RED TOP MILL ASSESSMENT
ALEGNAGIK, ALASKA

April 2008

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

At Shannon & Wilson, our mission is to be a progressive, well-managed professional consulting firm in the fields of engineering and applied earth sciences. Our goal is to perform our services with the highest degree of professionalism with due consideration to the best interests of the public, our clients, and our employees.

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ALEGNAGIK, ALASKA

April 10, 2008

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31-1-11361-001

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RED TOP MILL ASSESSMENT
ALEGNAGIK, ALASKA

1.0 INTRODUCTION

This report describes the methods and findings for our Red Top Mill Site closure project. Field activities were conducted in coordination with the Bureau of Land Management (BLM) and in general accordance with our proposal dated April 20, 2007, and our Alaska Department of Environmental Conservation (ADEC)-approved Work Plan dated July 2007. Shannon & Wilson performed this work under our BLM contract NAC040272 and project work order LAD72004.

1.1 Site Description and Background

The Red Top Mill Site (site) is on the north bank of the Wood River, approximately 2 miles downstream from Aleknagik in Section 32, Township 10 South, Range 55 West, Seward Meridian (Figure 1). The site is generally level, and access is not restricted.

The following site background is based on information provided by BLM.

Cinnabar was discovered on Marsh Mountain in 1941. A retort furnace formerly located at the site processed the mercury ore from the nearby Red Top Mine between 1952 and 1955. In 1985, BLM issued abandoned and void decisions for the mining claims and the mill site for failure to file assessment work for 1979-1981 and 1984. The surrounding land has been conveyed to the Aleknagik Natives, Ltd. The mill-site parcel has been surveyed and excluded from the conveyance (USS 12403). The parcel boundaries are shown in Figure 2.

BLM became aware of hazardous materials issues at the site in 1992 and initiated a voluntary cleanup. Site characterization, interim removal activities, and site remediation began in 1994; petroleum- and hydrocarbon-contaminated soil was stockpiled on-site. The excavation was lined and backfilled. Work progressed in stages with some periods of inactivity. The Environmental Protection Agency (EPA) placed the site on the Federal Agency Hazardous Waste Compliance Docket (Docket) on June 27, 1997. In 1998, work was completed on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-based Emergency Removal Action at the retort site. During that summer, stockpiled mercury- and petroleum-

contaminated soils were removed from the site. The materials were loaded on a barge, taken to Dillingham, and shipped to disposal sites in the Lower 48. BLM completed the CERCLA-required Preliminary Assessment (PA) for the site on December 31, 1998. EPA notified BLM on September 10, 1999, that after evaluating the PA and Remedial Action reports, the Hazard Ranking System score was not high enough for the site to be listed on the National Priorities List. The Docket now reflects a No Further Remedial Action Planned status for the site.

A map showing the location of the former site features and the extent of the 1994 corrective action is presented in Figure 2.

BLM is currently seeking closure as a contaminated site from the ADEC. Site investigations were conducted during 1998 and 1999; a Summary Report was generated in 2000. These reports document that some residual mercury contamination remains on the site. In September 2005, ADEC notified BLM that additional information was required to grant conditional closure status for the site.

1.2 Project Objectives and Scope

The objective of this work was to assist BLM with addressing some of the ADEC's requests for additional information. The ADEC letter requesting this information from BLM is attached to this report (Appendix A). The ADEC is requiring this information to support a conditional closure of the site. The items we addressed in this project include (numbers refer to the ADEC letter):

#2 – Evaluate and provide information on the potential for erosion of the site due to river currents and flooding;

#3 – Provide more information to demonstrate whether groundwater contamination has occurred that may pose an unacceptable risk to human health or ecological receptors in the Wood River; and

#4 – Provide information on the volume, location, and chemical makeup of waste rock and processed ore from the retort operations.

We understand BLM will address the remaining items requested by ADEC. To address the items listed above, we completed the following scope of work:

- We prepared a work plan for ADEC approval.

- With the assistance of BLM, we prepared a base map to document previous work conducted at the site.
- We installed and sampled three temporary well points.
- We visited the site and surrounding area to determine the potential for flooding and bank erosion. We also assessed the potential for the presence of waste rock or processed ore at the site.
- We prepared this report presenting our findings, results of analytical testing, and our conclusions.

1.3 Groundwater Cleanup Levels

Groundwater data collected for this assessment was compared to cleanup levels in the ADEC *Oil and Other Hazardous Substances Pollution Control 18 AAC 75*. ADEC's groundwater cleanup level for mercury is 0.002 mg/L.

2.0 FIELD METHODS

The following section presents the methodology we used to obtain information needed to address the ADEC's concerns outlined in Section 1.2. Our findings are presented in Sections 3.0 (Results) and 4.0 (Field Observations). Photographs of our field visit are attached in Appendix B.

2.1 Site Visit

Between August 21 and 23, 2007, Mark Lockwood and Rodney Guritz, a geologist and environmental chemist with Shannon & Wilson, visited the site; they were accompanied by Larry Beck, project manager for the BLM. Mr. Beck provided a description of past activities and traversed the site with Mr. Lockwood and Mr. Guritz to become familiar with its layout.

2.2 Erosion Potential Assessment

To assess the potential for bank erosion at the site, we spoke with local residents, reviewed aerial photographs, and examined the river banks. We contacted Jason Dye of the Alaska Department of Fish and Game, and the owners of the Aleknagik Schoolhouse Inn (Carolyn Smith [life-long resident] and Pat Owens). Prior to mobilizing to the field, we observed the river stage in aerial

photographs from 1974 and LANDSAT images from June 28, 2002, and October 31, 2005. We discussed flooding events with the local residents to gain an understanding of the conditions surrounding the flooding, and observed the banks of the Wood River above and below the site using a motor boat. Upon our return to Fairbanks, we compared the 1974 photograph with the BLM's recent (August 6, 2007) aerial photograph.

2.3 Well Point Installation and Groundwater Sampling

We installed three temporary well points along the bank of the Wood River to assess the potential for the presence of mercury in the groundwater. The temporary well points were constructed of 3/4-inch-diameter stainless steel pipe with a 1-foot-long stainless steel screen at the end; well points were installed by driving them into the ground with a slide hammer. Their locations are shown in Figure 3. We collected groundwater samples from the well points using a peristaltic pump equipped with new tubing at each location, and purged approximately 3 gallons of groundwater from each well prior to sampling. The sampler donned new nitrile gloves at each sampling location. The water was placed in plastic jars provided by the laboratory and maintained at approximately 4°C in a cooler until delivered to the laboratory. The samples were not preserved at the site due to logistical complications associated with transporting nitric acid by air carrier; the preservative was added once the samples reached the laboratory, in accordance with our work plan. The water samples were submitted to SGS Environmental Services (SGS) in Anchorage for analysis of mercury by Environmental Protection Agency (EPA) Method SW7470A.

The purge water was discharged onto the ground surface away from the river. We removed the well points following the collection of groundwater samples.

We compared the water level in the well points to that of the river to determine the direction of the groundwater gradient. In all three wells, the gradient was towards the river.

2.4 Waste Rock and Processed Ore Assessment

The ADEC requested information regarding waste rock or processed ore at the site. To be able to better recognize waste rock, we visited the mine site on Marsh Mountain and noted the host rock (rock surrounding and intermingled with the ore) is a tan to gray, fine-grained sedimentary rock (greywacke); cinnabar (mercury ore) is easily recognizable due to its red color. According to the United States Geological Survey (USGS) Alaska Resource Data File for the Red Top Mine, the

cinnabar occurred as discrete veins up to 4-inches thick and as disseminations in fractured greywacke. To assess the potential for the presence of waste rock or processed ore at the site, we excavated 18 test pits using a hand-spade; the locations of the test pits are shown in Figure 2. We noted the angularity of the material present in each of the pits. Waste rock is typically angular, having been blasted or broken in the mine; processed ore would be angular and would likely have a burnt appearance, having been processed in a retort furnace.

3.0 ANALYTICAL RESULTS

The three water samples and a field duplicate collected from the temporary well points did not contain mercury above its laboratory practical quantitation limit (PQL) of 0.000200 mg/L. The laboratory analysis report is in Appendix C.

3.1 Quality Assurance/Quality Control

Quality Assurance/Quality Control (QA/QC) procedures assist in producing data of acceptable quality and reliability. We reviewed the analytical results for laboratory QC samples and also conducted our own QA assessment for this project. Our QA review procedures allowed us to document the accuracy and precision of the analytical data, as well as check that the analyses were sufficiently sensitive to detect mercury at levels below the ADEC cleanup level. The laboratory report for this project's samples is included in Appendix C of this report. Details regarding the results of our QA review are presented below.

3.1.1 Sample Handling

Samples were analyzed by SGS in Anchorage. SGS is an ADEC-approved laboratory for Contaminated Sites.

We reviewed the chain-of-custody (COC) record and laboratory receipt form to confirm custody was not breached. Temperature blanks and cooler temperatures were measured to confirm the samples were kept properly chilled during shipping; the cooler was within the acceptable temperature range (between 2ºC and 6ºC) upon arrival at SGS. The samples were analyzed within their specified hold times.

Samples were handled in accordance with our work plan. There were no sample-handling anomalies identified that would adversely affect data quality for this project.

3.1.2 Analytical Sensitivity

The groundwater sample results had PQLs below the ADEC groundwater cleanup levels for mercury.

A laboratory method blank was run in association with the samples collected for this project to check for contributions to the analytical results possibly attributable to laboratory-based contamination. The method blank did not contain mercury in excess of its PQL.

3.1.3 Accuracy

Laboratory analytical accuracy was assessed through evaluating mercury recoveries from matrix spike (MS), MS duplicate (MSD), and laboratory control sample (LCS) analyses. The MS, MSD, and LCS samples were within the laboratory's acceptable range.

3.1.4 Precision

We collected one set of field duplicate samples to evaluate the precision of analytical measurements, as well as the reproducibility of our sampling technique. To evaluate the precision of the data, we calculate the relative percent difference (RPD; difference between the sample and its duplicate divided by the mean of the two); we could not calculate the RPD for this field sample pair since the results for both the sample and its duplicate were not above the method detection limits.

Laboratory analytical precision can also be evaluated by RPD calculations. The laboratory analyzed MS and MSD samples to assess the accuracy of their analytical procedures by checking their ability to recover mercury added to samples with matrices similar to our project samples. Calculation of the MS/MSD RPD is used to assess laboratory analytical precision. The result of the MS/MSD RPD calculation was within the laboratory's acceptable range.

3.1.5 QC Summary

By operating in accordance with our work plan, the samples we collected are considered to be representative of site conditions at the locations and times they were obtained. Based on our QA review, no samples were rejected as unusable due to quality control failures, and our completeness goal of obtaining 85 percent useable data was met. The quality of the analytical data for this project does not appear to have been compromised by any analytical irregularities.

In our opinion, the laboratory results are valid for interpreting groundwater quality at the Red Top Mill site.

4.0 FIELD OBSERVATIONS

4.1 Erosion Potential

Based on discussions with local residents, aerial photograph review, and river bank observations, it is our opinion that there is a low potential for bank erosion at the site. Local residents informed us the flooding on the Wood River below Aleknagik Lake is the result of a combination of extremely high tides and onshore winds; the river essentially backs up until these conditions subside. The site becomes inundated with flood waters during these events but the receding water appears to have little effect on the riverbank stability. Aerial photographs show there has been very minimal change in the bank configuration over the last 30 years. The profile of the river banks in the area of the site is gently sloped and shows little indication of high-water erosion. There was no evidence of bank erosion typical of high-velocity river flow.

4.2 Waste Rock

We did not observe material with characteristics of waste rock or processed ore at the site. We dug 18 test pits and traversed the river bank several times; the material observed was rounded alluvial gravel, cobbles and boulders. We did not penetrate the liner to assess the area excavated during the corrective actions around the former retort building.

5.0 CONCLUSIONS

Based on the results of analytical testing, our field observations, and findings, we present the following responses to ADEC's request for additional information.

> #2 – *Evaluate and provide information on the potential for erosion of the site due to river currents and flooding.*

In our opinion, there is a low potential for bank erosion at the site. The nature of the flooding that has occurred at the site in the past results in the presence of standing water but does not appear to have resulted in bank erosion typical of high-velocity river flow.

#3 – *Provide more information to demonstrate whether groundwater contamination has occurred that may pose an unacceptable risk to human health or ecological receptors in the Wood River.*

Quest Environmental collected three water samples and a field duplicate from temporary well points at the site in 1994. Mercury in these samples ranged from 0.00099 to 0.0014 mg/L, less than the ADEC groundwater cleanup level of 0.002 mg/L. The latest water samples and field duplicate we collected from the temporary well points did not contain mercury above its laboratory PQL of 0.000200 mg/L. The groundwater gradient at the time of our sampling was toward the river; our measurements indicated groundwater interacts with the river.

#4 – *Provide information on the volume, location, and chemical makeup of waste rock and processed ore from the retort operations.*

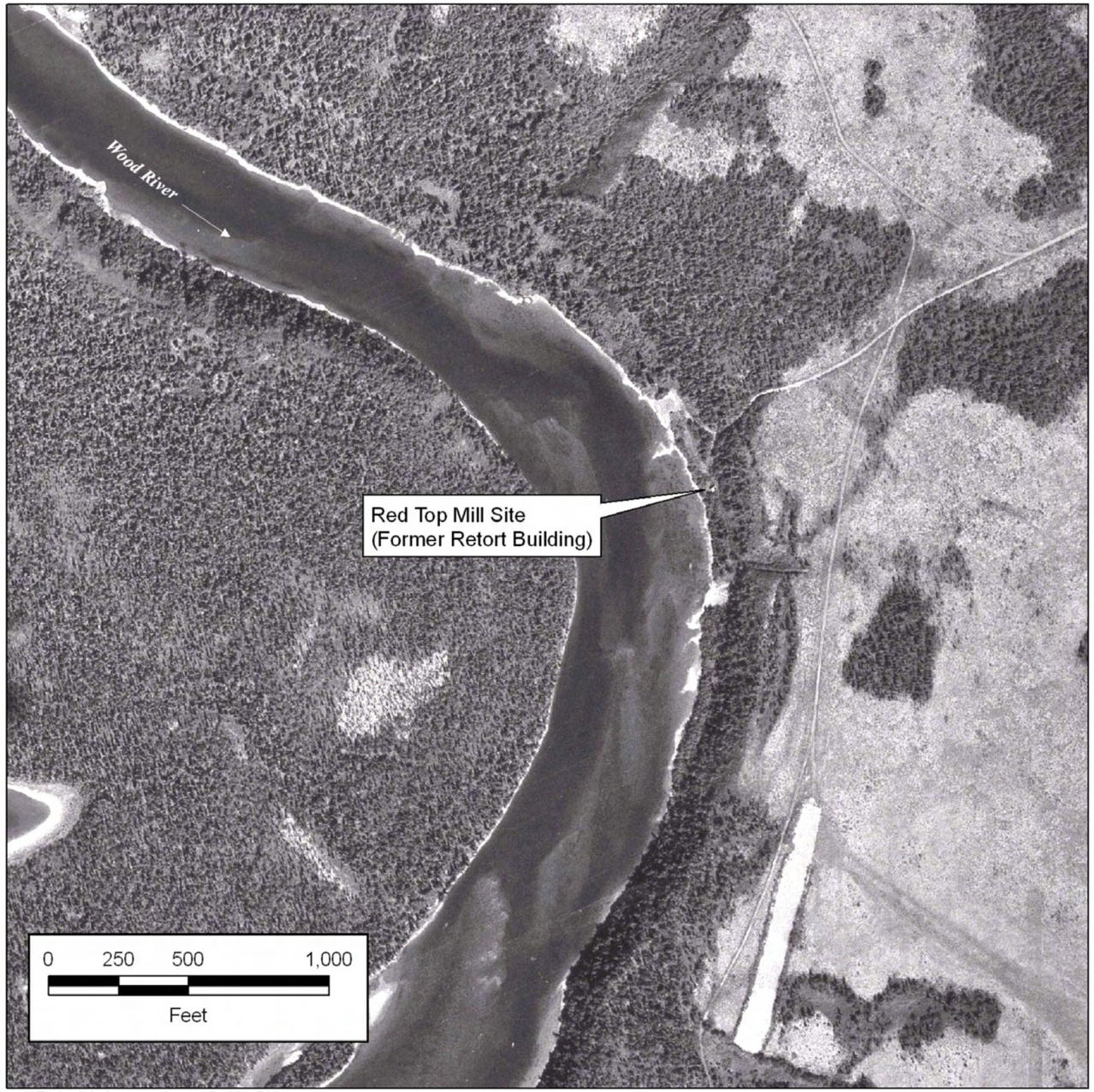
We did not observe or collect samples of material that had characteristics of waste rock or processed ore at the site.

6.0 LIMITATIONS

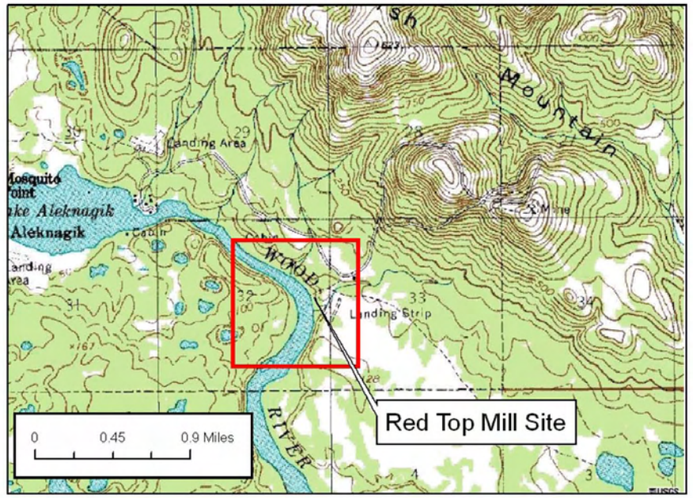
This report presents conclusions based on limited sampling and analysis from three well points, and should not be construed as a comprehensive study of the groundwater quality at the site. Sampling was intended to evaluate the presence or absence of mercury contamination at the locations selected. The levels observed may not be the greatest levels present at the site. It was not the intent of our exploration to detect the presence of contaminants other than those for which laboratory analyses were performed. No conclusions can be drawn on the presence or absence of other contaminants. In addition, our services were not intended to include any geotechnical assessment of the property.

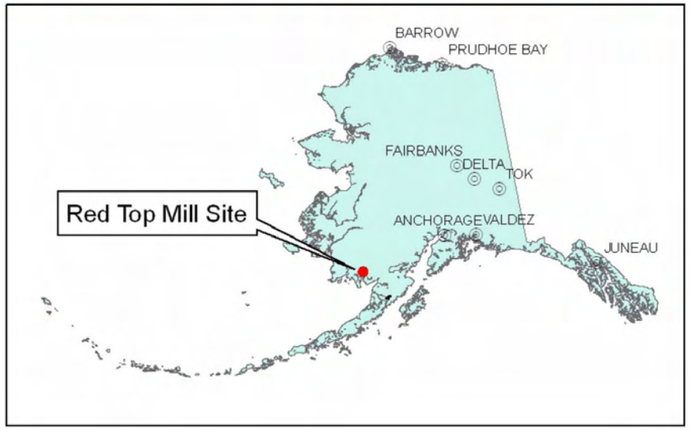
The data presented in this letter report should be considered representative of the time of our site observations and sample collection. Changes in the observed site conditions can occur with the passage of time. In addition, changes in government codes, regulations, or laws may occur. Due to such changes, or others beyond our control, our observations and conclusions regarding this site may need to be revised. In addition, there can be no assurance that a regulatory agency or its staff will reach the same conclusions as Shannon & Wilson, Inc.

This report was prepared for the exclusive use of the BLM to satisfy some of the requests for information issued by the ADEC. If it is made available to others, it should be for information on factual data only and not as a warranty of conditions described in this report. The interpretations and recommendations are based solely upon information available to Shannon & Wilson, Inc. at the time of this report.



1974 Aerial photograph supplied by BLM





Bureau of Land Management
Red Top Mill Site
Aleknagik, Alaska

SITE LOCATION

April 2008 | 31-1-11361-001

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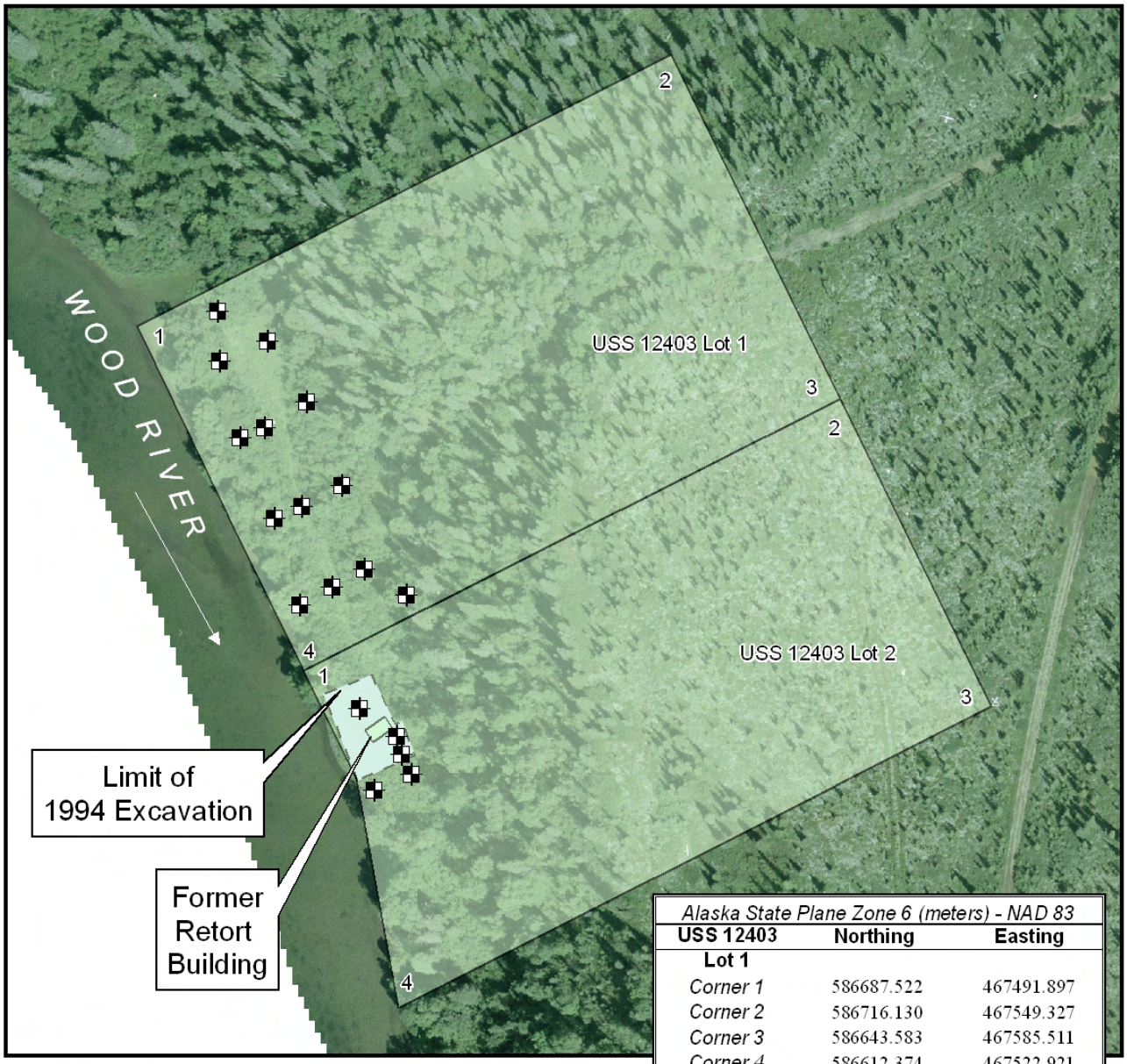
FIGURE 1



2007 orthorectified aerial photograph, property outline, and corner coordinates supplied by BLM; former site features based on 1998 Wilder Site Plan

Alaska State Plane Zone 6 (meters) - NAD 83		
USS 12403	**Northing**	**Easting**
Lot 1		
Corner 1	586687.522	467491.897
Corner 2	586716.130	467549.327
Corner 3	586643.583	467585.511
Corner 4	586612.374	467522.921
Lot 2		
Corner 3	586578.581	467617.940
Corner 4	586515.039	467490.614

Test Pit Location

0 20 40 80 120 160 Feet

N

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Red Top Mill Site
Aleknagik, Alaska

PROPERTY BOUNDARIES AND TEST PIT LOCATIONS

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FIGURE 2

SHANNON & WILSON, INC.
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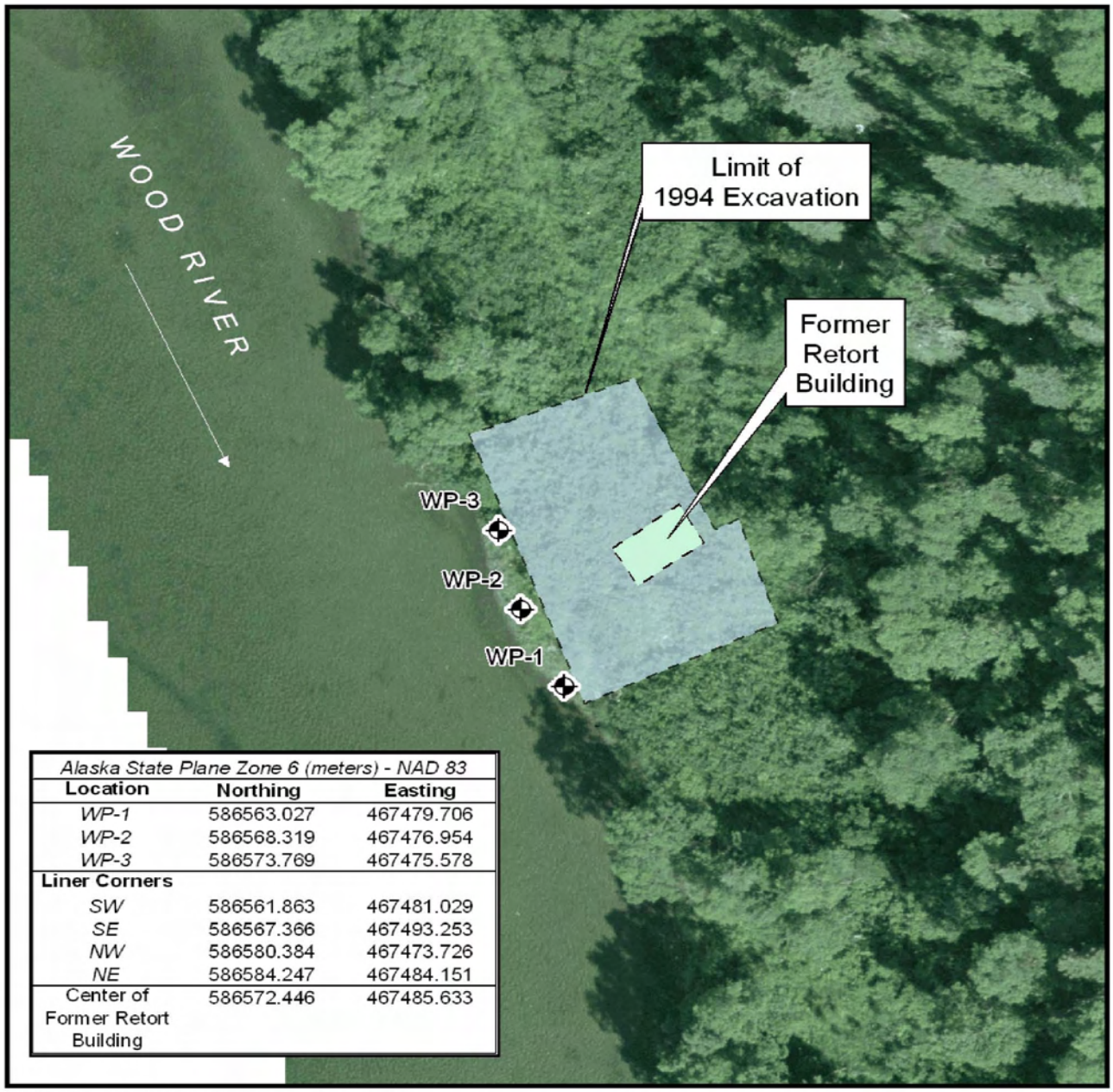
FIGURE 3



Alaska State Plane Zone 6 (meters) - NAD 83		
Location	**Northing**	**Easting**
WP-1	586563.027	467479.706
WP-2	586568.319	467476.954
WP-3	586573.769	467475.578
Liner Corners		
SW	586561.863	467481.029
SE	586567.366	467493.253
NW	586580.384	467473.726
NE	586584.247	467484.151
Center of Former Retort Building	586572.446	467485.633

2007 orthorectified-aerial photograph supplied by BLM.
Former site features based on 1998 Wilder Site Plan.
Locations based on map interpolation from field observations.

2007 Well Point Location

0 5 10 20 30 40
Feet

N

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WELL POINT LOCATIONS

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FIGURE 3

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7526
Fax: (907) 269-7649
http://www.dec.state.ak.us/

File No. 2510.38.002

September 21, 2005

Mr. Wayne Svejnoha
US Bureau of Land Management
222 West 7th Avenue, #13
Anchorage, AK 99513

RE: BLM Red Top Mercury Retort Site,
Database Reckey Number: 1992250928601

Dear Mr. Svejnoha:

The Alaska Department of Environmental Conservation (DEC) has reviewed our file for the Red Top Mercury Retort site near Aleknagik, Alaska. A summary of important information about the site and DEC determinations on it follows.

SITE BACKGROUND

The Red Top Mercury Retort site is located on the north bank of the Wood River approximately 18 miles north of Dillingham and 2 miles east-southeast of Aleknagik in Section 29, Township 10S, Range 5SW of the Seward Meridian. The area of contamination encompasses approximately 1/8th acre of a 5-acre mill-site parcel managed by the United States Bureau of Land Management (BLM). Access to the site is possible by boat from Dillingham or Aleknagik, or by an unmaintained dirt road from Aleknagik.

Cinnabar rich in mercury was discovered on Marsh Mountain in 1941. Exploration of six contiguous unpatented mining claims and minor development work occurred from 1943 – 1952. In 1952, the three partners of the Red Top Mining Co. contracted with the Defense Mineral Exploration Administration and received a grant to continue exploration activities; additional grants were obtained in subsequent years. In 1955, Moneta-Porcupine Mines, Ltd. partnered with the Red Top Mining Co. and later joined by the DeCourcy Mountain Mining Co. Mercury concentrations in the cinnabar were estimated to be as high as 28 percent in some high-grade veins, however the Defense Mineral Exploration Administration decided not to fund any additional exploration as the mercury concentrations did not increase with depth. A 1959 visit to the mine documented it to be inactive. According to one partner in the mine, total production by 1959 was 60 flasks (1 flask = 72 pounds), with rich ore stockpiled which was capable of producing another 60 flasks. The stockpiled ore was shipped to Anchorage for retorting. In the 1960s, the claims were leased to another operator who high-graded ore out of

the tailings at the mine site. There was no reported production from these activities and it is likely that the mill-site was not used.

Cinnabar ore was excavated at an elevation of 1050' from the mines on Marsh Mountain where it was crushed by a ball mill and transported down the mountain to the retort facility at the mill-site approximately 30 feet from the Wood River. The ore was heated in a steel cylinder retort chamber measuring 8.5 feet long and 2 feet in diameter. The chamber was housed in a small wooden structure measuring about 12 feet wide by 16 feet long. Mercury was volatilized out of the heated ore, flowed through condensing tubes, and gathered into flasks for storage before being shipped out. Wood and bunker C fuel were used to fuel the retorting process. It is likely that this retort facility was only used from 1952-1955.

In 1985, BLM issued abandoned and void decisions for the mining claims and the mill-site for failure to file assessment work for 1979-1981 and 1984. These decisions were appealed by Clarence Wren, a former partner in the mining company, but the decision on the mining claims was upheld and the decision on the mill-site was reversed; the mill-site reversal was upheld by the U.S. 9th Circuit Court of Appeals. The surrounding land was conveyed to the Aleknagik Natives, Ltd. The mill-site parcel was later surveyed; it is believed that this was excluded from the conveyance however this has not been confirmed by the BLM real estate section. Also unknown are the BLM's future plans for any conveyance.

SITE HISTORY

On October 1, 1992, soil, sediment, and surface water samples were collected at the mill-site by residents of Aleknagik and Greenpeace. On October 15th, Greenpeace provided sample result data to DEC showing mercury concentrations from three (3) soil samples of 18.6 milligrams per kilogram (mg/kg), 26.7 mg/kg, and 51,400 mg/kg, one (1) Wood River sediment sample of 8.4 mg/kg, and four (4) Wood River water samples of non-detect with a detection limit of 0.001 mg/L. Chain-of-custody shows that a request for petroleum hydrocarbon analysis was made, however those results are not found in our files, only analytical results for mercury are present.

In response to the information provided by Greenpeace, DEC staff visited the site on October 26, 1992, accompanied by a resident of Aleknagik who was present when the samples were collected by Greenpeace. DEC staff collected six (6) soil samples from depths of 6-12 inches below ground surface (bgs) in the vicinity of the retort building which showed mercury concentrations of 9.2 mg/kg to 38,000 mg/kg. The sample with the mercury highest concentration was collected from soil beneath a leaking pipe elbow below the mercury condensing tube. Elemental mercury was visible and estimated to be localized in an area of approximately 3 feet in diameter to a depth of 1.5 feet. Approximately 30 feet directly downgradient of the retort building, one (1) sample was collected from the top of the river bank and one from an adjacent location at the base of the river bank; the mercury concentrations in these samples were 2.8 mg/kg and 4.1 mg/kg, respectively. Four (4) sediment samples from the Wood River were collected; one of which contained mercury at a concentration of 0.77 mg/kg and three (3) which were non-detectable at a 0.3 mg/kg detection limit.

Also in October 1992, Greenpeace is said to have collected tissue from five (5) species of fish to be sampled for mercury. Results of these samples are not in the DEC files, and a letter from BLM states that Greenpeace would not release the sample results.

On December 21, 1992, DEC issued a Notice of Violation to the BLM citing high levels of mercury in the soils near the retort building, areas of petroleum hydrocarbon contamination in the soils, and an estimated 1150 gallons of bunker C and diesel in drums on site. DEC requested that site characterization and cleanup occur as well as the removal of the drums in order to prevent a release.

In April 1993, BLM forwarded a site characterization plan to DEC for approval. The workplan was approved by DEC in May 1993, but not implemented.

In October 1993, DEC and BLM staff visited the site to determine an acceptable location for placement of the drums. Seventeen drums were noted to be present, four (4) drums were leaking and one (1) had been shot and the contents leaked to within three (3) feet of the river. Tarps were deployed and the leaking drums secured. DEC collected another soil sample from beneath the retort elbow and BLM collected two (2) samples from an area believed to be outside of the retort facility area of impact. Results of these samples are unknown.

BLM completed a site assessment in August 1994 which showed elevated levels of mercury and diesel-range organics present at the site.

In September 1994, BLM conducted "site remediation and waste storage" activities at the site. A final report was not found in the DEC files, however documentation of the 1994 sample results was found in the 1998 emergency response workplan. In this action, BLM decommissioned the retort building, associated retort equipment and supplies and placed the material into 1-cubic yard (cy) plastic totes on-site. Mercury contaminated soil was excavated 1-3 feet bgs from below and around the retort building and was placed in plastic totes. Approximately 30 cy of petroleum and/or mercury contaminated soil were excavated and stockpiled on-site. Confirmation samples collected from the limits of the retort excavation (~55 feet by 75 feet) contained mercury at concentrations up to 97 mg/kg and diesel-range organics up to 5800 mg/kg. The totes of soil and building debris were stacked and secured within a fenced storage area.

Following the excavation and storage of these materials, BLM began to research the cost and feasibility of various means of treatment or disposal. In March 1995, BLM received a cost estimate of $8600 to remove the drums of Bunker C, and in May 1995, BLM received a cost estimate of $1.2 million for transportation and disposal of the mercury contaminated soil and debris at a mercury remediation facility in Ohio. BLM continued to research the possibilities of different portable on-site treatment facilities. Due to the remoteness of the site location, the quantity of contaminated material, and the duration of the proposed treatment times, none of these technologies were found to be more cost-efficient than off-site disposal.

In September 1995, BLM conducted site maintenance activities, including 1) identifying and storing an additional drum and associated petroleum contaminated soil; 2) installing warning

signs on the storage area fence and stockpile; 3) securing totes with rope; 4) stacking drums and covering them with 10-mil visqueen; and 5) covering stockpile with 10-mil visqueen.

In 1996, Clarence Wren of Dillingham, the last surviving partner of Red Top Mining Co., died. BLM placed a lien against his estate to recover past cleanup costs.

Following a joint site visit, in October 1997, DEC sent a second Notice of Violation to BLM for not addressing the soils in a timely manner. BLM stated that delay in disposal/treatment was the result of 1) incomplete plans for waste removal which resulted in inadequate funding available; 2) poor contractor performance; and 3) investigation of Potentially Responsible Party issues with Department of Interior and Department of Justice attorneys. In spring 1998, DEC and BLM met several times to discuss the site and cleanup alternatives.

On May 29, 1998, BLM notified DEC that high water levels of the Wood River had flooded the site. DEC and the United States Environmental Protection Agency (EPA) determined that an Emergency Response action was needed to move the totes. Increasing water levels prevented the relocation of the totes at that time, so sandbags were placed upstream of the totes which were also covered with plastic sheeting. A new cover liner was placed over the diesel-range organics stockpile as well. Characterization samples were collected from 74 totes and from three (3) locations in the stockpile. A total of 178 totes were stored on-site, many of which were partially submerged by the flood waters of the Wood River.

In 1998, BLM conducted two rounds of sampling to determine potential impacts to the Wood River from the contamination at the site. During the July flood-stage of the river, collocated sediment and surface water samples were collected upstream, downstream, and near the tote storage area for and analyzed for total mercury. Mercury analytical results were non-detect for all of the surface water samples and up to 0.650 mg/kg for the sediment samples. Collocated sediment and surface water samples were collected upstream and downstream of the petroleum soil stockpile and analyzed for diesel-range organics, benzene, toluene, ethylbenzene, and xylenes. Analytical results were non-detect for all of the surface water samples with the exception of a slight benzene detection downgradient of the stockpile and a slight xylenes detection in the area of the 1994 excavation; concentrations of diesel-range organics up to 42.6 mg/kg were measured in the sediments. These sediment samples were termed such due to the fact that the river had flooded that area and the soils were in contact with ambient water at that time; however the river is not normally in this area. Comparison of these analytical results to surface water and sediment screening values was appropriate for the time period when the water level was raised, but would be inappropriate for determining current impacts to ecological community in the Wood River.

In September, six (6) additional sediment samples were collected from the Wood River; five (5) were collected by wading in the river and one (1) from in a boat located approximately 108 feet from shore. The analytical results showed mercury at concentrations of 0.067 mg/kg upgradient of the site, 0.197 mg/kg with a 0.458 mg/kg duplicate adjacent to the 1994 excavation area; 0.044 mg/kg approximately 500 feet downstream; and 0.085 mg/kg another 500 feet downstream; and 0.125 at a location 108 feet from shore across from the 1994 excavation area.

BLM also collected one (1) soil samples from an area believed to be unaffected by the mining activities in order to determine site specific background concentrations. The mercury analytical result of this sample was non-detect, with a detection limit of 0.0297 mg/kg.

BLM attempted to reestablish the limits of the previous excavation and determine those sampling locations. The backfill was removed and the liner placed in the bottom of the excavation in 1994 was located. The dimensions of the excavation did not correspond with those documented in the 1995 report, thus the sample locations could not be accurately reestablished. BLM excavated a total of nine (9) cy of mercury contaminated soil from three (3) separate locations and collected 26 characterization and confirmation samples. The excavation was conducted in areas where previous sample results were the highest. Characterization and confirmation sample results showed mercury to be present in concentrations up to 40.6 mg/kg in the excavation area and 0.483 outside the excavation boundaries. These samples were not analyzed for diesel-range organics; however, the area the highest detected contamination from 1994 was excavated. Additional liner was placed in the excavation in areas where the previous liner was damaged and the hole was backfilled with clean fill and regraded. Two confirmation samples collected around the petroleum contaminated soil stockpile contained diesel-range organics up to 26.8 mg/kg.

BLM removed the 178 totes of contaminated soil and disposed of 176 totes at Oregon Waste Systems' Columbia Ridge Solid Waste Landfill in Arlington, Oregon and two (2) totes at Mercury Waste Solutions in Union Grove, Wisconsin. Also sent to the Columbia Ridge Solid Waste Landfill were 69 supersacks of soil contaminated with diesel-range organics and/or mercury.

In 1999, BLM collected soil samples at the site directly under the liner and also slightly deeper at the same location in order to determine the extent of mercury left in place. Samples were also collected outside of the former excavation area. The highest concentrations of mercury found were 108 mg/kg at 2' bgs directly under the liner, 2.4 mg/kg at about 5' bgs, and 12 mg/kg at 1' bgs outside of the former excavation area.

COMPLETED ROUTES OF EXPOSURE

Human Health

Current-Use Exposure Pathways: The remaining mercury-contaminated soil is located approximately 3' bgs and is covered by a liner and clean backfill. Potential current receptors include adult and child recreational users and trespassers. The closest populations are Dillingham (2200 persons) and Aleknagik (250 persons). Due to the presence of the liner and clean backfill covering the contamination at depth, the inhalation, ingestion, and dermal contact exposure pathways are not complete at this time. Groundwater has been found at depths of 1.5-3' bgs and at times is at the ground surface when the river floods. The closest residence to the site is located on a native allotment ½ mile away. There are currently no residences or wells and groundwater is not used for drinking water, thus groundwater ingestion is not currently a completed pathway.

Other human health exposure pathways investigated include mercury migration to the Wood River, direct contact with sediment and surface waters, and consumption of fish containing

elevated levels of mercury. These pathways have been shown not to be complete at this time. The site is located approximately 30' from the Wood River and 3-4' higher in elevation. The Wood River is approximately 500' wide with a flat gradient.
Future-Use Exposure Pathways: Future human health exposure pathways to the site contaminants are the same as the current pathways as long as the liner remains in place and no digging is performed in this area.

Future use and potential ownership of the site are unknown. Institutional controls (land use controls) are needed to help ensure contaminant exposure pathways that are currently incomplete remain so in the future or that additional characterization or cleanup, as appropriate, are undertaken.

Ecological
Current-Use Exposure Pathways: There are no completed exposure pathways for terrestrial receptors as the residual contamination is located at depth below a liner and clean backfill.

The Wood River is a world-class fishery with the largest sockeye salmon run in Alaska and Dillingham has one of the largest fishing fleets in the state. Migration of contamination to the Wood River is not considered a completed pathway based upon an October 1994 study of slimy sculpins. By using minnow traps, 15 sculpin and 2 coho were collected from the Wood River, three (3) sculpin and 3 coho from Arcana Creek near the mine, and 1 sculpin and 3 coho from Squaw Creek in Dillingham (control site). Sculpins are bottom-dwelling insectivores sedentary fish that do not migrate and therefore were considered appropriate for this study. The coho salmon fry had not yet migrated but were less desirable due to the young age and small size of the fish. Mercury concentrations in the sculpins and coho in the Wood River ranged from 0.01-0.12 mg/kg and 0.03-0.08 mg/kg, respectively; and in sculpins and coho in Arcana Creek ranged from 0.02-0.06 mg/kg and 0.06-0.08 mg/kg, respectively. These concentrations are very comparable to those found in sculpins and coho control samples from Squaw Creek, specifically 0.1 mg/kg and 0.03-0.06 mg/kg, respectively. EPA Region 3 has developed a risk-based concentration of mercury for fish ingestion of 0.41 mg/kg.

CLEANUP LEVELS

Soil
Site specific cleanup levels haven't been developed for this site. A preliminary soil removal action objective of 23 mg/kg mercury, based on the US EPA risk-based concentrations, was used in 1994. DEC regulations in 18 AAC 75.341 are a bit more stringent with 1.24 mg/kg for the migration to groundwater pathway and 13 mg/kg for the inhalation pathway for mercury. Sample results from 1999 contained a maximum mercury concentration of 108 mg/kg in a sample collected below the liner. Characterization samples collected outside of the excavation area and liner showed a contained a maximum mercury concentration of 12 mg/kg. A statistical analysis of 44 sample results covering approximately 3800 square feet indicated a 95-percent confidence interval from 0.126 to 10.81 mg/kg.

Sediment
Sediment samples from the Wood River collected in 1998 showed an upgradient concentration of 0.197 mg/kg and a high of 0.458 adjacent to the retort building excavation. DEC has not

promulgated sediment cleanup levels, but uses screening values set by the National Oceanic and Atmospheric Administration (NOAA) or other generally-accepted state or federal screening values. For freshwater sediment, the NOAA Threshold Effects Level (TEL) is set at 0.174 mg/kg and the Probable Effects Level (PEL) is 0.486 mg/kg. The TEL represents a concentration below which adverse effects are rarely expected to occur. The PEL is a level above which adverse effects are frequently expected.

Surface Water

Alaska Water-Quality Standards of 18 AAC 70 include aquatic life criteria for mercury in fresh waters of 0.012 micrograms per liter (ug/L) (chronic) and 2.4 ug/L (acute). Surface water samples were collected from the Wood River in 1998 when it flooded the site. All six (6) samples were non-detect for mercury.

Groundwater

No groundwater characterization has been conducted. Sediment and surface water samples collected from the Wood River, approximately 30 feet down-gradient from the excavation, do not indicate significant subsurface contaminant transport to the river.

CONCLUSIONS

Site specific cleanup levels have not been established for this site. There is a small volume of mercury contaminated soil remaining at ~3' bgs under a liner which was placed at the excavation limits. This mercury contamination exceeds DEC's default cleanup levels for residential use. The site is currently not used for residential or commercial/industrial purposes. The limited site characterization results available at this time indicate remaining contaminants are not adversely affecting nearby surface water, sediments or fish. Therefore, additional cleanup actions do not appear necessary at this time. However, prior to concurring with a conditional closure, DEC requests BLM:

1. Provide for future protection of human health and the environment by establishing institutional controls on this site to: a) document the location and depth of residual contamination and the liner; b) restrict digging in the area of residual contamination; and c) restrict future residential use of the site around the former retort building excavation area where residual contamination exists.
2. Evaluate and provide information on the potential for erosion of the site due to river currents and flooding and, as necessary, include future inspections in the institutional controls noted above.
3. Provide more information to demonstrate whether groundwater contamination has occurred that may pose an unacceptable risk to human health or ecological receptors in Wood River.
4. Provide information on the volume, location and chemical makeup of waste rock and processed ore from the retort operations.
5. Provide clarification on current land ownership, and possible future conveyance, of the site. Any future land transfer should include disclosure of information on environmental contamination, site characterization and cleanup efforts to date, residual contamination and institutional controls as described above.

6. After addressing the items above, provide public notice to interested parties as agreed to in the 2002 BLM and DEC cost recovery settlement agreement for the Red Top Retort site.

We look forward to working with you on these remaining issues in order to achieve conditional closure on this site. Please feel free to contact me at 269-7545 or Anne Marie Palmieri, of my staff, at 766-3184.

Sincerely,

John Halverson
Environmental Program Manager

cc: Anne Marie Palmieri

SGS Environmental Services
Alaska Division
Level II Laboratory Data Report

Project:	Red Top Mill
Client:	Shannon & Wilson-Fairbanks
SGS Work Order:	1074363

Released by:

Contents:

Cover Page
Case Narrative
Final Report Pages
Quality Control Summary Forms
Chain of Custody/Sample Receipt Forms

Note:
Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the standards set forth by the proper regulatory authority, the SGS Quality Assurance Program Plan, and the National Environmental Accreditation Conference.

SGS

Case Narrative

Client	SHANFBK	Shannon & Wilson-Fairbanks	**Printed Date/Time**	9/11/2007	8:52
Workorder	1074363	Red Top Mill			

Sample ID	**Client Sample ID**

Refer to the sample receipt form for information on sample condition.

Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.us.sgs.com

Mark Lockwood
Shannon & Wilson-Fairbanks
2355 Hill Rd
Fairbanks, AK 99709

Work Order:	1074363	
	Red Top Mill	**Released by:**
Client:	Shannon & Wilson-Fairbanks	
Report Date:	September 11, 2007	

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by SGS. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request.

The laboratory certification numbers are AK971-05 (DW), UST-005 (CS) and AK00971 (Micro) for ADEC and 001828 for NELAP (RCRA methods: 1010/1020, 1311, 6000/7000, 9040/9045, 9056, 9060, 9065, 8015B, 8021B, 8081A/8082, 8260B, 8270C).

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP, the National Environmental Laboratory Accreditation Program and, when applicable, other regulatory authorities.

If you have any questions regarding this report or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343.

The following descriptors may be found on your report which will serve to further qualify the data.

PQL	Practical Quantitation Limit (reporting limit).
U	Indicates the analyte was analyzed for but not detected.
F	Indicates value that is greater than or equal to the MDL.
J	The quantitation is an estimation.
ND	Indicates the analyte is not detected.
B	Indicates the analyte is found in a blank associated with the sample.
*	The analyte has exceeded allowable regulatory or control limits.
GT	Greater Than
D	The analyte concentration is the result of a dilution.
LT	Less Than
!	Surrogate out of control limits.
Q	QC parameter out of acceptance range.
M	A matrix effect was present.
JL	The analyte was positively identified, but the quantitation is a low estimation.
E	The analyte result is above the calibrated range.

Note: Soil samples are reported on a dry weight basis unless otherwise specified.

SGS

SGS Ref.#	1074363001	**All Dates/Times are Alaska Standard Time**	
Client Name	Shannon & Wilson-Fairbanks	**Printed Date/Time**	09/11/2007 8:52
Project Name/#	Red Top Mill	**Collected Date/Time**	08/22/2007 15:25
Client Sample ID	1361-082207-WP07-1	**Received Date/Time**	08/24/2007 15:28
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	A		09/07/07	09/07/07	AFH

SGS

SGS Ref.#	1074363003	**All Dates/Times are Alaska Standard Time**	
Client Name	Shannon & Wilson-Fairbanks	**Printed Date/Time**	09/11/2007 8:52
Project Name/#	Red Top Mill	**Collected Date/Time**	08/22/2007 16:20
Client Sample ID	1361-082207-WP07-2	**Received Date/Time**	08/24/2007 15:28
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	A		09/07/07	09/07/07	AFH

SGS

SGS Ref.#	1074363005	**All Dates/Times are Alaska Standard Time**	
Client Name	Shannon & Wilson-Fairbanks	**Printed Date/Time**	09/11/2007 8:52
Project Name/#	Red Top Mill	**Collected Date/Time**	08/22/2007 17:00
Client Sample ID	1361-082207-WP07-3	**Received Date/Time**	08/24/2007 15:28
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	A		09/07/07	09/07/07	AFH

SGS

SGS Ref.#	1074363007	**All Dates/Times are Alaska Standard Time**	
Client Name	Shannon & Wilson-Fairbanks	**Printed Date/Time**	09/11/2007 8:52
Project Name/#	Red Top Mill	**Collected Date/Time**	08/22/2007 16:30
Client Sample ID	1361-082207-WP07-4	**Received Date/Time**	08/24/2007 15:28
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	A		09/07/07	09/07/07	AFH

SGS

SGS Ref.#	789443 Method Blank		**Printed Date/Time**		09/11/2007 8:52
Client Name	Shannon & Wilson-Fairbanks		**Prep**	**Batch**	MXX19462
Project Name/#	Red Top Mill			**Method**	METHOD
Matrix	Water (Surface, Eff., Ground)			**Date**	09/07/2007

QC results affect the following production samples:

1074363001, 1074363003, 1074363005, 1074363007

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Metals Department					
Mercury	ND	0.200	0.0620	ug/L	09/07/07
Batch MCV3708					
Method SW7470A/E245.1					
Instrument PSA Millennium mercury AA					

SGS

SGS Ref.#	1074363007	**All Dates/Times are Alaska Standard Time**	
Client Name	Shannon & Wilson-Fairbanks	**Printed Date/Time**	09/11/2007 8:52
Project Name/#	Red Top Mill	**Collected Date/Time**	08/22/2007 16:30
Client Sample ID	1361-082207-WP07-4	**Received Date/Time**	08/24/2007 15:28
Matrix	Water (Surface, Eff., Ground)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	PQL	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	ND	0.200	ug/L	SW7470A/E245.1	A		09/07/07	09/07/07	AFH

SGS Ref.#	789443	Method Blank	**Printed Date/Time**		09/11/2007 8:52
Client Name	Shannon & Wilson-Fairbanks		**Prep**	**Batch**	MXX19462
Project Name/#	Red Top Mill			**Method**	METHOD
Matrix	Water (Surface, Eff., Ground)			**Date**	09/07/2007

QC results affect the following production samples:

1074363001, 1074363003, 1074363005, 1074363007

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Metals Department					
Mercury	ND	0.200	0.0620	ug/L	09/07/07
Batch MCV3708					
Method SW7470A/E245.1					
Instrument PSA Millennium mercury AA					

SGS Ref.#	789444 Lab Control Sample	**Printed Date/Time**		09/11/2007	8:52
		Prep	**Batch**	MXX19462	
Client Name	Shannon & Wilson-Fairbanks		**Method**	METHOD	
Project Name/#	Red Top Mill		**Date**	09/07/2007	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1074363001, 1074363003, 1074363005, 1074363007

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Metals Department								
Mercury	LCS	3.99	100	(85-115)			4 ug/L	09/07/2007

Batch MCV3708
Method SW7470A/E245.1
Instrument PSA Millennium mercury AA

SGS

SGS Ref.#	789445	Matrix Spike	**Printed Date/Time**		09/11/2007 8:52
	789446	Matrix Spike Duplicate	**Prep**	**Batch**	MXX19462
				Method	Digestion Mercury (W)
				Date	09/07/2007
Original	1074462001				
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:
1074363001, 1074363003, 1074363005, 1074363007

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Metals Department										
Mercury		MS	ND	8.12	101	(85-115)			8	ug/L 09/07/2007
		MSD		7.89	99		3	(< 15)	8	ug/L 09/07/2007

Batch	MCV3708
Method	SW7470A/E245.1
Instrument	PSA Millennium mercury AA

SGS

CHAIN OF CUSTODY RECORD
SGS Environmental Services Inc.

1074363

ide
Hawaii
Maryland
North Carolina

071621

(1)

CLIENT: Shannon & Wilson, Inc Fairbanks
CONTACT: MARK Lockwood PHONE NO: 907 479-0600
PROJECT: RED TOP MILL SITE/PWSID#:
REPORTS TO: 2355 Hill Rd Fairbanks AK 99709 E-MAIL: MSL@shanwil.com FAX NO.: (907) 479 5691
INVOICE TO: same QUOTE #
P.O. NUMBER

SGS Reference:

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C= COMP, G= GRAB)	Preservatives Used: None	Analysis Required (3): Hg by EPA 7470A	REMARKS
A	1361-082207-WP07-1	8/22/07	15:25	W	1	G		X	
	1361-082207-WP07-1F		15:25		1			X	HOLD*
	1361-082207-WP07-2		16:20		1			X	
	1361-082207-WP07-2F		16:20		1			X	HOLD
	1361-082207-WP07-3		17:00		1			X	
	1361-082207-WP07-3F		17:00		1			X	HOLD
	1361-082207-WP07-4		16:30		1			X	
	1361-082207-WP07-4F		16:30		1			X	HOLD

Please acidify upon receipt

(5)

Collected/Relinquished By: (1)	Date	Time	Received By:	Date	Time
MARK Lockwood	8-24-07	8:00a			
Relinquished By: (2)	Date	Time	Received By:	Date	Time
Relinquished By: (3)	Date	Time	Received By:	Date	Time
Relinquished By: (4)	Date	Time	Received By:	Date	Time
				8/24/07	1528

(4)

Shipping Carrier:
Shipping Ticket No:
Samples Received Cold? (Circle) YES NO
Temperature (C: TB = 4.5 ; C = 4.1
Special Deliverable Requirements:
Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT
Special Instructions: *= HOLD these (4) samples pending results of other four.
Requested Turnaround Time:
☐ RUSH _____ Date Needed ☒ STD

1074363

SGS

SAMPLE RECEIPT FORM

SGS WO#:

Yes	No	NA	
	✓		Are samples **RUSH**, priority, or *w/n 72 hrs.* of **hold time**?
		✓	If yes have you done *e-mail notification*?
	✓		Are samples *within 24 hrs.* of **hold time** or **due date**?
		✓	If yes, have you *spoken with* Supervisor?
		✓	Archiving bottles – if req., are they properly marked?
✓			Are there any **problems**? PM Notified?
	✓		Were samples preserved correctly and pH verified?
			If this is for PWS, provide **PWSID.**
			Will courier charges apply?
			Method of payment?
			Data package required? (Level: 1 / 2 / 3 / 4)
			Notes:
			Is this a DoD project? (USACE, Navy, AFCEE)

Samples not preserved

Due Date: 9/10/07
Received Date: 8/24/07
Received Time: 1528
Is **date/time conversion** necessary? —
# of hours to AK Local Time: —
Thermometer ID:

Cooler ID	Temp Blank	Cooler Temp
	°C	°C
	°C	°C
	°C	°C
	°C	°C
	°C	°C

*Temperature readings include thermometer correction factors

Delivery method (circle all that apply): Client / Alert Courier / UPS / FedEx / USPS / AA Goldstreak / NAC / ERA / PenAir / Carlile Lynden / SGS / Other:

Airbill #

Additional Sample Remarks: (√ *if applicable*)
- Extra Sample Volume?
- Limited Sample Volume?
- Field preserved for volatiles?
- Field-filtered for dissolved?
- Lab-filtered for dissolved?
- Ref Lab required?
- Foreign Soil?

This section must be filled out for DoD projects (USACE, Navy, AFCEE)

Yes	No	
		Is received temperature 4 ± 2°C?
		Rad Screen performed? Result:
		Was there an airbill? *(Note # above in the right hand column)*
		Was cooler sealed with custody seals?
		# / where:
		Were seal(s) intact upon arrival?
		Was there a COC with cooler?
		Was COC sealed in plastic bag & taped inside lid of cooler?
		Was the COC filled out properly?
		Did the COC indicate COE / AFCEE / Navy project?
		Did the COC and samples correspond?
		Were all sample packed to prevent breakage?
		Packing material:
		Were all samples unbroken and clearly labeled?
		Were all samples sealed in separate plastic bags?
		Were all VOCs free of headspace and/or MeOH preserved?
		Were correct container / sample sizes submitted?
		Is sample condition good?
		Was copy of CoC, SRF, and custody seals given to PM to fax?

Exceptions: Samples/Analyses Affected:

This section must be filled if problems are found.

Yes	No	
		Was client notified of problems?

Individual contacted:
Via: Phone / Fax / Email (*circle one*)
Date/Time:
Reason for contact:

Change Order Required?
SGS Contact:

Notes: Samples preserved in lab 8/24/07 1610 BWE

Completed by (sign): [signature] **(print):** Briana D. Edgington

Login proof (check one): waived ____ required ____ performed by:

SGS

1074363

SAMPLE RECEIPT FORM (page 2)

SGS WO#:

#	Container ID	Matrix	Test	QC	TB	Container Volume: 1 L	500 mL	250 mL	125 mL	60 mL	40 mL	8oz (250 mL)	4oz (125 mL)	Other	Container Type: AG	CG	HDPE	Nalgene	Cubie	Coli	Septa	Other	Preservative: None	HCl	HNO_3	H_2SO_4	MeOH	$Na_2S_2O_3$	NaOH	Other
1,3,5 7	A	1	Hg					4									✓							✓						
2,4,6 8	A	1	Hold (Hg)					4									✓							✓						
Bottle Totals								8																						

Completed by: [signature] Date: 8/24/07

027 DLG 3310 4960

027-3310 4960

Not Negotiable

Air Waybill

Issued By

Alaska Air Cargo

ALASKA AIRLINES & HORIZON AIR

P.O. BOX 68900 SEATTLE, WA 98168
800-225-2752 ALASKACARGO.COM

1074363

Shipper's Name and Address
SHANNON AND WILSON
2055 HILL ROAD
FAIRBANKS, AK 99709-5244
USA
Tel:

Shipper's Account Number: 27400200733

Customer's ID Number: 10926

Consignee's Name and Address
SGS Environmental Servic
200 W Potter Dr.
Anchorage, AK 99518
USA
Tel: 907-562-2343

Consignee's Account Number

C

Also notify: 8/24 HOO ADV

Tel:

Issuing Carrier's Agent and City

Accounting Information

GoldStreak

Joe Howell

Agent's IATA Code

Account No.

Airport of Departure (Addr. of First Carrier) and Requested Routing
Dillingham

To	By First Carrier	To / By	To / By	Currency		WT/VAL	Other	Declared Value For Carriage	Declared Value For Customs
ANC	Alaska Airlines			USD	PX	X	X	NVD	NCV

Airport of Destination	Flight/Date	Flight/Date	Amount of Insurance
Anchorage	AS 133/24		XXX

Handling Information

SCI

No of Places	Gross Weight	kg lb	Commodity Item No.	Chargeable Weight	Rate / Charge	Total	Nature and Quantity of Goods (Incl. Dimensions or Volume)
1	21.0	L		21.0		AS AGREED	WATER SAMPLES
							GSX
1	21.0					AS AGREED	Volume: 0.095

Prepaid — Weight Charge — Collect

AS AGREED

Valuation Charge

Tax

Total Other Charges Due Agent

Total Other Charges Due Carrier

Other Charges
MYC 2.10

Shipper certifies that the particulars on the face hereof are correct and that insofar as any part of the consignment contains dangerous goods, such part is properly described by name and is in proper condition for carriage by air according to the applicable Dangerous Goods Regulations. I consent to the inspection of this cargo.

For: SHANNON AND WILSON FAI

Signature of Shipper or his Agent

[N] THIS SHIPMENT DOES NOT CONTAIN DANGEROUS GOODS

[ ] THIS SHIPMENT DOES CONTAIN DANGEROUS GOODS

Total Prepaid	Total Collect
AS AGREED	

24 Aug 2007 10:39 — Executed On (Date)

Dillingham — at (Place)

Alaska Airlines — Signature of Issuing Carrier or its Agent

027-3310 4960

SGS Environmental

CUSTODY SEAL

Signature:

Date/Time: 8-24-07

SGS Environmental

CUSTODY SEAL

Signature:

Date/Time: 8-24-07

1074363

Alert Expeditors Inc.
DBA/Petroleum Courier Service

182540

Citywide Delivery
272-0349 • 440-3351
8421 Flamingo Drive • Anchorage, Alaska 99502

Date

From

To

Collect ☐	Prepay ☐ Account ☐	Advance Charges ☐
Job #	PO#	

1074363

Shipped Signature

Received By