
 Analyst: **KJO**

Prep Batch: **XXX34352**
 Prep Method: **SW3550C**
 Prep Date/Time: **10/07/2015 17:40**
 Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

Print Date: 10/27/2015 2:44:50PM

Method Blank

Blank ID: MB for HBN 1722133 [XXX/34353]
Blank Lab ID: 1296096

Matrix: Soil/Solid (dry weight)

QC for Samples:

1158702001, 1158702002, 1158702003, 1158702004, 1158702005, 1158702006, 1158702007, 1158702008, 1158702009, 1158702010, 1158702011, 1158702012, 1158702013, 1158702014, 1158702015, 1158702016, 1158702017, 1158702018, 1158702019, 1158702020

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	92.8	60-120		%

Batch Information

Analytical Batch: XFC12141
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: NLL
Analytical Date/Time: 10/8/2015 11:15:00PM

Prep Batch: XXX34353
Prep Method: SW3550C
Prep Date/Time: 10/7/2015 9:29:13PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

Print Date: 10/27/2015 2:44:51PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [XXX34353]
 Blank Spike Lab ID: 1296097
 Date Analyzed: 10/08/2015 23:25

Spike Duplicate ID: LCSD for HBN 1158702 [XXX34353]
 Spike Duplicate Lab ID: 1296098
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702001, 1158702002, 1158702003, 1158702004, 1158702005, 1158702006, 1158702007, 1158702008, 1158702009, 1158702010, 1158702011, 1158702012, 1158702013, 1158702014, 1158702015, 1158702016, 1158702017, 1158702018, 1158702019, 1158702020

Results by AK102

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	167	140	84	167	145	87	(75-125)	3.50	(< 20)
Surrogates									
5a Androstane (surr)	3.33	92.6	93	3.33	97.4	97	(60-120)	5.10	

Batch Information

Analytical Batch: **XFC12141**
 Analytical Method: **AK102**
 Instrument: **HP 6890 Series II FID SV D R**
 Analyst: **NLL**

Prep Batch: **XXX34353**
 Prep Method: **SW3550C**
 Prep Date/Time: **10/07/2015 21:29**
 Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

Print Date: 10/27/2015 2:44:52PM

Method Blank

Blank ID: MB for HBN 1722209 [XXX/34360]
Blank Lab ID: 1296248

Matrix: Soil/Solid (dry weight)

QC for Samples:
1158702002, 1158702004, 1158702005

Results by 8270D SIMS (PAH)

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	2.02J	5.00	1.50	ug/Kg
2-Methylnaphthalene	2.31J	5.00	1.50	ug/Kg
Acenaphthene	2.50U	5.00	1.50	ug/Kg
Acenaphthylene	2.50U	5.00	1.50	ug/Kg
Anthracene	2.50U	5.00	1.50	ug/Kg
Benzo(a)Anthracene	2.50U	5.00	1.50	ug/Kg
Benzo[a]pyrene	2.50U	5.00	1.50	ug/Kg
Benzo[b]Fluoranthene	2.50U	5.00	1.50	ug/Kg
Benzo[g,h,i]perylene	2.50U	5.00	1.50	ug/Kg
Benzo[k]fluoranthene	2.50U	5.00	1.50	ug/Kg
Chrysene	2.50U	5.00	1.50	ug/Kg
Dibenzo[a,h]anthracene	2.50U	5.00	1.50	ug/Kg
Fluoranthene	2.50U	5.00	1.50	ug/Kg
Fluorene	2.50U	5.00	1.50	ug/Kg
Indeno[1,2,3-c,d] pyrene	2.50U	5.00	1.50	ug/Kg
Naphthalene	2.50U	5.00	1.50	ug/Kg
Phenanthrene	2.50U	5.00	1.50	ug/Kg
Pyrene	2.50U	5.00	1.50	ug/Kg

Surrogates

2-Fluorobiphenyl (surr)	79.2	46-115	%
Terphenyl-d14 (surr)	95.8	58-113	%

Batch Information

Analytical Batch: XMS8982
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: NRB
Analytical Date/Time: 10/14/2015 2:10:00PM

Prep Batch: XXX34360
Prep Method: SW3550C
Prep Date/Time: 10/8/2015 12:59:54PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1158702 [XXX34360]
 Blank Spike Lab ID: 1296249
 Date Analyzed: 10/14/2015 14:25

Spike Duplicate ID: LCSD for HBN 1158702
 [XXX34360]
 Spike Duplicate Lab ID: 1296250
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702002, 1158702004, 1158702005

Results by 8270D SIMS (PAH)

Parameter	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	22.2	17.8	80	22.2	17.7	80	(43-111)	0.93	(< 20)
2-Methylnaphthalene	22.2	17.5	79	22.2	17.1	77	(39-114)	2.40	(< 20)
Acenaphthene	22.2	15.7	71	22.2	17.3	78	(44-111)	9.70	(< 20)
Acenaphthylene	22.2	15.8	71	22.2	16.8	76	(39-116)	6.30	(< 20)
Anthracene	22.2	15.0	67	22.2	15.1	68	(50-114)	0.72	(< 20)
Benzo(a)Anthracene	22.2	20.4	92	22.2	20.6	93	(54-122)	1.00	(< 20)
Benzo[a]pyrene	22.2	15.5	70	22.2	15.5	70	(50-125)	0.21	(< 20)
Benzo[b]Fluoranthene	22.2	21.2	95	22.2	20.7	93	(53-128)	2.30	(< 20)
Benzo[g,h,i]perylene	22.2	19.8	89	22.2	19.3	87	(49-127)	2.60	(< 20)
Benzo[k]fluoranthene	22.2	18.6	84	22.2	18.5	83	(56-123)	0.75	(< 20)
Chrysene	22.2	20.0	90	22.2	20.6	93	(57-118)	3.10	(< 20)
Dibenzo[a,h]anthracene	22.2	21.1	95	22.2	20.3	91	(50-129)	4.00	(< 20)
Fluoranthene	22.2	19.1	86	22.2	19.5	88	(55-119)	2.50	(< 20)
Fluorene	22.2	17.3	78	22.2	18.1	81	(47-114)	4.20	(< 20)
Indeno[1,2,3-c,d] pyrene	22.2	19.9	89	22.2	19.5	88	(49-130)	1.70	(< 20)
Naphthalene	22.2	14.8	67	22.2	15.4	69	(38-111)	4.30	(< 20)
Phenanthrene	22.2	19.6	88	22.2	20.0	90	(49-113)	2.20	(< 20)
Pyrene	22.2	18.5	83	22.2	19.0	85	(55-117)	2.50	(< 20)
Surrogates									
2-Fluorobiphenyl (surr)	22.2	74.4	74	22.2	78.2	78	(46-115)	5.00	
Terphenyl-d14 (surr)	22.2	91.5	92	22.2	96.1	96	(58-113)	4.90	

Batch Information

Analytical Batch: XMS8982
 Analytical Method: 8270D SIMS (PAH)
 Instrument: HP 6890/5973 MS SVQA
 Analyst: NRB

Prep Batch: XXX34360
 Prep Method: SW3550C
 Prep Date/Time: 10/08/2015 12:59
 Spike Init Wt./Vol.: 22.2 ug/Kg Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 22.2 ug/Kg Extract Vol: 1 mL

Print Date: 10/27/2015 2:44:55PM

Matrix Spike Summary

Original Sample ID: 1300435
MS Sample ID: 1296251 MS
MSD Sample ID: 1296252 MSD

Analysis Date: 10/26/2015 4:08
Analysis Date: 10/26/2015 4:24
Analysis Date: 10/26/2015 4:40
Matrix: Soil/Solid (dry weight)

QC for Samples: 1158702002, 1158702004, 1158702005

Results by 8270D SIMS (PAH)

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	14.3	22.2	23.6	42 *	21.8	28.4	65	43-111	18.40	(< 20)
2-Methylnaphthalene	22.2	22.2	29.1	31 *	21.8	34.6	57	39-114	17.40	(< 20)
Acenaphthene	2.48U	22.2	13.8	62	21.8	14.6	67	44-111	5.80	(< 20)
Acenaphthylene	2.48U	22.2	14.3	64	21.8	14.8	68	39-116	3.60	(< 20)
Anthracene	2.48U	22.2	16.1	73	21.8	16.0	73	50-114	0.54	(< 20)
Benzo(a)Anthracene	2.48U	22.2	16.6	75	21.8	16.4	75	54-122	0.97	(< 20)
Benzo(a)pyrene	2.48U	22.2	14.7	67	21.8	14.8	68	50-125	0.13	(< 20)
Benzo(b)Fluoranthene	2.48U	22.2	14.8	67	21.8	14.8	68	53-128	0.17	(< 20)
Benzo(g,h,i)perylene	2.48U	22.2	13.6	61	21.8	13.3	61	49-127	2.10	(< 20)
Benzo(k)fluoranthene	2.48U	22.2	16.8	76	21.8	15.8	72	56-123	6.30	(< 20)
Chrysene	2.48U	22.2	17.4	78	21.8	16.9	77	57-118	3.00	(< 20)
Dibenzo(a,h)anthracene	2.48U	22.2	14.8	67	21.8	13.9	64	50-129	6.00	(< 20)
Fluoranthene	2.48U	22.2	17.3	78	21.8	17.3	79	55-119	0.07	(< 20)
Fluorene	1.96J	22.2	16.3	65	21.8	16.7	67	47-114	2.00	(< 20)
Indeno[1,2,3-c,d] pyrene	2.48U	22.2	14.1	64	21.8	13.4	61	49-130	5.20	(< 20)
Naphthalene	5.20	22.2	17.2	54	21.8	17.5	56	38-111	1.60	(< 20)
Phenanthrene	2.48U	22.2	17.3	78	21.8	17.3	79	49-113	0.32	(< 20)
Pyrene	2.48U	22.2	16.5	75	21.8	16.9	77	55-117	2.10	(< 20)
Surrogates										
2-Fluorobiphenyl (surr)		22.2	14.6	66	21.8	15.3	70	46-115	4.30	
Terphenyl-d14 (surr)		22.2	19.9	90	21.8	19.5	89	58-113	2.10	

Batch Information

Analytical Batch: XMS9008
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: NRB
Analytical Date/Time: 10/26/2015 4:24:00AM

Prep Batch: XXX34360
Prep Method: Sonication Extraction Soil 8270 PAH SIM
Prep Date/Time: 10/8/2015 12:59:54PM
Prep Initial Wt./Vol.: 22.54g
Prep Extract Vol: 1.00mL

Print Date: 10/27/2015 2:44:56PM



CLIENT: Alutra Engineering Services										INSTRUCTIONS: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.										Page 1 of 3																													
CONTACT: Andrew Weller										PHONE NO:										Preservative																													
PROJECT PWSID/ NAME: Ruby PACP										PERMIT#: 20266.014																																							
REPORTS TO: Rodney Gurnitz										E-MAIL: rodney@arcticdata.com																																							
INVOICE TO: Alutra Engineering Svcs.										QUOTE #: P.O. #:																																							
RESERVED for lab use										SAMPLE IDENTIFICATION										DATE										TIME										MATRIX/MATRIX CODE									
1A-B										15-RBY-TP-01-10										09/28/15										1410										Sorl									
2A-B										15-RBY-TP-01-3										09/28/15										1425																			
3A-B										15-RBY-TP-02-9.5										09/28/15										1540																			
4A-B										15-RBY-TP-02-4										09/28/15										1605																			
5A-B										15-RBY-TP-12-4										09/28/15										1615																			
6A-B										15-RBY-SB-01-4										09/29/15										0935																			
7A-B										15-RBY-SB-02-4																				0947																			
8A-B										15-RBY-SB-04-4																				1007																			
9A-B										15-RBY-SB-06-4																				1041																			
10A-B										15-RBY-SB-07-4																				1053																			
Relinquished By: (1)										Date										Time										Received By:										10-2-15									
Rodney Gurnitz										10/2/15										0930										[Signature]										930									
Relinquished By: (2)										Date										Time										Received By:																			
[Signature]										10-2-15										1400										[Signature]																			
Relinquished By: (3)										Date										Time										Received By:																			
[Signature]																																																	
Relinquished By: (4)										Date										Time										Received For Laboratory By:																			
[Signature]										10/03/15										951										D. Chua																			

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

[illegible]

<http://www.sgs.com/terms-and-conditions>

F083-Kit_Request_and_COC_Templates-Blank
Revised 2013-03-24



Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.					
CLIENT: see pg. 1		PHONE NO:		Section 3	
CONTACT:		PROJECT / PWSID / PERMIT#:		Preservative	
REPORTS TO:		E-MAIL:			
INVOICE TO:		QUOTE #:			
P.O. #:					
RESERVED for lab use		SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE
(21) A-B	15-RBY-CS-24-1	09/30/15	0840	Soil	
(22) A-B	15-RBY-CS-26-1	✓	0845	↓	
(23) A	Trip Blank A	-	-	↓	
(24) A	Trip Blank B	-	-	↓	
Section 2					
Relinquished By: (1) Rodriguez-Diaz					
Relinquished By: (2)					
Relinquished By: (3)					
Relinquished By: (4)					
Section 5					
Received By: 10/2/15 0930					
Received By: 10-2-15 1400					
Received By:					
Received For Laboratory By: D. Cuda					
Date 10/03/15 957					
Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT					
Temp Blank °C: 0.9 or Ambient []					
(See attached Sample Receipt Form)					

1158702



FAIRBANKS SAMPLE RECEIPT FORM

Note: This form is to be completed by Fairbanks Receiving Staff for all samples

[illegible]



1 1 5 8 7 0 2

[illegible]

Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1158702001-A	No Preservative Required	OK	1158702022-A	No Preservative Required	OK
1158702001-B	Methanol field pres. 4 C	OK	1158702022-B	Methanol field pres. 4 C	OK
1158702002-A	No Preservative Required	OK	1158702023-A	Methanol field pres. 4 C	OK
1158702002-B	Methanol field pres. 4 C	OK	1158702024-A	Methanol field pres. 4 C	OK
1158702003-A	No Preservative Required	OK			
1158702003-B	Methanol field pres. 4 C	OK			
1158702004-A	No Preservative Required	OK			
1158702004-B	Methanol field pres. 4 C	OK			
1158702005-A	No Preservative Required	OK			
1158702005-B	Methanol field pres. 4 C	OK			
1158702006-A	No Preservative Required	OK			
1158702006-B	Methanol field pres. 4 C	OK			
1158702007-A	No Preservative Required	OK			
1158702007-B	Methanol field pres. 4 C	OK			
1158702008-A	No Preservative Required	OK			
1158702008-B	Methanol field pres. 4 C	OK			
1158702009-A	No Preservative Required	OK			
1158702009-B	Methanol field pres. 4 C	OK			
1158702010-A	No Preservative Required	OK			
1158702010-B	Methanol field pres. 4 C	OK			
1158702011-A	No Preservative Required	OK			
1158702011-B	Methanol field pres. 4 C	OK			
1158702012-A	No Preservative Required	OK			
1158702012-B	Methanol field pres. 4 C	OK			
1158702013-A	No Preservative Required	OK			
1158702013-B	Methanol field pres. 4 C	OK			
1158702014-A	No Preservative Required	OK			
1158702014-B	Methanol field pres. 4 C	OK			
1158702015-A	No Preservative Required	OK			
1158702015-B	Methanol field pres. 4 C	OK			
1158702016-A	No Preservative Required	OK			
1158702016-B	Methanol field pres. 4 C	OK			
1158702017-A	No Preservative Required	OK			
1158702017-B	Methanol field pres. 4 C	OK			
1158702018-A	No Preservative Required	OK			
1158702018-B	Methanol field pres. 4 C	OK			
1158702019-A	No Preservative Required	OK			
1158702019-B	Methanol field pres. 4 C	OK			
1158702020-A	No Preservative Required	OK			
1158702020-B	Methanol field pres. 4 C	OK			
1158702021-A	No Preservative Required	OK			
1158702021-B	Methanol field pres. 4 C	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

BU - The container was received with headspace greater than 6mm.

Laboratory Data Review Checklist for Air Samples

Completed by:	Rodney Guritz
Title:	Chemist
Date:	April 4, 2016
CS Report Name:	Ruby Former Headstart PACP
Report Date:	April 2016
Consultant Firm:	Arctic Data Services, LLC
Laboratory Name:	Eurofins Air Toxics, Folsom
Laboratory Report Number:	1603302
ADEC File Number:	870.38.004
ADEC Hazard ID:	

1. Laboratory

- a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

--

- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No samples were transferred to another laboratory.
--

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

--

b. Correct analyses requested?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

3. Laboratory Sample Receipt Documentation

a. Sample condition documented–Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

b. If there were any discrepancies, were they documented? For example, incorrect sample containers, sample holding times outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

☐ Yes ☐ No ☒ NA (Please explain.)

Comments:

There were no sample-receiving discrepancies.

c. Data quality or usability affected? Explain.

Comments:

Samples were received in good condition; data quality and usability were not affected.

4. Case Narrative

a. Present and understandable?

☐ ☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

b. Discrepancies, errors or QC failures identified by the lab?

☐ Yes ☐ No ☒ NA (Please explain.)

Comments:

The laboratory noted no discrepancies or QC anomalies.

c. Were all corrective actions documented?

☐ Yes ☐ No ☒ NA (Please explain.)

Comments:

There were no corrective actions performed.

d. What is the effect on data quality/usability according to the case narrative?

The case narrative does not indicate an effect on data quality or usability.

Comments:

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

b. Samples analyzed within 30 days of collection or within the time required by the method?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

c. Is the data reported in micrograms per meter cube volume ($\mu\text{g}/\text{m}^3$)?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

d. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Reported PQLs for non-detect results were below the relevant ADEC target levels for commercial indoor air.

e. Data quality or usability affected? Explain.

Comments:

Data quality and usability were not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. All method blank results less than PQL?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

No analytes were detected in the method blank.

iii. If above PQL, what samples are affected?

Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

v. Data quality or usability affected? Please Explain.

Comments:

Data quality and usability were not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

☐ Yes ☒ No ☐ NA (Please explain.) Comments:

Hexane was recovered above laboratory control limits in the CCV, LCS, and LCSD associated with project samples.

iii. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Hexane was not detected in any project samples, so results were not affected by the high bias.

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No sample results were affected (see above).

vi. Data quality or usability affected? Explain.

Comments:

Data quality and usability were not affected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – QC and laboratory samples?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits?
And project specified DQOs, if applicable.

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

There were no surrogate recovery failures.

iv. Data quality or usability affected? Explain.

Comments:

Data quality and usability were not affected.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 soil gas or indoor air samples?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Field-duplicate pair Main_hall_A/Main_hall_B was submitted in this work order.

ii. Submitted blind to lab?

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

- iii. Precision – All relative percent differences (RPD) less than specified DQOs?
(Recommended: 25 %)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

☐ ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

- iv. Data quality or usability affected? Explain.

Comments:

Data quality and usability were not affected.

7. Other Data Flags/Qualifiers

- a. Defined and appropriate?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No other flags were used by the laboratory.

3/29/2016
Mr. Andrew Weller
AHTNA
1896 Marika Rd
Suite 8
Fairbanks AK 99709

Project Name: Ruby PACP
Project #:
Workorder #: 1603302

Dear Mr. Andrew Weller

The following report includes the data for the above referenced project for sample(s) received on 3/16/2016 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-17 VI are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner
Project Manager

WORK ORDER #: 1603302

Work Order Summary

CLIENT:	Mr. Andrew Weller AHTNA 1896 Marika Rd Suite 8 Fairbanks, AK 99709	BILL TO:	Accounts Payable AHTNA 110 West 38th Ave Suite 200A Anchorage, AK 99503
PHONE:	907-374-4750	P.O. #	20266.014.01
FAX:		PROJECT #	Ruby PACP
DATE RECEIVED:	03/16/2016	CONTACT:	Kelly Buettner
DATE COMPLETED:	03/29/2016		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
01A	Furnace_Rm	Modified TO-17 VI
02A	Main_hall_A	Modified TO-17 VI
03A	Main_hall_B	Modified TO-17 VI
04A	Crawlspace_SW	Modified TO-17 VI
05A	Crawlspace_NE	Modified TO-17 VI
06A	Outdoor_air	Modified TO-17 VI
07A	Trip Blank	Modified TO-17 VI
08A	Lab Blank	Modified TO-17 VI
09A	CCV	Modified TO-17 VI
10A	LCS	Modified TO-17 VI
10AA	LCSD	Modified TO-17 VI

CERTIFIED BY:



Technical Director

DATE: 03/29/16

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704434-15-9, UT NELAP CA0093332015-6, VA NELAP - 8113, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2015, Expiration date: 10/17/2016.

Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, Inc.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified EPA Method TO-17 (VI Tubes)
AHTNA
Workorder# 1603302

Seven TO-17 VI Tube samples were received on March 16, 2016. The laboratory performed the analysis via modified EPA Method TO-17 using GC/MS in the full scan mode. TO-17 'VI' sorbent tubes are thermally desorbed onto a secondary trap. The trap is thermally desorbed to elute the components into the GC/MS system for compound separation and detection.

A modification that may be applied to EPA Method TO-17 at the client's discretion is the requirement to transport sorbent tubes at 4 deg C. Laboratory studies demonstrate a high level of stability for VOCs on the TO-17 'VI' tube at room temperature for periods of up to 14 days. Tubes can be shipped to and from the field site at ambient conditions as long as the 14-day sample hold time is upheld. Trip blanks and field surrogate spikes are used as additional control measures to monitor recovery and background contribution during tube transport.

Since the TO-17 VI application significantly extends the scope of target compounds addressed in EPA Method TO-15 and TO-17, the laboratory has implemented several method modifications outlined in the table below. Specific project requirements may over-ride the laboratory modifications.

Requirement	TO-17	ATL Modifications
Initial Calibration	%RSD<=30% with 2 allowed out up to 40%	VOC list: %RSD<=30% with 2 allowed out up to 40% SVOC list: %RSD<=30% with 2 allowed out up to 40%
Daily Calibration	%D for each target compound within +/-30%.	Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene within +/-40%D
Audit Accuracy	70-130%	Second source recovery limits for Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene = 60-140%.
Distributed Volume Pairs	Collection of distributed volume pairs required for monitoring ambient air to insure high quality.	If site is well-characterized or performance previously verified, single tube sampling may be appropriate. Distributed pairs may be impractical for soil gas collection due to configuration and volume constraints.
Analytical Precision	<=20% RPD	<30% RPD for Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

A sampling volume of 5.00 L was used to convert ng to ug/m³ for the associated Lab Blank and sample Trip Blank.

The reported CCV and LCS for each daily batch may be derived from more than one analytical file due to the client's request for non-standard compounds.

A 3-point initial calibration was performed for n-butylbenzene, sec-butylbenzene, and

tert-Butylbenzene. The reporting limits were established by the lowest calibration level of the curve.

All Quality Control Limit exceedances and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

- B - Compound present in blank (subtraction not performed).

- J - Estimated value.

- E - Exceeds instrument calibration range.

- S - Saturated peak.

- Q - Exceeds quality control limits.

- U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

- UJ- Non-detected compound associated with low bias in the CCV

- N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified

- b-File was quantified by a second column and detector

- r1-File was requantified for the purpose of reissue

Summary of Detected Compounds EPA METHOD TO-17

Client Sample ID: Furnace_Rm

Lab ID#: 1603302-01A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Benzene	6.4	1.3	9.6	1.9
Toluene	7.5	1.5	23	4.6
m,p-Xylene	8.7	1.7	15	3.0
Naphthalene	1.0	0.20	3.0	0.59
2-Methylnaphthalene	1.0	0.20	1.6	0.33
1-Methylnaphthalene	1.0	0.20	1.3	0.26

Client Sample ID: Main_hall_A

Lab ID#: 1603302-02A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Benzene	6.4	1.3	8.1	1.6
Toluene	7.5	1.5	26	5.2
Ethyl Benzene	4.3	0.86	4.5	0.91
m,p-Xylene	8.7	1.7	16	3.3
Naphthalene	1.0	0.20	2.5	0.50
2-Methylnaphthalene	1.0	0.20	1.1	0.22

Client Sample ID: Main_hall_B

Lab ID#: 1603302-03A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Benzene	6.4	1.3	8.8	1.8
Toluene	7.5	1.5	26	5.2
Ethyl Benzene	4.3	0.86	4.5	0.90
m,p-Xylene	8.7	1.7	16	3.1
Naphthalene	1.0	0.20	2.4	0.48
2-Methylnaphthalene	1.0	0.20	1.1	0.21

Client Sample ID: Crawlspace_SW

Lab ID#: 1603302-04A

Summary of Detected Compounds EPA METHOD TO-17

Client Sample ID: Crawlspace_SW

Lab ID#: 1603302-04A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Benzene	6.4	1.3	6.7	1.3
Toluene	7.5	1.5	12	2.5

Client Sample ID: Crawlspace_NE

Lab ID#: 1603302-05A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Benzene	6.4	1.3	7.8	1.6
Toluene	7.5	1.5	12	2.4
Naphthalene	1.0	0.20	1.2	0.25

Client Sample ID: Outdoor_air

Lab ID#: 1603302-06A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Benzene	6.4	1.3	6.4	1.3
Toluene	7.5	1.5	14	2.9
m,p-Xylene	8.7	1.7	9.2	1.8

Client Sample ID: Trip Blank

Lab ID#: 1603302-07A

No Detections Were Found.

Client Sample ID: Furnace_Rm

Lab ID#: 1603302-01A

EPA METHOD TO-17

File Name:	18031815	Date of Extraction: NA	Date of Collection: 3/12/16 1:00:00 PM
Dil. Factor:	1.00	Date of Analysis: 3/18/16 07:44 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Hexane	35	7.0	Not Detected	Not Detected
Benzene	6.4	1.3	9.6	1.9
Cyclohexane	6.9	1.4	Not Detected	Not Detected
Toluene	7.5	1.5	23	4.6
Ethyl Benzene	4.3	0.86	Not Detected	Not Detected
m,p-Xylene	8.7	1.7	15	3.0
o-Xylene	8.7	1.7	Not Detected	Not Detected
Styrene	8.5	1.7	Not Detected	Not Detected
Cumene	9.8	2.0	Not Detected	Not Detected
Propylbenzene	9.8	2.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	9.8	2.0	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	5.8	Not Detected	Not Detected
Naphthalene	1.0	0.20	3.0	0.59
2-Methylnaphthalene	1.0	0.20	1.6	0.33
1-Methylnaphthalene	1.0	0.20	1.3	0.26
Acenaphthene	5.0	1.0	Not Detected	Not Detected
Fluorene	5.0	1.0	Not Detected	Not Detected
Anthracene	5.0	1.0	Not Detected	Not Detected
Butylbenzene	10	2.0	Not Detected	Not Detected
sec-Butylbenzene	10	2.0	Not Detected	Not Detected
tert-Butylbenzene	10	2.0	Not Detected	Not Detected

Air Sample Volume(L): 5.00

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	88	50-150
Toluene-d8	87	50-150
Naphthalene-d8	90	50-150



Air Toxics

Client Sample ID: Main_hall_A

Lab ID#: 1603302-02A

EPA METHOD TO-17

File Name:	18031816	Date of Extraction: NA	Date of Collection: 3/12/16 1:00:00 PM
Dil. Factor:	1.00	Date of Analysis: 3/18/16 08:54 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Hexane	35	7.0	Not Detected	Not Detected
Benzene	6.4	1.3	8.1	1.6
Cyclohexane	6.9	1.4	Not Detected	Not Detected
Toluene	7.5	1.5	26	5.2
Ethyl Benzene	4.3	0.86	4.5	0.91
m,p-Xylene	8.7	1.7	16	3.3
o-Xylene	8.7	1.7	Not Detected	Not Detected
Styrene	8.5	1.7	Not Detected	Not Detected
Cumene	9.8	2.0	Not Detected	Not Detected
Propylbenzene	9.8	2.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	9.8	2.0	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	5.8	Not Detected	Not Detected
Naphthalene	1.0	0.20	2.5	0.50
2-Methylnaphthalene	1.0	0.20	1.1	0.22
1-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
Acenaphthene	5.0	1.0	Not Detected	Not Detected
Fluorene	5.0	1.0	Not Detected	Not Detected
Anthracene	5.0	1.0	Not Detected	Not Detected
Butylbenzene	10	2.0	Not Detected	Not Detected
sec-Butylbenzene	10	2.0	Not Detected	Not Detected
tert-Butylbenzene	10	2.0	Not Detected	Not Detected

Air Sample Volume(L): 5.00

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	50-150
Toluene-d8	90	50-150
Naphthalene-d8	93	50-150



Air Toxics

Client Sample ID: Main_hall_B

Lab ID#: 1603302-03A

EPA METHOD TO-17

File Name:	18031817	Date of Extraction: NA	Date of Collection: 3/12/16 1:00:00 PM
Dil. Factor:	1.00	Date of Analysis: 3/18/16 10:06 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Hexane	35	7.0	Not Detected	Not Detected
Benzene	6.4	1.3	8.8	1.8
Cyclohexane	6.9	1.4	Not Detected	Not Detected
Toluene	7.5	1.5	26	5.2
Ethyl Benzene	4.3	0.86	4.5	0.90
m,p-Xylene	8.7	1.7	16	3.1
o-Xylene	8.7	1.7	Not Detected	Not Detected
Styrene	8.5	1.7	Not Detected	Not Detected
Cumene	9.8	2.0	Not Detected	Not Detected
Propylbenzene	9.8	2.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	9.8	2.0	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	5.8	Not Detected	Not Detected
Naphthalene	1.0	0.20	2.4	0.48
2-Methylnaphthalene	1.0	0.20	1.1	0.21
1-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
Acenaphthene	5.0	1.0	Not Detected	Not Detected
Fluorene	5.0	1.0	Not Detected	Not Detected
Anthracene	5.0	1.0	Not Detected	Not Detected
Butylbenzene	10	2.0	Not Detected	Not Detected
sec-Butylbenzene	10	2.0	Not Detected	Not Detected
tert-Butylbenzene	10	2.0	Not Detected	Not Detected

Air Sample Volume(L): 5.00

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	50-150
Toluene-d8	89	50-150
Naphthalene-d8	81	50-150



Air Toxics

Client Sample ID: Crawlspace_SW

Lab ID#: 1603302-04A

EPA METHOD TO-17

File Name:	18031818	Date of Extraction: NA	Date of Collection: 3/12/16 1:00:00 PM
Dil. Factor:	1.00	Date of Analysis: 3/18/16 11:17 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Hexane	35	7.0	Not Detected	Not Detected
Benzene	6.4	1.3	6.7	1.3
Cyclohexane	6.9	1.4	Not Detected	Not Detected
Toluene	7.5	1.5	12	2.5
Ethyl Benzene	4.3	0.86	Not Detected	Not Detected
m,p-Xylene	8.7	1.7	Not Detected	Not Detected
o-Xylene	8.7	1.7	Not Detected	Not Detected
Styrene	8.5	1.7	Not Detected	Not Detected
Cumene	9.8	2.0	Not Detected	Not Detected
Propylbenzene	9.8	2.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	9.8	2.0	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	5.8	Not Detected	Not Detected
Naphthalene	1.0	0.20	Not Detected	Not Detected
2-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
1-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
Acenaphthene	5.0	1.0	Not Detected	Not Detected
Fluorene	5.0	1.0	Not Detected	Not Detected
Anthracene	5.0	1.0	Not Detected	Not Detected
Butylbenzene	10	2.0	Not Detected	Not Detected
sec-Butylbenzene	10	2.0	Not Detected	Not Detected
tert-Butylbenzene	10	2.0	Not Detected	Not Detected

Air Sample Volume(L): 5.00

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	50-150
Toluene-d8	90	50-150
Naphthalene-d8	90	50-150

Client Sample ID: Crawlspace_NE

Lab ID#: 1603302-05A

EPA METHOD TO-17

File Name:	18031819	Date of Extraction: NA	Date of Collection: 3/12/16 1:00:00 PM
Dil. Factor:	1.00	Date of Analysis: 3/19/16 12:28 AM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Hexane	35	7.0	Not Detected	Not Detected
Benzene	6.4	1.3	7.8	1.6
Cyclohexane	6.9	1.4	Not Detected	Not Detected
Toluene	7.5	1.5	12	2.4
Ethyl Benzene	4.3	0.86	Not Detected	Not Detected
m,p-Xylene	8.7	1.7	Not Detected	Not Detected
o-Xylene	8.7	1.7	Not Detected	Not Detected
Styrene	8.5	1.7	Not Detected	Not Detected
Cumene	9.8	2.0	Not Detected	Not Detected
Propylbenzene	9.8	2.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	9.8	2.0	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	5.8	Not Detected	Not Detected
Naphthalene	1.0	0.20	1.2	0.25
2-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
1-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
Acenaphthene	5.0	1.0	Not Detected	Not Detected
Fluorene	5.0	1.0	Not Detected	Not Detected
Anthracene	5.0	1.0	Not Detected	Not Detected
Butylbenzene	10	2.0	Not Detected	Not Detected
sec-Butylbenzene	10	2.0	Not Detected	Not Detected
tert-Butylbenzene	10	2.0	Not Detected	Not Detected

Air Sample Volume(L): 5.00

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	50-150
Toluene-d8	93	50-150
Naphthalene-d8	91	50-150

Client Sample ID: Outdoor_air

Lab ID#: 1603302-06A

EPA METHOD TO-17

File Name:	18031820	Date of Extraction: NA	Date of Collection: 3/12/16 1:00:00 PM
Dil. Factor:	1.00	Date of Analysis: 3/19/16 01:40 AM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Hexane	35	7.0	Not Detected	Not Detected
Benzene	6.4	1.3	6.4	1.3
Cyclohexane	6.9	1.4	Not Detected	Not Detected
Toluene	7.5	1.5	14	2.9
Ethyl Benzene	4.3	0.86	Not Detected	Not Detected
m,p-Xylene	8.7	1.7	9.2	1.8
o-Xylene	8.7	1.7	Not Detected	Not Detected
Styrene	8.5	1.7	Not Detected	Not Detected
Cumene	9.8	2.0	Not Detected	Not Detected
Propylbenzene	9.8	2.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	9.8	2.0	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	5.8	Not Detected	Not Detected
Naphthalene	1.0	0.20	Not Detected	Not Detected
2-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
1-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
Acenaphthene	5.0	1.0	Not Detected	Not Detected
Fluorene	5.0	1.0	Not Detected	Not Detected
Anthracene	5.0	1.0	Not Detected	Not Detected
Butylbenzene	10	2.0	Not Detected	Not Detected
sec-Butylbenzene	10	2.0	Not Detected	Not Detected
tert-Butylbenzene	10	2.0	Not Detected	Not Detected

Air Sample Volume(L): 5.00

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	50-150
Toluene-d8	90	50-150
Naphthalene-d8	84	50-150

Client Sample ID: Trip Blank

Lab ID#: 1603302-07A

EPA METHOD TO-17

File Name:	18031814	Date of Extraction: NA	Date of Collection: 3/12/16 1:00:00 PM
Dil. Factor:	1.00	Date of Analysis: 3/18/16 06:33 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Hexane	35	7.0	Not Detected	Not Detected
Benzene	6.4	1.3	Not Detected	Not Detected
Cyclohexane	6.9	1.4	Not Detected	Not Detected
Toluene	7.5	1.5	Not Detected	Not Detected
Ethyl Benzene	4.3	0.86	Not Detected	Not Detected
m,p-Xylene	8.7	1.7	Not Detected	Not Detected
o-Xylene	8.7	1.7	Not Detected	Not Detected
Styrene	8.5	1.7	Not Detected	Not Detected
Cumene	9.8	2.0	Not Detected	Not Detected
Propylbenzene	9.8	2.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	9.8	2.0	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	5.8	Not Detected	Not Detected
Naphthalene	1.0	0.20	Not Detected	Not Detected
2-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
1-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
Acenaphthene	5.0	1.0	Not Detected	Not Detected
Fluorene	5.0	1.0	Not Detected	Not Detected
Anthracene	5.0	1.0	Not Detected	Not Detected
Butylbenzene	10	2.0	Not Detected	Not Detected
sec-Butylbenzene	10	2.0	Not Detected	Not Detected
tert-Butylbenzene	10	2.0	Not Detected	Not Detected

Air Sample Volume(L): 5.00

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	50-150
Toluene-d8	88	50-150
Naphthalene-d8	92	50-150

Client Sample ID: Lab Blank

Lab ID#: 1603302-08A

EPA METHOD TO-17

File Name:	18031810	Date of Extraction: NA	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 3/18/16 01:51 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Hexane	35	7.0	Not Detected	Not Detected
Benzene	6.4	1.3	Not Detected	Not Detected
Cyclohexane	6.9	1.4	Not Detected	Not Detected
Toluene	7.5	1.5	Not Detected	Not Detected
Ethyl Benzene	4.3	0.86	Not Detected	Not Detected
m,p-Xylene	8.7	1.7	Not Detected	Not Detected
o-Xylene	8.7	1.7	Not Detected	Not Detected
Styrene	8.5	1.7	Not Detected	Not Detected
Cumene	9.8	2.0	Not Detected	Not Detected
Propylbenzene	9.8	2.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	9.8	2.0	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	5.8	Not Detected	Not Detected
Naphthalene	1.0	0.20	Not Detected	Not Detected
2-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
1-Methylnaphthalene	1.0	0.20	Not Detected	Not Detected
Acenaphthene	5.0	1.0	Not Detected	Not Detected
Fluorene	5.0	1.0	Not Detected	Not Detected
Anthracene	5.0	1.0	Not Detected	Not Detected
Butylbenzene	10	2.0	Not Detected	Not Detected
sec-Butylbenzene	10	2.0	Not Detected	Not Detected
tert-Butylbenzene	10	2.0	Not Detected	Not Detected

Air Sample Volume(L): 5.00

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	50-150
Toluene-d8	88	50-150
Naphthalene-d8	95	50-150

Client Sample ID: CCV

Lab ID#: 1603302-09A

EPA METHOD TO-17

File Name:	18031805	Date of Extraction:	NA	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis: 3/18/16 08:07 AM			

Compound	%Recovery
Hexane	132 Q
Benzene	123
Cyclohexane	113
Toluene	99
Ethyl Benzene	97
m,p-Xylene	95
o-Xylene	110
Styrene	112
Cumene	112
Propylbenzene	120
1,3,5-Trimethylbenzene	108
1,2,4-Trimethylbenzene	108
Naphthalene	101
2-Methylnaphthalene	87
1-Methylnaphthalene	87
Acenaphthene	76
Fluorene	77
Anthracene	76
Butylbenzene	92
sec-Butylbenzene	96
tert-Butylbenzene	97

Air Sample Volume(L): 1.00

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	50-150
Toluene-d8	88	50-150
Naphthalene-d8	87	50-150

Client Sample ID: LCS

Lab ID#: 1603302-10A

EPA METHOD TO-17

File Name:	18031806	Date of Extraction:	NA	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	3/18/16 09:19 AM		

Compound	%Recovery	Method Limits
Hexane	135 Q	70-130
Benzene	118	70-130
Cyclohexane	115	70-130
Toluene	99	70-130
Ethyl Benzene	98	70-130
m,p-Xylene	97	70-130
o-Xylene	113	70-130
Styrene	114	70-130
Cumene	114	70-130
Propylbenzene	125	70-130
1,3,5-Trimethylbenzene	110	70-130
1,2,4-Trimethylbenzene	111	70-130
Naphthalene	113	70-130
2-Methylnaphthalene	112	70-130
1-Methylnaphthalene	112	70-130
Acenaphthene	102	70-130
Fluorene	106	60-140
Anthracene	102	60-140
Butylbenzene	Not Spiked	60-140
sec-Butylbenzene	Not Spiked	60-140
tert-Butylbenzene	Not Spiked	60-140

Air Sample Volume(L): 1.00

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	50-150
Toluene-d8	88	50-150
Naphthalene-d8	92	50-150

Client Sample ID: LCSD

Lab ID#: 1603302-10AA

EPA METHOD TO-17

File Name:	18031807	Date of Extraction: NA	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 3/18/16 10:21 AM	

Compound	%Recovery	Method Limits
Hexane	136 Q	70-130
Benzene	123	70-130
Cyclohexane	114	70-130
Toluene	101	70-130
Ethyl Benzene	98	70-130
m,p-Xylene	98	70-130
o-Xylene	114	70-130
Styrene	114	70-130
Cumene	116	70-130
Propylbenzene	126	70-130
1,3,5-Trimethylbenzene	111	70-130
1,2,4-Trimethylbenzene	113	70-130
Naphthalene	113	70-130
2-Methylnaphthalene	109	70-130
1-Methylnaphthalene	109	70-130
Acenaphthene	95	70-130
Fluorene	93	60-140
Anthracene	83	60-140
Butylbenzene	Not Spiked	60-140
sec-Butylbenzene	Not Spiked	60-140
tert-Butylbenzene	Not Spiked	60-140

Air Sample Volume(L): 1.00

Q = Exceeds Quality Control limits.

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	50-150
Toluene-d8	88	50-150
Naphthalene-d8	90	50-150

TO-17 SAMPLE COLLECTION



CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922.

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630
(916) 985-1000 FAX (916) 985-1020

Page 1 of 1

Project Manager Andrew Weller

Collected by: (Print and Sign) Rodney Gurrte Rodney Ryan

Company AD5/Altra Eng. Sols. Email rodneygurrte@ad5.com

Address PO Box 345 City Ester State AK Zip 99725

Phone 907-457-3147 Fax _____

Project Info:

P.O. # _____

Project # 20266.014.01

Project Name Ruby PACD

Turn Around Time:

☒ Normal

☐ Rush

Reporting Units:

☐ ppmv

☐ ppbv

☒ µg/m3

specify _____

Lab I.D. Field Sample I.D. (Location)

Engraved or Stamped Tube #

Date of Collection (mm/dd/yy)

Start Time (hr : min)

End Time (hr : min)

Pre-Test Flow Rate

Post-Test Flow Rate

Volume

Indoor/Outdoor % RH

Temp

Indoor Air

Outdoor Air

Soil Vapor

Other ()

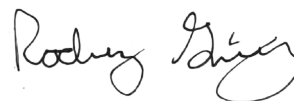
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
<u>Rodney Ryan</u>	<u>3/15/16</u>	<u>in my EATL 1000</u>	<u>3/16/16</u>
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes: Samples collected in intervals with graduated syringes. Total volume 5.0 L

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	<u>SCOR</u>		<u>11K</u>	<u>GOOD</u>	☒ Yes ☐ No ☐ None	<u>1603302</u>

3/16/16 2.4°C

Date: 4/4/2016
Project name: Ruby Former Headstart PACP
Laboratories: SGS Anchorage, Eurofins Air Toxics Inc.
Sample Delivery Groups: 1158702 (SGS), 1603302 (EAT)
Reviewed by: Rodney Guritz
Title: Principal Chemist



To: Andrew Weller
Ahtna Engineering Services, LLC
1896 Marika Road, Suite 8
Fairbanks, AK 99709

Data Quality Assessment

This letter summarizes the findings of a data quality assessment (DQA) conducted by Arctic Data Services, LLC (ADS) for the above-referenced project data. Precision, accuracy, sensitivity, representativeness, comparability, and completeness of the data was evaluated by reviewing laboratory-supplied quality assurance/quality control (QA/QC) information as well as conducting independent QA/QC checks on the data. The review was conducted in accordance with ADS standard data review procedures, informed by guidance from various state and federal documents, including the Alaska Department of Environmental Conservation (ADEC) Environmental Laboratory Data and Quality Assurance Requirements technical memorandum (2009), the US Environmental Protection Agency (USEPA) National Functional Guidelines for Superfund Organic Methods Data Review (2008), and the US Army Corps of Engineers (USACE) Engineering Manual (EM) 200-1-10 Guidance for Evaluating Performance-Based Chemical Data (2005). In the absence of project-specific control limits, analytical QC sample recoveries and RPDs were compared to laboratory control-charted limits. Field-duplicate RPDs were compared to ADEC-recommended data quality objectives (DQOs).

ADEC data review checklists were completed for each sample delivery group (SDG), and are attached to this DQA. Also attached is a table summarizing data qualified in the course of our review (Table 1). In the case where a sample result was affected by more than one sample-handling anomaly or QC failure, a determination was made as to which qualifier is most conservative, and only that qualifier is retained and reported. The following sections provide a summary of our findings for each QA/QC element reviewed; anomalies that had no impact to data quality are discussed in the ADEC data review checklist, and are not further described herein.

Sample Preservation, Handling, Custody, and Holding Times

Sample receipt forms were reviewed to check that samples were received in good condition, properly preserved, and within the required temperature range. Chain of custody forms were reviewed to confirm that

custody was not breached during sample handling. Dates of sample collection, preparation, and analysis were compared to check that method holding times were not exceeded.

There were no sample preservation, handling, custody, or holding-time anomalies that affected data quality for this project.

Analytical Sensitivity

Analytical sensitivity was evaluated by checking that reporting limits were below the applicable screening and/or cleanup levels where target analytes were not detected. Soil-sample LODs were compared to ADEC 18 AAC 75.340 (2012) Table B1 and B2 Soil Cleanup Levels (under-40-inch zone, most-stringent pathway). Air-sample practical quantitation limits (PQLs) were compared to ADEC target levels for commercial indoor air or commercial shallow soil gas (crawlspaces samples).

Soil-sample LODs were below soil cleanup levels and air-sample PQLs were below target levels for all non-detect results.

Method Blanks

The laboratory analyzed and reported a method blank for each preparatory batch, to check for laboratory-based sample contamination. No analytes were detected above limits of quantitation (LOQs) in method blanks associated with project samples. However, multiple analytes were detected in method blanks associated with soil samples analyzed by AK101, 8021B, 8260B, and 8270D SIM. Of the associated project-sample results, GRO results for three samples, toluene results for five samples, and p&m-xylene results for one sample were affected. See ADEC data review checklist for details.

Trip Blanks

Two trip blanks were submitted with soil samples for analysis by AK101, 8021B, and 8260B, to check for cross-contamination of samples during sampling, shipment, or storage. The only analyte detected in the trip blank was GRO, and this result was considered attributable to laboratory-based sample contamination, due to a similar detection in the method blank. No results were affected by detections in the trip blanks.

Laboratory Control Samples

The laboratory analyzed and reported a laboratory control sample (LCS) for each preparatory batch, to assess laboratory extraction efficiency and analytical accuracy. In some cases, LCS duplicates (LCSDs) were used to assess analytical precision. LCS and LCSD recovery information and LCS/LCSD RPD information (where available)

was reviewed. There were recovery and RPD failures, though none affected project-sample data quality; see ADEC data review checklists for details.

Matrix Spike Samples

The laboratory analyzed and reported matrix spike (MS) and MS duplicate (MSD) samples to check for potential matrix interference. MS/MSD recovery and RPDs were evaluated only if the parent sample (the sample spiked for the MS/MSD) was in the project-sample set. There were no MS/MSD recovery or RPD failures affecting project-sample data quality.

Surrogate Recovery

Samples submitted for analysis of organic compounds were spiked with analyte surrogates to evaluate extraction efficiency and to check for matrix interference. Surrogate recoveries were reviewed for each project sample and analysis. There were a number of surrogate recovery failures due to dilution; these failures do not affect data quality, surrogate recovery information is not relevant for diluted samples. GRO surrogate 4-bromofluorobenzene was recovered above control limits for seven samples due to matrix interference. Affected GRO results are considered biased high, and flagged 'JH.' See ADEC data review checklist for the list of affected sample. Affected results (with a high bias) were above cleanup levels in some cases, but these samples also contained DRO well above cleanup levels, so impact to data usability was minimal.

Field Duplicates

Field duplicate samples were collected for soil and air samples. The field-duplicate collection frequency met the 10% requirement in the FSP. RPDs between field-duplicate results were calculated where at least one of the results was quantitatively detected (above the PQL). In cases where one result was above the LOQ but the other result was not detected, an RPD was calculated using the PQL for the non-detect result.

RPDs exceeded the DQO of 50% for toluene in field duplicate pair 15-RBY-SB-16-4 / 15-RBY-SD-16-4. However, results were also affected by contamination identified in the method blank, flagged 'JH' (15-RBY-SB-16-4) and 'UB' (15-RBY-SD-16-4). These flags are retained as the more conservative and final flags. Affected results were several orders of magnitude below the cleanup level.

Other QC Anomalies

The laboratory noted no other QC anomalies affecting data quality or usability.

Summary of Data Quality Indicators

The following sections summarize the findings of the above review with respect to the six data quality indicators: sensitivity, precision, accuracy, representativeness, comparability, and completeness.

Sensitivity

Sensitivity describes the ability of the sampling and analytical methodology to meet detection and/or quantitation limit objectives. LODs and PQLs met relevant cleanup and target levels for soil and air samples, respectively. Sensitivity is deemed sufficient for purposes of this project.

Precision

Precision is a measure of the reproducibility of repetitive measurements. Precision was evaluated based on laboratory QC-sample and field-duplicate sample RPDs. There was one field-duplicate RPD failure, but impact to data usability was minimal. Precision is deemed acceptable for purposes of this project.

Accuracy

Accuracy is a measure of the correctness, or the closeness, between the true value and the quantity detected. Accuracy was evaluated based on analyte recoveries for laboratory QC samples and recovery of surrogate spikes for project samples. There were multiple surrogate recovery failures affecting the accuracy of GRO results; however, as described above, impact to data usability was minimal. Accuracy is deemed acceptable for purposes of this project.

Representativeness

Representativeness describes the degree to which data accurately and precisely represent site characteristics. Representativeness is affected by factors such as sample frequency and matrix or contaminant heterogeneity, as well as analytical performance (including sensitivity, accuracy, and precision) sample cross-contamination. Samples were collected in accordance with an approved work plan, analytical precision was acceptable, and the only results affected by detections in blank samples were well below cleanup levels. Representativeness was deemed acceptable for purposes of this project.

Comparability

Comparability describes whether two data sets can be considered equivalent with respect to project goals. Comparability is affected by factors such as sampling methodology and analytical performance (including sensitivity, accuracy, and precision). Comparability was evaluated by checking that standard analytical methods were employed and analytical performance was acceptable. Comparability was acceptable for this project.

Completeness

Completeness describes the amount of valid data obtained from the sampling event(s). It is calculated as the percentage of valid measurements compared to the total number of measurements. All project-sample results were considered usable (no data were rejected), and a completeness score of 100% was calculated for this project.

Conclusions and Limitations

Sensitivity, precision, accuracy, representativeness, comparability, and completeness were deemed acceptable, and the data are usable for the purposes of this project. Impacts to data usability from QC failures were minimal.

Our review was based solely on information provided by the analytical laboratory in the laboratory reports for the SDGs reviewed. We did not review instrument-level QC elements, such as calibration verification or internal standard response, except to the extent that the laboratory identified instrument-level anomalies in the case narrative. We did not conduct independent validation of the data (e.g. recalculating results based on instrument responses) or review any raw chemical data (e.g. chromatograms).

Attachments:

SGS 1158702 ADEC Data Review Checklist
EAT 1603302 ADEC Data Review Checklist

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APPENDIX F

CONCEPTUAL SITE MODEL

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HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Ruby Former Headstart Building
870.38.004

Completed By: Rodney Guritz, ADS for Ahtna
 Date Completed: 1/17/2016

Instructions: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Check the media that could be directly affected by the release.	(2) For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.
Media	Transport Mechanisms
☒ Surface Soil (0-2 ft bgs)	☒ Direct release to surface soil <i>check soil</i> ☒ Migration to subsurface <i>check soil</i> ☒ Migration to groundwater <i>check groundwater</i> ☒ Volatilization <i>check air</i> ☐ Runoff or erosion <i>check surface water</i> ☐ Uptake by plants or animals <i>check biota</i> ☐ Other (list): _____
☒ Subsurface Soil (2-15 ft bgs)	☒ Direct release to subsurface soil <i>check soil</i> ☒ Migration to groundwater <i>check groundwater</i> ☒ Volatilization <i>check air</i> ☐ Uptake by plants or animals <i>check biota</i> ☐ Other (list): _____
☐ Ground-water	☐ Direct release to groundwater <i>check groundwater</i> ☐ Volatilization <i>check air</i> ☐ Flow to surface water body <i>check surface water</i> ☐ Flow to sediment <i>check sediment</i> ☐ Uptake by plants or animals <i>check biota</i> ☐ Other (list): _____
☐ Surface Water	☐ Direct release to surface water <i>check surface water</i> ☐ Volatilization <i>check air</i> ☐ Sedimentation <i>check sediment</i> ☐ Uptake by plants or animals <i>check biota</i> ☐ Other (list): _____
☐ Sediment	☐ Direct release to sediment <i>check sediment</i> ☐ Resuspension, runoff, or erosion <i>check surface water</i> ☐ Uptake by plants or animals <i>check biota</i> ☐ Other (list): _____

(3) Check all exposure media identified in (2).	(4) Check all pathways that could be complete. The pathways identified in this column must agree with Sections 2 and 3 of the Human Health CSM Scoping Form.	(5) Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.						
Exposure Media	Exposure Pathway/Route	Current & Future Receptors						
		Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☒ soil	☒ Incidental Soil Ingestion ☒ Dermal Absorption of Contaminants from Soil ☐ Inhalation of Fugitive Dust	F		C/F	F	F		
☒ groundwater	☒ Ingestion of Groundwater ☒ Dermal Absorption of Contaminants in Groundwater ☒ Inhalation of Volatile Compounds in Tap Water	C/F	F	F				
☒ air	☒ Inhalation of Outdoor Air ☒ Inhalation of Indoor Air ☐ Inhalation of Fugitive Dust	F		C/F		F		
☐ surface water	☐ Ingestion of Surface Water ☐ Dermal Absorption of Contaminants in Surface Water ☐ Inhalation of Volatile Compounds in Tap Water							
☐ sediment	☐ Direct Contact with Sediment							
☐ biota	☐ Ingestion of Wild or Farmed Foods							

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Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name:

File Number:

Completed by:

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: *Follow the italicized instructions in each section below.*

1. General Information:

Sources *(check potential sources at the site)*

- | | |
|--|---|
| ☒ USTs | ☐ Vehicles |
| ☒ ASTs | ☐ Landfills |
| ☐ Dispensers/fuel loading racks | ☐ Transformers |
| ☒ Drums | ☒ Other: <input type="text" value="fuel oil-supplied heaters in building"/> |

Release Mechanisms *(check potential release mechanisms at the site)*

- | | |
|--|--|
| ☒ Spills | ☐ Direct discharge |
| ☒ Leaks | ☐ Burning |
| | ☐ Other: <input type="text"/> |

Impacted Media *(check potentially-impacted media at the site)*

- | | |
|---|--|
| ☒ Surface soil (0-2 feet bgs*) | ☒ Groundwater |
| ☒ Subsurface soil (>2 feet bgs) | ☐ Surface water |
| ☒ Air | ☐ Biota |
| ☐ Sediment | ☐ Other: <input type="text"/> |

Receptors *(check receptors that could be affected by contamination at the site)*

- | | |
|--|---|
| ☒ Residents (adult or child) | ☒ Site visitor |
| ☐ Commercial or industrial worker | ☒ Trespasser |
| ☒ Construction worker | ☒ Recreational user |
| ☐ Subsistence harvester (i.e. gathers wild foods) | ☐ Farmer |
| ☐ Subsistence consumer (i.e. eats wild foods) | ☐ Other: <input type="text"/> |

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.) ☒

If the box is checked, label this pathway complete:

Complete

Comments:

Soil contamination is present from approximately 1 foot to 9 feet bgs.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)? ☒

If both boxes are checked, label this pathway complete:

Complete

Comments:

PAHs are present, and may be dermally absorbed

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future? ☒

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350. ☒

If both boxes are checked, label this pathway complete:

Complete

Comments:

Soil contamination has been vertically delineated and does not extend to GW. GW is anticipated to be deep at this site. However, we have no firm evidence of a confining layer or other feature preventing potential future migration of contaminants to GW. This pathway is considered open pending further investigation.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

☐

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

☐

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

The site is over 600 feet from the nearest water body, the Yukon River. Contaminants, even if present in groundwater, are not expected to migrate to surface water due to the distance and soil type.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

☒

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

☐

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

☐

If all of the boxes are checked, label this pathway complete:

Incomplete

Comments:

The site is in the middle of town and could possibly used for gardening. However, affected areas are currently void of vegetation, and site contaminants do not have the potential to bioaccumulate (according to Appendix C in the guidance document) - pathway considered incomplete.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

☒

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

☒

If both boxes are checked, label this pathway complete:

Complete

Comments:

BTEX is present at high concentrations near the surface.

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)



Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?



If both boxes are checked, label this pathway complete:

Complete

Comments:

BTEX concentrations are high within 10 feet of the building, and odors have been noted in the crawlspace and building in the past.

3. Additional Exposure Pathways: *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- o Climate permits recreational use of waters for swimming.
- o Climate permits exposure to groundwater during activities, such as construction.
- o Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:



Comments:

See ingestion of groundwater pathway, above.

Groundwater could be used for household purposes, such as bathing or cleaning.

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- o The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- o The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:



Comments:

See ingestion of groundwater pathway, above.

Groundwater could be used for household purposes, such as bathing or cleaning.

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- o Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- o Dust particles are less than 10 micrometers (Particulate Matter - PM₁₀). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- o Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

Check the box if further evaluation of this pathway is needed:

☐

Comments:

Clean fill was placed over the site in 2011. Contamination is not present in the top 2 cm of soil.

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- o Climate permits recreational activities around sediment.
- o The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed:

☐

Comments:

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

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APPENDIX G

ADDITIONAL SITE PHOTOGRAPHS

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Photo 1 – Former Headstart building and property



Photo 2 – View of Ruby from bluffs west of town



Photo 3 – Bent-over UST fill/vent pipe



Photo 4 – Former generator building repurposed as cabin on adjoining property



Photo 5 – Main room of former Headstart building, facing NE



Photo 6 – Main room of former Headstart building, facing N



Photo 7 – Building material staged in former Headstart building



Photo 8 – Classroom in northeast end of building



Photo 9 – Classroom in northeast end of building



Photo 10 – Bathroom



Photo 11 – Forced-air furnace



Photo 12 – Corner of furnace room with fuel-affected flooring



Photo 13 – Possible tank support in former generator building area



Photo 14 – Excavating test pit in former generator building area



Photo 15 – Test pit TP-01



Photo 16 – Excavating test pit TP-02



Photo 17 – Silt clump from test pit TP-02



Photo 18 – 0-4 feet bgs, TP-02. Grey silt had highest PID readings



Photo 19 – Drainage improvements on northeast end of building



Photo 20 – Hand-auguring soil borings in former AST area



Photo 21 – Hand-auguring SB-16 between UST and building



Photo 22 – Gravel pit on Ruby-Poorman Road (~3.3 mile)



Photo 23 – Closed gravel pit on Ruby-Poorman Road (~4.2 mile)



Photo 24 – Gravel pit on Ruby-Poorman Road (~4 mile)



Photo 25 – Crawlspace soil sampling



Photo 26 – Building crawlspace – mushrooms growing in soil



Photo 27 – Crawlspace under northeast end of building



Photo 28 – Vents installed in crawlspace skirting



Photo 29 – Tan/brown floor tile (Room A, sample AS02, 1.3% asbestos)



Photo 30 – Sheet vinyl (Room B, sample AS04, 25% asbestos)



Photo 31 – Mastic for off-white tile (Room C, sample AS05, 1.2% asbestos)



Photo 32 – Off white/black 9x9 floor tile and mastic (Room D&E, sample AS07, 1.3-3.8%)



Photo 33 – Joint compound (Room E, sample AS08, 1.2% asbestos)



Photo 34 – Tan/black mastic (Room I, Sample AS11, 1.5% asbestos)



Photo 35 – Preparing TO-17 tubes for air sampling

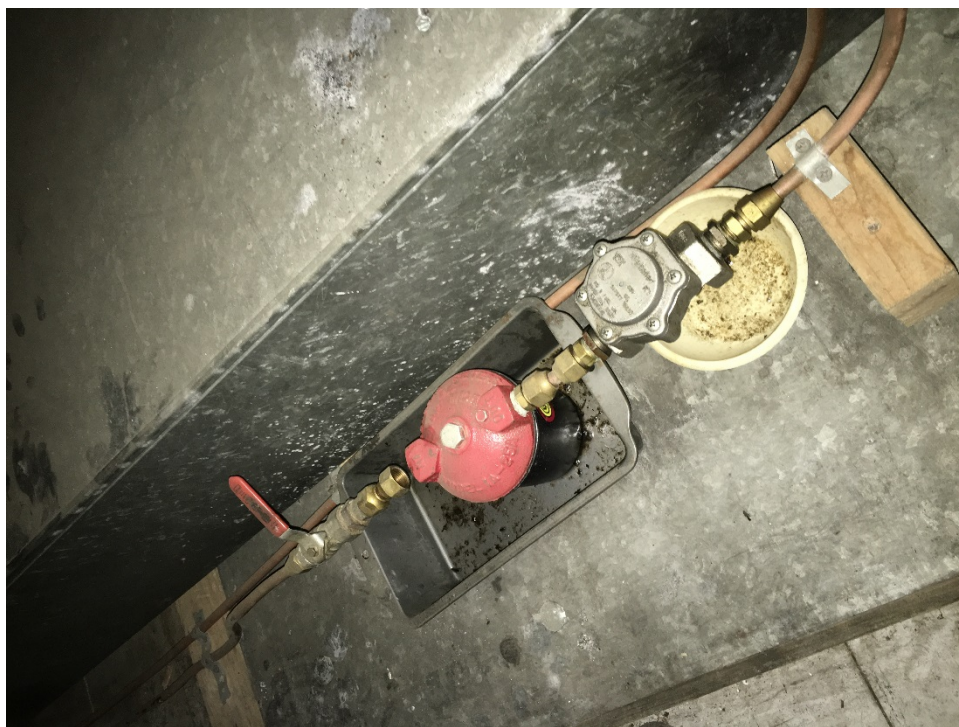


Photo 36 – Disconnected fuel piping in furnace room



Photo 37 – Southwest crawlspace air sampling location



Photo 38 – Tubing rigged up to sampler for crawlspace air sampling



Photo 39 – Site in use during 2016 Iditarod (at time of air sampling)



Photo 40 – Another checkpoint photo (showing heating-oil AST in background)