Attachment E: Contaminated Substances Discovery Plan

Pacific Connector GAS PIPELINE

Pacific Connector Gas Pipeline, LP

Contaminated Substances Discovery Plan

Pacific Connector Gas Pipeline Project

(During the previous NEPA process, PCGP submitted a Plan of Development to meet BLM Right-of-Way Grant requirements based on BLM regulations. These plans will be updated in consultation with the Federal land managing agencies [BLM, USFS, and Reclamation] during the current NEPA process.).

October 2017

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Contaminated Substances Discovery Plan

1.0 INTRODUCTION

The intent of this Contaminated Substances Discovery Plan is to outline practices to protect human health and worker safety and to prevent further contamination in the event of an unanticipated discovery of contaminated soil, water, or groundwater during construction of the Pacific Connector Gas Pipeline Project (Pipeline).

2.0 SITES WITHIN CONSTRUCTION AREAS

Pacific Connector Gas Pipeline, LP (PCGP) completed a review of the Oregon Department of Environmental Quality (ODEQ) Environmental Cleanup Site Information Database (ECSI) to assess the presence of known or potential contamination from either Landfills or Hazardous Waste Sites. Several sites have been identified as potentially occurring within the Pipeline construction area. These sites are primarily within proposed pipe yards, which are often located in disturbed/vacant industrial sites, many of which were former lumber mills or log storage yards. Use of pipe yards would not involve excavation or other activities that would interact with contaminated areas. The Jordan Cove Meter Station (MP 0.00) is the only location associated with the Pipeline where excavation would have the potential of encountering known contamination.

2.1 MPs 0.0 to 0.14 Construction Right-of-Way and TEWAS 0.01-W and 0.01-N

At the Jordan Cove Meter Station (MP 0.00), the Pipeline is approximately 0.2 mile south of the Weyerhaeuser North Spit Landfill LUST (leaking underground storage tank) site (site id [log number] 06-89-0061) and ECSI site 1083; this is the same site as the Weyerhaeuser Containerboard/Mill property. ODEQ records indicate that the permitted landfill cells and settling basins have leaked over time contributing to a localized area of groundwater contamination. Petroleum hydrocarbons are present in subsurface soils and groundwater from these past mill operations/practices. These contaminants primarily consist of petroleum constituents from fuel, fuel oil, lubricants, solvents, and hydraulic oil. The extent of the hydrocarbon removal will be based on final structural fill/soil improvement requirements and subject to ODEQ approval (JCEP 2017). In 2003, Weyerhaeuser shut down the mill and cleanup was reviewed by the ODEQ. It was determined that no further action was deemed necessary at this site. Fort Chicago Holdings II U.S. LLC purchased the Weyerhaeuser parcel in 2012. Milepost 0.00 and the Jordan Cove Meter Station are approximately 980 feet south of the estimated center-point of the mill area.

Based on available information (Delta Environmental 2006; JCEP 2017), the southern portion of Jordan Point was formerly used as a disposal area for mill-related fill and construction debris. This area is presently an open field vegetated with grasses and small shrubs. These activities were conducted for a period of approximately five to ten years during the 1960s and ceased by approximately 1970. According to the previous site investigations and studies, it appears that fill was primarily concentrated in a former ditch and low-lying area in the general area of about MPs 0.12 and 0.20. According to previous site investigations and studies, fill consisted of metal plates and scrap, wire, and discarded building materials, including asbestos-containing transite siding. The transite siding consisted of “scrap” pieces of siding, such as cutouts for piping that were derived from the installation of transite siding on buildings (primarily at the mill/paper machine building) at the site. Therefore, pieces of transite siding in the fill/debris are relatively small, and the overall volume is thought to be limited (Delta Environmental 2006).

As excavation and other construction activities occur in this location, PCGP would adhere to the Human Health, Worker Safety, and Environmental Protection guidelines (see Section 4.0 below), and would coordinate activities with ODEQ in this area.

2.2 K-2 Pipe Yard

At the proposed K-2 Pipe Yard, ECSI site 527 is associated with the Weyerhaeuser Expert Services location. The site was historically developed for use as a lumberyard in the 1880's. Since then, it has been used for sawmill/timber related uses. Weyerhaeuser developed the property in 1950 for lumber export services operations. Weyerhaeuser operations included a sawmill, a planer building, a green sort building, a green chain, a machine shop, a paint shop, and a powerhouse. Finished wood products were treated with pentachlorophenol in the green sort building area prior to being packaged and exported. There was a pentachlorophenol spill on March 24, 1984. There was also an approximate 1,000-gallon spill of NP-1 anti-sapstain in March 1987. Contamination in this area is approximately 8 feet below the ground surface, and is currently capped with asphalt. In January 2009, ODEQ selected leaving the contamination in place, but required that the cap remain intact and that a plan be developed to guide future developers on how to manage the soils in the unlikely event that the soils were ever disturbed. The plan was developed and is referenced in a deed restriction on the property that will apply to the current owner and any future owner of the property. ODEQ issued a conditional no further action letter on July 14, 2009.

This site has been capped and use of the site with a condition of no excavation is consistent with the current status of the remedial action guidance. There is no risk of impact based on the proposed surface use of this area as a pipe yard.

2.3 Brunell Pipe Yard

In this proposed yard, Champion International LUST site (06-90-0009) was a diesel spill in 1990 and was remediated the same year; the log file has been closed. Also in the pipe yard is Central Dock Company LUST site (06-93-0042). This was a leaded gas spill in 1993 that contaminated soil, groundwater, surface water, and drinking water. The site was cleaned up and remediated the same year, and the log file has been closed. The third site is the Central Dock site (ECSI 4646) location, which was a Standard Oil and Union Oil petroleum, product-related warehouse facility dating from at least 1911 through approximately 1945. From 1945 to 1993, the property was used for log and lumber storage, handling, and shipping. From 1993 to 1996, Hall-Buck Marine, Inc. operated a copper ore concentrate handling and shipping facility on the property. The property has been vacant since 1996. Soil, sediments, and/or groundwater at or near the property have been contaminated by petroleum compounds and/or metals, primarily arsenic and copper. Remediation was to include capping the entire upland property and implementing institutional controls (no excavation, groundwater extraction, etc.). While portions of the area have been capped, aerial photography shows that some areas have not been capped.

PCGP believes that there is no risk of impact based on the proposed surface use of this area as a pipe yard.

2.4 Coquille Yard

PCGP reviewed the information for the Georgia Pacific Mill site (ECSI 1255) within this yard. Testing of the site in 1992 indicated selected areas had long-chain hydrocarbon contamination in the south conveyor tail drum area, around the north lathe bases and in one area of the south lathe bases, in the vicinity of the press pits, and areas of drum and hydraulic oil tank storage. A subsequent 1994 report for the former LUST area identified benzene and xylenes in the groundwater, found asbestos in on-site debris piles, and detected polychlorinated biphenyls (PCBs) in soils at a transformer area. A work plan for the site by the City of Coquille (site owner) was approved by ODEQ in 1994, and sampling and remediation were conducted in 1995. Contaminated soil was removed and treated in a soil treatment area and the site was encapsulated with fill dirt from ODOT. In 1998 the ODEQ recommended No Further Action for the site.

This site has been remediated, and use of the site with a condition of no excavation is consistent with the current status of the remedial action guidance. There is no risk of impact from use as a pipe yard.

2.5 Millington 1 Pipe Yard

At this location, there is one LUST site (06-98-0036) at the edge of the pipe yard. This site had a reported spill of diesel that contaminated soils and groundwater in 1998. This site has been remediated and the log file has been closed. There is no risk from use as a pipe yard.

2.6 Winchester Pipe Yard

This was the location of the former Winchester Mill (ECSI 4441). Contaminants at the site include carbon tetrachloride, trichloroethylene, perchloroethylene, and 1, 2-Dichloroethane located within the old log pond soils. As these contaminants are in the old log pond, and this pond area would not be disturbed by use as a pipe yard, there would be no impact.

2.7 Hult Chip Yard 2

There is one LUST site within the proposed pipe yard. Reporting shows the site had spilled waste oil. This site was remediated in 1991 and the site closed out. As no excavation would occur from use as a pipe yard, there would be no impact.

3.0 SITES IN PROXIMITY TO PIPELINE PROJECT AREA

ODEQ’s Potential Contaminated Sites (PCS) database (ODEQ 2017) was reviewed for PCS sites that are located within 200 feet of proposed construction disturbance and associated facilities. These sites were queried by PCGP in response to a FERC request, but these sites are not in proximity to the Pipeline, and there are no anticipated impacts.

3.1 Menasha Pipe Yard

At this location, LUST site 06-98-0006 occurs at the edge of the pipe yard. A leaking diesel tank was recorded, and cleanup was completed in 1998. No further action is required.

The Chambers Fuel Oil Inc. (ECSI 22) operated as a heating oil storage and distribution facility from 1954 to 1988 at the south end of the proposed pipe yard. At the end of facility operation in 1988, ODEQ's Southwest Region office required Chambers to empty its tanks and remove on-site asbestos. Coos County assumed ownership in 1990 due to tax default. ODEQ's Site Assessment program completed a Preliminary Assessment at the site in 1991 and concluded that further investigation was required. ODEQ conducted a Site Investigation and Removal Assessment in early 1994 that confirmed oil contamination in the soil and groundwater. A security fence was installed around the site in June 1994, and ODEQ removed some drums from the site in November 1994. Over 300 tons of soil contaminated with total petroleum hydrocarbons (TPH) and 80,000 gallons of contaminated groundwater were removed in 1997. The site was then backfilled with clean sand and regraded and is considered remediated. There would be no excavation at the pipe yard, and there is no impact anticipated at this location.

Ninety feet south of the Menasha Pipe Yard, there is one LUST site (06-16-1330). A leaking tank with miscellaneous petroleum (gas) products was recorded at this location, and cleanup is still underway. No further action is required for this location given the distance from the pipe yard.

3.2 K-2 Pipe Yard

Approximately 30 to 150 feet north of the K-2 Pipe Yard is the KO-KWEL Wharf Development sites (LUST 06-06-1367 and ECSI 4802). Contaminants include polycyclic aromatic hydrocarbons (PAH), trace metals, and other diesel and heavy-oil range petroleum hydrocarbons. Potential exposure pathways evaluated in the site risk assessment included occupational (indoor), construction, and excavation worker exposures to site soils and groundwater. A final report received on May 14, 2007 summarized the results of four separate site investigations in which more than 250 soil, groundwater, and sediment samples were collected. The report also included a comparison of all site contaminant concentrations to relevant ODEQ risk-based screening standards. The report concluded that all identified contaminants were below ODEQ's levels of concern, and therefore no remedial actions, engineering controls, or institutional controls were necessary to protect human health or the environment. ODEQ concluded that based on the information presented to date, the KO-KWEL Wharf Development Project site is currently protective of public health and the environment and requires no further action. No impact is expected given the distance to the pipe yard.

3.3 TEWA 7.44-W

LUST site 06-10-0979, heating oil associated with a residential home, is approximately 160 feet from TEWA 7.44-W. This site was remediated and closed in 2010. No impact is expected based on the distance from the TEWA.

3.4 Coquille Yard

LUST site 06-90-0120 is approximately 148 feet north of the Coquille Yard. This location is associated with a Texaco gas station. Cleanup was completed in 2004, and no further action is required and no impact is anticipated.

3.5 Green #1 Pipe Yard

Horizon Auto Body & Glass ECSI sites 2287 and 1960 are approximately 125 feet south of the Green #1 Pipe Yard. This location had several cleanup issues: contaminated runoff from the vehicle wash bay; spillage from several open-top drums containing wash rack sludge; and leakage from several paint-related waste storage containers, including contamination by PAHs, metals, and VOCs. A site assessment completed in October 2014 and July 2015, showed low levels of petroleum contamination remaining in shallow soils (less than one foot deep) that appear to be mostly found between the two buildings. The contamination does not appear to have migrated off-site. The site and surrounding properties are used for commercial/industrial purposes. The area is supplied by a municipal water source. Based on the available information from ODEQ, Horizon Auto Body and Glass is currently protective of public health and the environment, and no impacts are anticipated given the distance from the pipe yard.

3.6 Green District Pipe Yard

LUST site 10-91-0075, associated with Granny's Hut gas station, is approximately 30 feet from the Green District Pipe Yard. Cleanup of this location was completed in 1998, and no impacts are anticipated given the distance from the pipe yard.

3.7 Weaver Highway 99

LUST site 10-10-0244 is approximately 127 feet north of the Highway 99 Hay Field Pipe Yard. This location is associated with the Freeway Chevron gas station. There was physical damage to a diesel tank in 2010, and no further information is available for this location. Given the distance to the pipe yard, and location of the LUST, no impacts are anticipated.

3.8 Riddle Pasture and Riddle Main Street Pipe Yards

ECSI site 2250 is approximately 45 feet east of the proposed Riddle Pasture Yard, and the Tosco Bulk Plant is immediately adjacent to the pipe yard. The Tosco Bulk Plant No 0645 is approximately 80 feet from the Riddle Main Street Pipe Yard and includes ECSI Site 630 and LUST site 10-12-0517, which are associated with a Riddle Shell Gas Station LUST. The sites have contamination from BTEX and PAH in soils and groundwater. Site characterization and remediation are still underway; access to the pipe yards is expected to avoid these locations. No impacts are anticipated.

3.9 Thompson Mining Property

The USDA Forest Service has expressed concerns for the potential for naturally-occurring mercury to reach the aquatic environment during construction of the Pipeline near the historic Thomason mining property (near MP 109). The USDA Forest Service contracted with a geologist consultant to collect soil and stream sediment samples for analytical testing and reporting of mercury and other naturally-occurring minerals along a 2,000-foot section of the proposed route between MP 109 and the East Fork Cow Creek (see Attachment 1 – Potential for natural-occurring mercury mineralization to enter the aquatic environment between MP 109 and East Fork Cow Creek). Geochemical analysis of the soil and stream sediment samples have been determined to have very low to nominal concentrations of naturally-occurring mercury mineralization. The mercury level at one of the stream sediment sites was 0.29 ppm which was above the Level II screening level value of 0.1 ppm for invertebrates (ODEQ 1998). In order to prevent this naturally-occurring mercury from mobilizing during and after construction, additional erosion control measures and monitoring will be conducted at these sites. The report in Attachment 1 concludes that proposed pipeline construction activities by PCGP within the upper East Fork Cow Creek watershed are not anticipated to disturb and expose soils and bedrock strata that contains more than low amounts of natural-occurring mercury mineralization; and any sediment that is generated is not likely to reach the aquatic environment due to implementation of short-term and permanent mitigation measures outlined in PCGP's Erosion Control and Revegetation Plan and as listed in Attachment 1 of this plan.

4.0 HUMAN HEALTH, WORKER SAFETY, AND ENVIRONMENTAL PROTECTION

Of the sites investigated, the only known areas that may be impacted by grading/excavation activities are at the Jordan Cove location. This includes the right-of-way from MPs 0.00 to 0.14, Block Valve Assembly #1, and TEWAs 0.01-W and 0.01-N. At the Jordan Cove location, PCGP will follow the process of this Contaminated Substances Discovery Plan. Since the identified locations are known prior to construction, qualified PCGP staff or qualified contractor personnel will collect representative samples of the debris/fill for laboratory analysis as determined necessary by ODEQ based on the status of the site at the time of construction in the grading and excavation zone.

If contaminated materials are identified in laboratory analysis, the contaminated material will be removed and properly disposed of in accordance with appropriate federal and state regulations pertaining to asbestos containing waste. PCGP will utilize an environmental contractor with experience and expertise in contaminated media to characterize the excavation area. If necessary, the excavation area will also be prepared and excavated by a firm appropriately credentialed for the handling and management of asbestos or other hazardous materials. Where the removed fill must be stockpiled pending characterization or regulatory approval, PCGP will take precautions to isolate the substances (e.g., appropriate liner for storage area, berms, etc.). In addition, PCGP will ensure workers are trained in hazard control measures that will be used at the site (e.g., respirators, protective clothing, decontamination techniques, etc.; OSHA standards 29 CFR 1910) as required by pertinent worker safety regulations. If contaminated fill is encountered that requires off-site disposal at a licensed disposal site, the material will be handled, containerized and transported appropriately. Clean backfill will be utilized to backfill excavations. This approach is consistent with ODEQ recommendations for this general area (e.g., ODEQ - No Further Action Determination Letter, Former Weyerhaeuser Containerboard Mill North Bend, Coos County, Oregon Tax Lots #25S-13W-4-100, 25S-13W-3-200,).

PCGP will also include pipeline contractor training regarding site status and history and that excavation and disturbance is to be limited. No excavation will be allowed without PCGP's knowledge and approval.

Potential pipe yards would be used to store pipe, equipment, or other construction supplies and materials. Minor surface grading would be limited to pushing berms as needed to support pipe joints, or other shallow grading (< 1-foot of ground disturbance). Based on current documented conditions, PCGP does not believe that this limited use of these sites would result in a potential effect to human health, worker safety, or the environment. However, prior to use of these sites, PCGP will consult with ODEQ to confirm that the proposed use is consistent with those approved under the various assessments and determinations. If there is a concern, PCGP would bring in clean fill to create a lift of uncontaminated material on the surface area intended for use.

PCGP will include pipeline contractor training, per OSHA requirements, regarding anticipated site status and history and that site excavation and disturbance is to be limited. No excavation will be allowed without PCGP's knowledge and approval.

5.0 UNANTICIPATED CONTAMINATION

PCGP believes the potential for encountering unknown contamination has been minimized to the extent practicable. However, it is not possible to completely preclude this potential, especially considering private land sites may contain unreported contamination resulting from third-party activities.

Since not all potential occurrences or actions can be reasonably predicted, the overarching objectives of those actions taken when contaminated material, regardless of media, is discovered are to: (a) protect human health and the environment, (b) inhibit or prevent the further spread of contamination and (c) remediate the contamination to the extent practicable, within the constraints of (a) and (b). It should also be recognized that immediate actions in the field to protect workers may not be the alternative that is most protective of the environment. Each condition and situation would be viewed as a unique condition and evaluated individually.

In the event unanticipated contaminated soil, water and/or or groundwater is encountered during construction (i.e., discolored soils, soils or groundwater with hydrocarbon-type odors or other chemical odors, etc.), the following general procedures will be implemented:

1. All construction work in the immediate vicinity of areas where hazardous or unknown wastes are encountered will be halted.

2. All construction, oversight, and observing personnel will be evacuated to a road or other accessible up-wind location until the types and levels of potential contamination can be verified by qualified staff.

3. PCGP's Chief Inspector and Environmental Lead will be notified. Following consultation with on-site personnel, the Environmental Lead will be responsible for designating follow-up actions, including mobilizing emergency response personnel and coordinating with the EPA and/or state and local agencies as appropriate. In the event of a spill or to report an emergency, PCGP personnel will also contact the Oregon Emergency Response System at (800) 452-0311, who will then notify the appropriate response agencies. If old contamination is encountered in Coos, Douglas, or Jackson counties, PCGP personnel will contact Mike Kucinski (ODEQ Cleanup Manager) at (541) 687-7331. If old contamination is encountered in Klamath County, PCGP personnel will contact David Anderson (ODEQ Cleanup Manager) at (541) 633-2012. If old contamination is encountered on federal lands, PCGP personnel will contact the land managing agency's contact personnel as listed in Attachment A of PCGP's Spill Prevention, Containment, and Countermeasures (SPCC) Plan.

4. If an immediate or imminent threat to human health or the environment exists, one of PCGP's emergency response contractors identified in the SPCC Plan or the National Response Team will be notified and mobilized. If an immediate or imminent threat to human health or the environment does not exist, or has been abated, PCGP or qualified contractor personnel will collect representative samples of the waste and surrounding materials for laboratory analysis. While waiting for the laboratory analytical results, reasonable and practicable measures will be taken to limit the further spread of contamination such as

covering affected soils with plastic, limiting and/or diverting the flow of surface water away from the affected area, or containing liquids in on-site containers.

5. The contaminated material will be removed and properly disposed of in accordance with appropriate regulations and ordinances and in accordance with Section VI of the SPCC Plan. Spill regulations, public safety and local solid waste ordinances may also be applicable depending on the release/waste type, level and type of threat posed and affected media. PCGP will, where feasible, comply with the regulatory notification and containment requirements. If the extent of contamination is too widespread for economical removal, or if disposal options are technically infeasible or cost-prohibitive, backfilling of that portion of the trench will be suspended until appropriate mitigation options are approved by regulatory authorities. Where hazardous substances or wastes must be stockpiled pending characterization or regulatory approval, PCGP will take precautions to isolate the substances (e.g., appropriate liner for storage area, berms, etc.).

In addition, PCGP will:

1. Ensure that a qualified person, who can recognize chemical contamination problems at the job site, is in charge of the cleanup project. Where necessary, PCGP will contact 911 to obtain 24-hr. Hazard Recognition/First Responder Trained personnel to be the first assessor of a potential release.

2. Ensure workers assigned to the cleanup are trained in the hazard control and safety measures that will be used at the site (e.g., respirators, protective clothing, decontamination techniques, etc., per OSHA 29 CFR 1910 standards).

If it is necessary to remove contaminated soils from the right-of-way, either from an accidental spill of materials during construction or if unknown and previously unsuspected pre-existing contamination is encountered, PCGP will replace the contaminated material with clean, uncontaminated soil that is weed free. The replacement soil will be verified to be clean before its use by sampling and analysis for total petroleum hydrocarbons gasoline range organics, total petroleum hydrocarbons diesel range organics, volatile organic compounds (VOC), semi-VOC, PCBs, and Resource Conservation Recovery Act metals in accordance with EPA testing methods. Additionally, PCGP's Environmental Inspectors will verify that the replacement soil is free of noxious weeds.

If contamination cannot be completely removed from an area, ODEQ will be consulted on appropriate remediation.

6.0 REFERENCES

Delta Environmental. 2006. Level II Environmental Assessment, Former Weyerhaeuser Containerboard Mill. April 2, 2006.

Jordan Cove Energy Project L.P. 2017. Resource Report No. 7, Soils. Docket No. CP17-495-000.

Oregon Department of Environmental Quality Guidance for Ecological Risk 1998. Assessment: Levels I, II, III, IV. Portland, OR.

Attachment 1

Potential for Natural-Occurring Mercury Mineralization to Enter the Aquatic Environment between MP 109 and East Fork Cow Creek

Potential for natural-occurring mercury mineralization to enter the aquatic environment between M.P. 109 and East Fork Cow Creek

Williams' Pacific Connector Gas Pipeline Project

Hydrologic Feature C – an intermittent (disrupted) stream channel and adjacent wetland on Forest Road 3200-500 (FIG. 5)

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November 18, 2009 (Revised February 3, 2010)

PURPOSE AND NEED

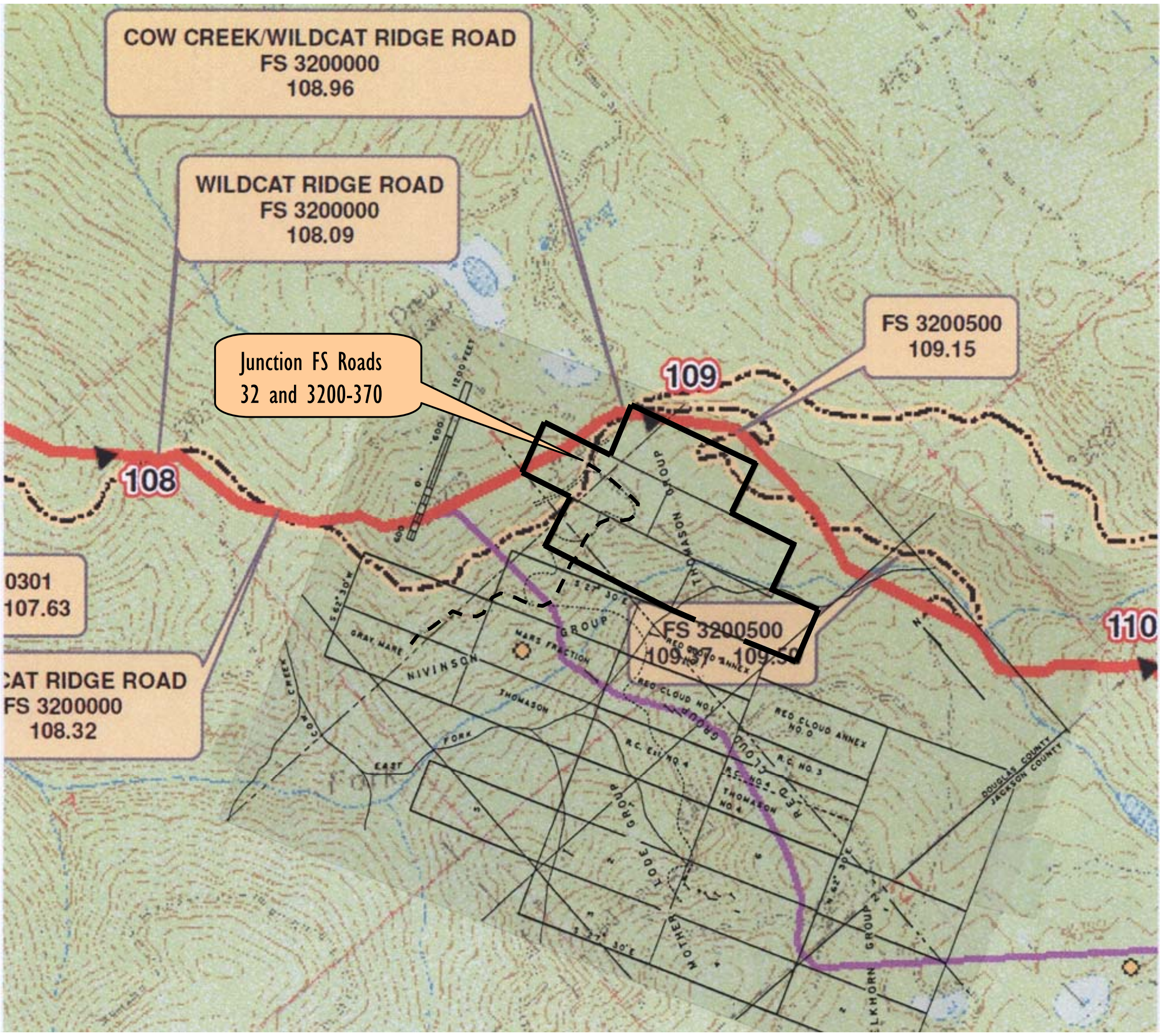
Wes Yamamoto, Resource Staff, Tiller Ranger District, Umpqua National Forest, requested my assistance to assess the potential for natural-occurring mercury reaching the aquatic environment as a consequence of Williams' Pacific proposed construction of a liquefied gas pipeline across the historic Thomason mining property. Prospecting and exploration activities occurred on these lode claims in the 1940's in search of mercury resources. This claim group encompasses a short segment of the finalized alignment located directly down slope from the junction of Forest Roads 32 and 3200-500 in the East Fork Cow Creek watershed[1] (FIG. 1). Yearlong residents of the upper Cow Creek watershed have voiced concern that pipeline construction activities in this locality may possibly intercept and expose soils containing native mercury; and that such disturbed sediment could be transported by surface erosion processes into the aquatic ecosystem. These residents have apprehension about water quality, specifically for domestic use.

My effort in this project consisted of collecting a number of soil samples for analytical testing of mercury and other naturally-occurring mineral substances along a 2,000-foot section of pipeline alignment extending from M.P. 109 to the East Fork Cow Creek, with focus on the area encompassing the historic Thomason claim group. I also collected several stream sediment samples along the main stem East Fork Cow Creek and its principal tributaries upstream from where the pipeline alignment first crosses the East Fork Cow Creek to ascertain if elevated (anomalous) amounts of mercury are present higher in the drainage system.

BACKGROUND

Lewis Thomason was among the original group of miners that staked numerous claims throughout the East Fork Cow Creek watershed beginning in the late 1920's. Throughout the 1930's and into the early 1940's miners conducted prospecting and exploration activities to uncover economic deposits of mercury mineralization throughout the area. The principal mercury property in the locale is the Red Cloud mine. This property reportedly produced at least 6 flasks (and possibly as many as 63 flasks) of elemental mercury or quicksilver by roasting cinnabar-bearing vein material in an on-site rotary furnace or retort (Ramp, 1963, p. 57).

[1] The spatial configuration of the Thomason claim block depicted in FIG. 1 is derived from a survey conducted in the early 1940's by an unknown author, as reported by Brooks (1963, Fig. 20, p. 59). Unfortunately, this survey map does not conform well spatially with topographic and cultural features when superimposed onto the 7.5-Minute Series, Richter Mountain 1:24,000 USGS 1989 topographic map. FIG. 1 provides the best approximation of the spatial configuration of the Thomason claim group with respect to the junction of Forest Roads 32 and 3200-370 and the historic Red Cloud mine site, features that are common to both map documents. Even doing so, the relative position of the East Fork Cow Creek differs considerably on these maps. I scaled the early 1940's survey map as a transparent overlay and placed it over a scanned version of PCGP's USGS Quad Based Transportation Map - Sheet No. 16 of 55, Drawing No. 3430.31-Y-016. The spatial orientation of the Thomason claim block near the junction of Forest Roads 32 and 3200-500 differs from that depicted by GeoEngineers, Inc. in Figures 2, 3, and 5 in their Red Cloud Mine Report transmitted electronically by Lauri Dalton, PCGP Project Engineer to Wes Yamamo on September 10, 2007. GeoEngineers, Inc. interpretation places the the intersection of Forest Roads 32 and 3200-370 in the center of a wetland depression (sag pond) several hundred feet north of the junction of Forest Roads 32 and 3200-500.



Pacific Connector Gas Pipeline Project, LP
USGS Quad Based Transportation Map; M.P. 102.80 to M.P. 110.20, Douglas County, Oregon
Section of map shown is scanned from Sheet No. 16 of 55, Drawing No. 3430.31-Y-016, May 2009, Revision 5

FIG. 1 Williams' Pacific finalized pipeline alignment in near vicinity of the historic Thomason mining claims
Thomason claim group is outlined in a bold black line

The Thomason claim group consists of five unpatented lode claims that are approximately situated in the southeast quarter of section 16 of T. 32 S., R. 2 W., WM, Douglas County, Oregon (FIG. 1). Development on the Thomason Group is said to consist of at least 4 bulldozer trenches, each about 100 feet long and several shallow shafts and pits, all of which were dug by Mr. Lewis Thomason during the early to mid 1940's. Mr. Thomason is also said to have bored about 500 auger holes to depths of 6 to 8 feet, reporting favorable "pannings" over several acres. Few of these holes penetrated below the soil mantle and rock fragments (colluvium) into the underlying decomposed schistose bedrock of the Klamath Mountain terrain. Several narrow fault zones having approximately the same trend as those at the Red Cloud mine were exposed by trenching operations, but none of these surface workings are said to have contained an appreciable amount of cinnabar (Brooks, 1963, p. 62).

Detailed geologic mapping in the East Fork Cow Creek watershed (Murray and Kays, 2001) reveals that much of the hillside that extends from the ridgeline where Forest Roads 32 and 3200-500 join down to the East Fork Cow Creek encompasses an ancient, deep-seated landslide deposit (FIG. 2). The presence of gravity-transported (colluvial) soils associated with this landform provides a plausible explanation why Mr. Thomason's auger holes never penetrated into the underlying bedrock. The chaotic mixture of broken rock fragments and soil matrix in this landslide mass is largely derived from the cliff-forming ash-flow tuff unit, the Tuff of Bond Creek, located one air-mile to the east.

Prior to the current and finalized alignment of the Pacific Connector Gas Pipeline within the East Fork Cow Creek watershed, the prior pipeline right-of-way crossed the East Fork Cow Creek through the Mars Fraction, part of the Nivinson Group of mercury lode claims (FIG. 1). According to Brooks (1963, p. 62), the Nivinson mining property is said to be developed by numerous short mine adits (horizontal tunnels) and open bulldozer cuts. Pannings taken from mine adit dumps are reported to contain traces of cinnabar. The lower mine adit, cited to be about 100 feet in length on the north bank of the East Fork Cow Creek in a large open cut, was reported by local historians to have contained pieces of high-grade cinnabar float (Brooks, 1963, p. 62).

In June and July of 2007, GeoEngineers, Inc., consultant to Williams' Pacific, conducted extensive soil and stream sediment sampling at selected sites in the upper reach of the East Fork Cow Creek watershed for geochemical analysis, based on the presence of known mercury mineralization and past mining activities conducted in that area. GeoEngineers, Inc. collected 21 soil samples on June 17, 2007 at the following sites: along a one and a half mile segment of Forest Road 32 between spurs -300 and -370, waste dumps on the Mars Fraction lode claim, and waste dumps at the Red Cloud mine (FIGS. 3a-b). At their own discretion, GeoEngineers submitted these samples to Apex Labs located in Tigard, Oregon for analytical testing.

On July 18, 2007 GeoEngineers, Inc. collected an additional 42 soil and stream sediment samples at five locations in the upper reach of East Fork Cow Creek delineated by the Umpqua National Forest. These locations are identified as Sample Areas A, B, C, D, E, and F (FIGS. 3a-b). GeoEngineers, Inc. submitted these 42 samples to the ALS Chemex Laboratory located in Reno, Nevada for analytical testing.

Sample Areas A, B, and C are situated along the East Fork Cow Creek where stream sediment samples were collected. Sample Area A corresponds to a segment of stream channel below the confluence of an unnamed stream originating at the Red Cloud mine site. Sample Area B corresponds to a section of stream channel located below the Mars Fraction lode (Nivinson Group) and the unnamed stream draining the Red Cloud mine. Sample Area C corresponds to a reach of stream channel located approximately one-third mile above the Nivinson Group. Sample Areas D, E, and F reflect sites where historic mercury mining activities were conducted. Soil sediment samples were collected in the following three areas. Sample Area D coincides with a one-mile segment of Forest Road 32 situated between Forest Roads 3200-300 and 3200-330[2]. Sample Area E corresponds to samples collected in waste dumps on the Mars Fraction of the Nivinson Group. Sample Area F corresponds to samples collected in waste dumps on the Red Cloud mine site (FIGS 3a-b). All 42 soil and stream sediment samples submitted to the ALS Chemex Laboratory were tested for 49 chemical substances (analytes). The results of analytical testing collected at Sample Areas A, B, C, D, E, and F on July 18, 2007 are displayed in Table 3.

FIELD METHODS

On Saturday, October 10, 2009 I traversed on foot portions of the pipeline alignment between M.P. 109 and the East Fork Cow Creek looking for evidence of surface workings such as dozer cuts or shallow pits in near vicinity of the historic Thomason Group of lode claims and to collect soil samples for analytical testing. No historic surface workings were observed in vicinities that I walked. A string box was used to measure distances along Forest Road 3200-500 to points where foot traverses were made down slope to the pipeline's alignment to collect soil samples. Soil sample sites were marked on the ground with an 8-inch long wooded stake. Pink flagging was hung to nearby vegetation. A total of six soil samples were collected along this section of the pipeline alignment. In addition, I collected three stream sediment samples along the East Fork Cow Creek upstream from where the pipeline alignment crosses the East Fork Cow Creek. The location of the aggregated 9 soil and stream sample sites is depicted in FIG. 4.

Fine-textured soil and stream sediment samples, each averaging approximately two to three pounds weight, were collected with a stainless steel trowel and placed into a labeled zip-lock plastic bag sealed within another zip-lock plastic bag or "double bagged" as an precautionary measure against accidental leakage and contamination. Samples were subsequently wet-washed through an 80-mesh stainless steel sieve to reduce the bulk of samples for analytical testing. The stainless steel sieve was thoroughly washed between screenings to prevent contamination. The 80-mesh minus soil and stream sediment samples, averaging about half a pound weight, were again placed into labeled zip-lock plastic bags in similar fashion and transmitted to ALC Chemex Laboratory located in Reno, Nevada for geochemical analytical analysis.

[2] Analytical results from the 12 soil samples collected in road cuts along Forest Road 32 between spurs -300 and -330 (Sample Area D) reveal very low mercury values; ranging from below detectable limits to a high of 0.02 parts per million (ppm) or 0.02 mg/kg. In contrast, the highest reported mercury (Hg) values in surface workings and waste rock dumps on the Red Cloud mine property are 53.5 and 60.1 ppm (GeoEngineers, Inc., 2007).

ANALYTICAL METHODS

To maintain consistency, sample preparation and analytical procedures on the six soil and three stream sediment samples transmitted to ALC Chemex Laboratory are identical to those specified by GeoEngineers, Inc. for the 42 soil and stream sediment samples that this lab received on July 24, 2007. Sample preparation methods are described in TABLE 1 and sample analytical procedures are outlined in TABLE 2.

ALS Lab Code ID	Description
WEI-21	Received Sample Weight
LOG	Sample login – Received w/o BarCode
SCR-41	Screen to 180 um and save both fractions

TABLE 1 Sample preparation methods specified to ALS Chemex Laboratory

ALS Lab Code ID	Description
ME-MS61	48 Element four-acid digestion via ICP-MS[3]
Hg-CV41	Trace Hg – Cold vapor AAS[4]

TABLE 2 Sample analytical procedures specified to ALS Chemex Laboratory

[3] ICP-MS denotes inductively-coupled plasma-mass spectrometry
[4] AAS denotes atomic-absorption spectroscopy

EVALUATION

Twelve soil samples were collected by GeoEngineers, Inc. on July 18, 2007 at roughly equal-spaced intervals along a one-mile segment of Forest Road 32 situated between Forest Roads 3200-300 and 3200-330 (Sample Area D). Review of the geologic literature indicates that this area is located well outside the zone of mercury mineralization within the East Fork Cow Creek watershed (Brooks, 1963, p. 58-62; Ramp, 1972, p. 48-49, 54-58; Murray, 1994, p. 214-215, 218-219, 221-222, 226-227; Murray and Kays, 2001). Findings from the August 22, 2007 geochemical analysis disclose that all twelve soil samples contained very low levels of mercury (Hg) mineralization (Table 4). Mercury values ranged from below detectable limits to a high of 0.02 parts per million (ppm). These values are considered to reflect ambient background or baseline conditions for mercury in the local geologic environment; and thus afford a means of comparison to areas where elevated or anomalous amounts of mercury are present. The highest reported mercury values detected to date in the East Fork Cow Creek watershed are in waste rock (dumps) located on the historic Red Cloud mine property. The highest mercury values at this mine site are 53.5 and 60.1 ppm, reflecting a 3×10^3 increase (three orders of magnitude) above ambient background levels.

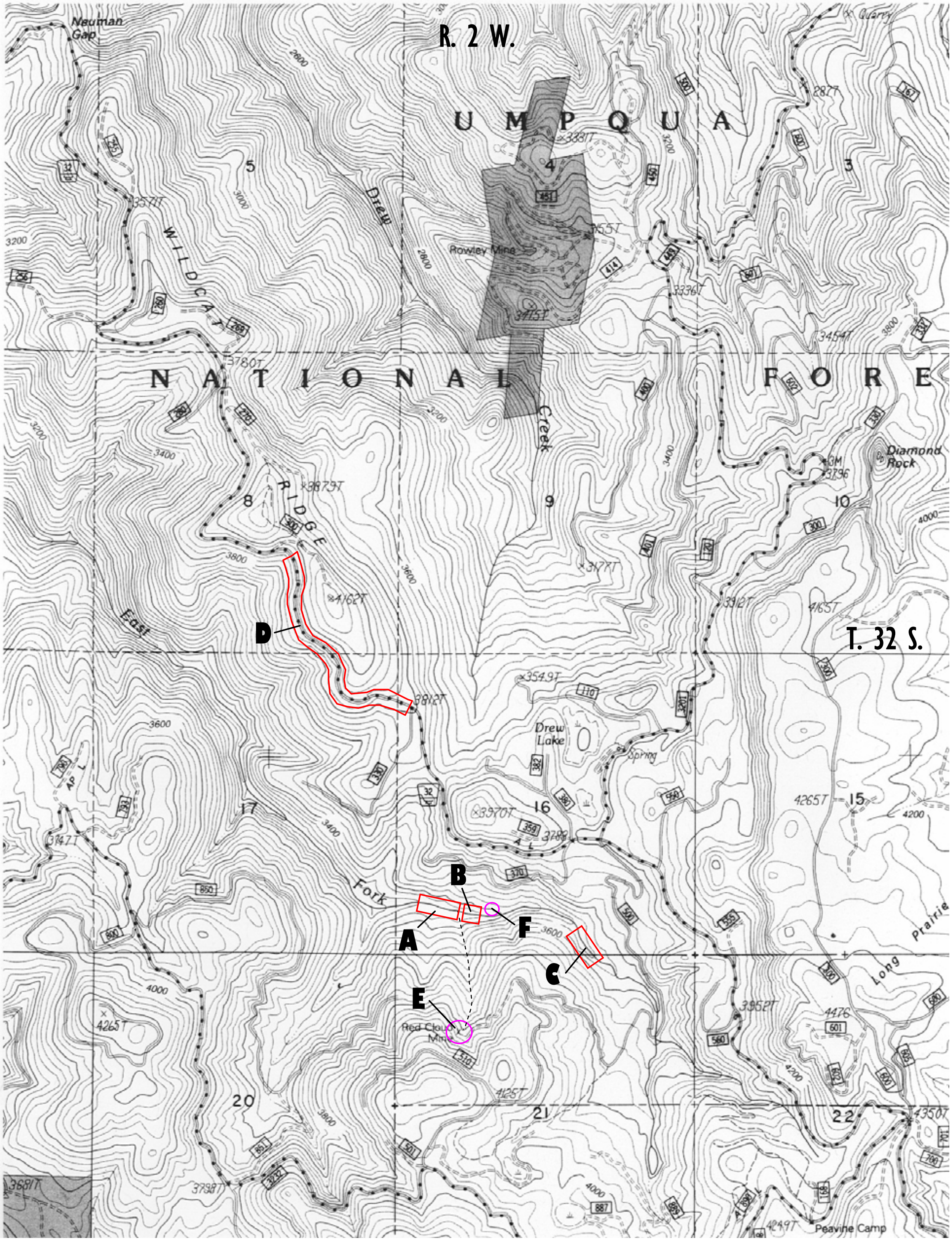


FIG. 3a Umpqua National Forest designated soil ◯ and stream sediment □ Sample Areas A through F

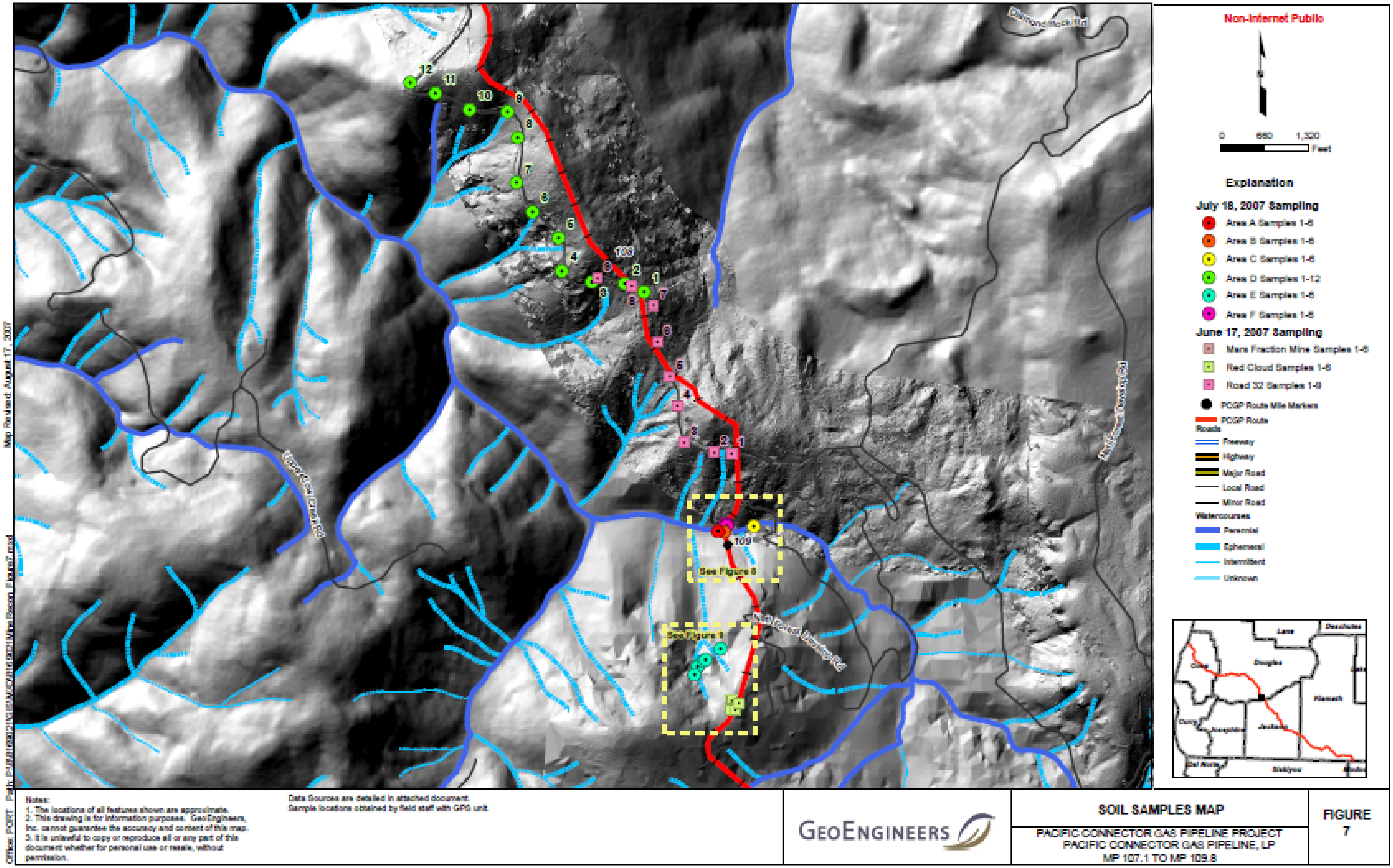


FIG. 3b Locations (Sample Areas A through F) where soil and stream sediment samples were collected by GeoEngineers, Inc. during their July 18, 2007 field investigation

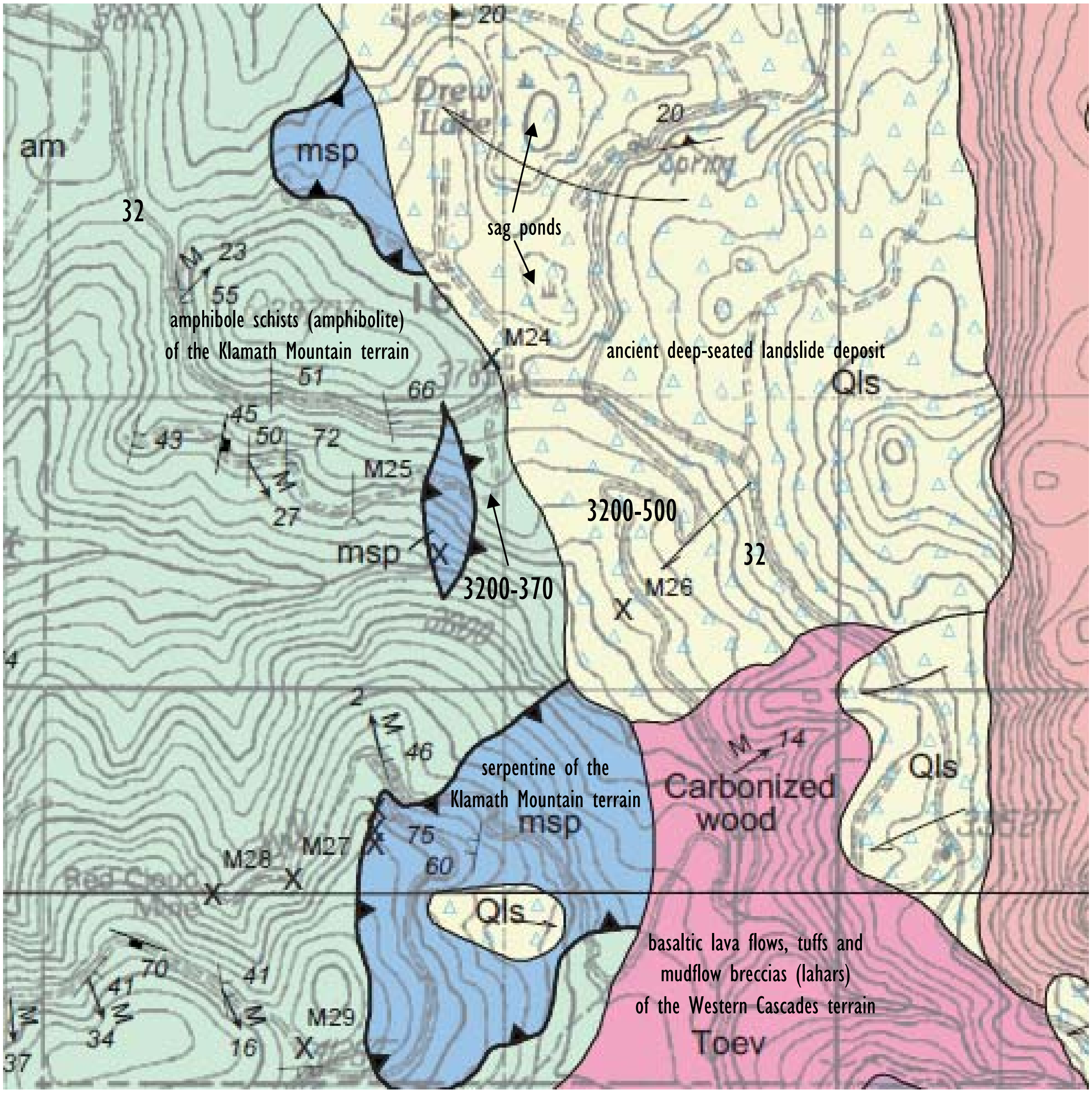


FIG. 2 Geologic map encompassing East Fork Cow Creek and surrounding area (Murray and Kays, 1991)

Contact -- Approximately located

Fault -- Dashed where inferred: ball and bar on downthrown block

Thrust fault -- Approximately located; sawteeth on upper (tectonically higher) plate

60 Minor fault (not traced) -- Showing strike and dip

Minor fault (not traced) -- Vertical or nearly vertical dip

20 Inclined joint -- Showing strike and dip

20 Minor inclined vein -- Showing strike and dip

30 Inclined bedding -- Showing strike and dip

60 Inclined cleavage -- Showing strike and dip

Vertical or near-vertical cleavage -- Showing strike

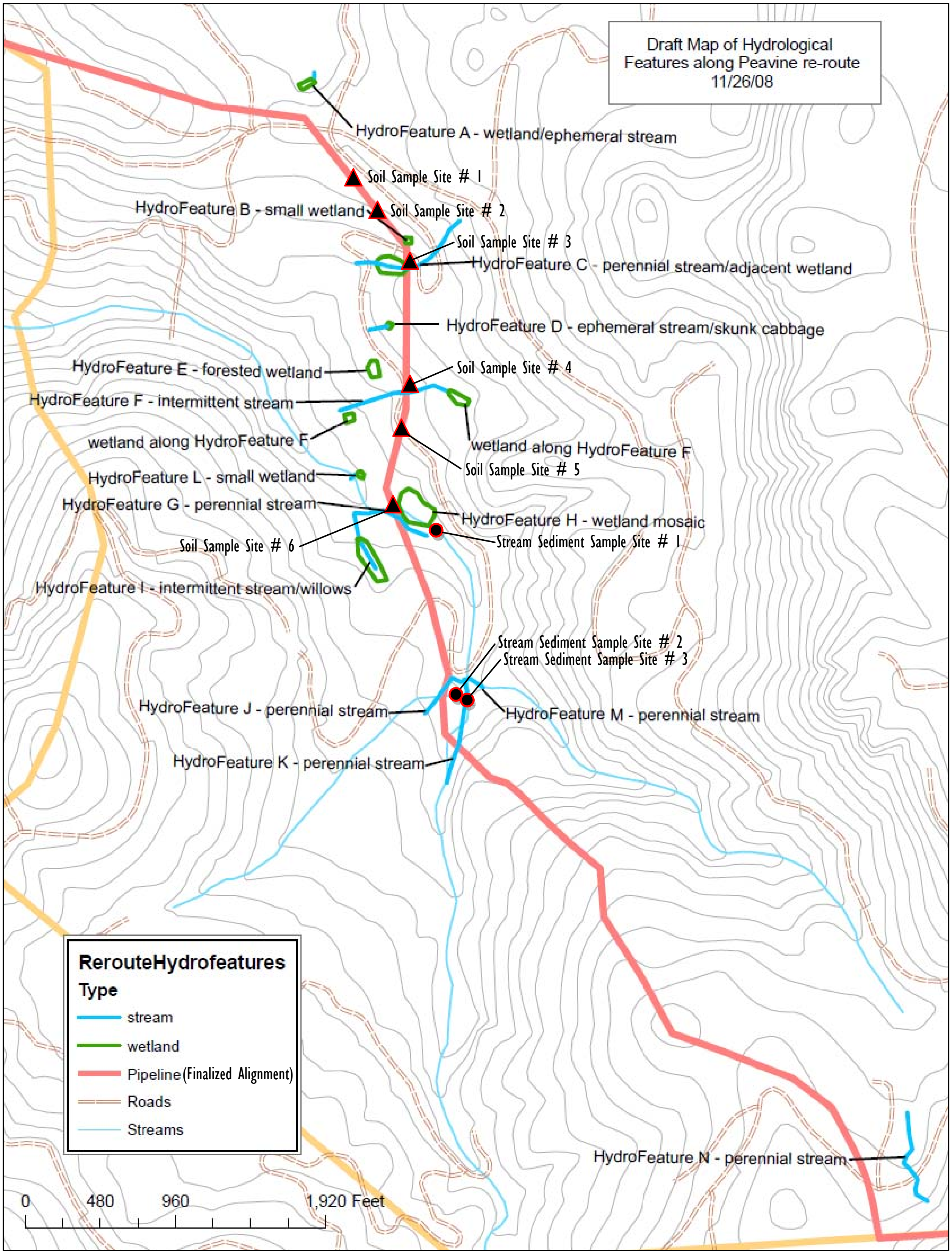


FIG. 5 Hydrologic features along the finalized pipeline alignment in the East Fork Cow Creek watershed
Field reconnaissance by Amy Rusk, District Hydrologist and Denise Dammann, Forest Hydrologist, November 26, 2008
Soil and stream sediment sample sites by Larry Broeker, Consultant Geologist to the Umpqua NF, October 10, 2009

On October 10, 2009 I collected six soil samples along the pipeline alignment between the intersection of Forest Roads 32 and 3200-500 and the East Fork Cow Creek, as well as three stream sediment samples; one on the mainstem East Fork Cow Creek and one on each of its principal tributaries higher in the system (FIG. 4). To maintain consistency and uniformity, these samples were submitted to the assay lab utilized by GeoEngineers, Inc., ALS Chemex, Inc. located in Reno, Nevada, employing the same sample preparation techniques and like analytical procedures. Findings from the November 16, 2009 geochemical testing for the six soil samples disclosed mercury values ranging from a low of 0.03 ppm (mg/kg) to a high of 0.09 ppm (mg/kg). All six soil samples had mercury values slightly above established ambient background levels of 0.02 ppm or lower indicating that the geologic environment in near vicinity of the historic Thomason mining claims contains very low concentrations of mercury. Results from the three stream sediment samples likewise revealed negligible mercury values; ranging from a low of 0.06 ppm (mg/kg) to a high of 0.29 ppm (mg/kg) (TABLE 4).

The Oregon Department of Environmental Quality (ODEQ) Level II Screening Level Values for ecological risk of mercury bioaccumulation[5] in freshwater sediment is 0.07 ppm (ODEQ, 1998; ODEQ, 2007). Two of the three stream sediment samples equal or exceed this threshold limit, EFCC-SS-1 at 0.07 ppm and EFCC-SS-2 at 0.29 ppm. Stream sediment sample EFCC-SS-2 taken from a tributary of the East Fork Cow Creek that drains a significant portion of an ancient earth flow landform located in section 21 of T. 32 S., R. 2 W. has a mercury value of 0.29 ppm. At least one unnamed mercury prospect has been identified in the upper reaches of this drainage. Presumably, if a sufficient volume of fine-textured sediment having mercury values in excess of 0.07 ppm is deposited into a water body with stagnant anaerobic conditions, the process of bioaccumulation can take place. Pipeline construction activities that transect the two principal tributaries forming the East Fork Cow Creek will inherently stir up sediment containing levels of inorganic mercury that equal or exceed the ODEQ threshold for bioaccumulation in fresh water sediment. Fine-textured sediment containing low levels of native inorganic mercury are continually being transported downstream in a relatively high-gradient stream channel of Cow Creek. This sediment is ultimately deposited and stored in Galesville Reservoir. This natural-occurring geologic process has been operative for countless millennia.

[5] Bioaccumulation refers to the process whereby mercury becomes increasingly more concentrated as it moves up through the food chain from absorption in vegetative matter to ingestion by living organisms, and ultimately, intake by humans. Inorganic mercury in the form of the mercury sulfide mineral (cinnabar) or its liquid elemental form (quicksilver) can readily be converted into an organic mercury compound (methyl-mercury) via bacterial action in an oxygen deficient (anaerobic) environment, such as that which occurs in muddy sediment at the bottom of a stagnant water body like a pond or lake. Vegetative matter in such an anaerobic environment absorbs the methyl-mercury, macro-invertebrates ingest the plant matter, bottom-dwelling fish swallow the macro-invertebrates, and humans consume the contaminated fish tissue. The Oregon Department of Human Services (DHS) generally issues advisories when the average mercury level in fish tissue from a particular water body is 0.35 ppm or greater. The average level of mercury found in fish from Galeville Reservoir is 0.69 ppm (Oregon Department of Human Services, 2001).

Two potential avenues for the transport of soil containing naturally-occurring mercury mineralization into the aquatic ecosystem as a consequence of proposed pipeline construction activities include: (1) perennial or intermittent streams that the pipeline alignment transects, and (2) the pipeline corridor or right-of-way itself.

Several intermittent streams do in fact traverse the finalized pipeline alignment along that segment of Forest Road 3200-500 extending from the intersection of Forest Road 32 and East Fork Cow Creek. These streams are identified as Hydrologic Features C and F (FIG. 5). Further field reconnaissance in this locality by Amy Rusk, Hydrologist, Tiller Ranger District and Denise Dammann, Forest Hydrologist on November 6, 2009 revealed that neither of these stream channels have direct connectivity with the East Fork Cow Creek. Both stream systems have disrupted flow patterns due to the "benchy" or stair-stepped ground topography associated with the ancient landslide deposit. Stream flow dissipates into the deep, gravity-transported (colluvial) soils on gently-sloping landslide benches and exudes as seeps and springs at the toe of adjoining scarps further downslope. Fine- and coarse-textured sediment being carried as bedload by either of these stream channels is deposited and stored on these benches. There is no direct connectivity for sediment generated from proposed pipeline construction activities to reach the East Fork Cow Creek.

The other plausible means for mercury-laden sediment to enter into the East Fork Cow Creek is from proposed construction activities along that section of the pipeline alignment construction extending from the intersection of Forest Roads 32 and 3200-500 and East Fork Cow Creek. Williams Pacific has developed in their (still in revision) Erosion Control and Revegetation Plan (ECRP) a number of temporary and permanent erosion control measures to minimize the potential for sediment to enter a wetland or water body (Williams Pacific, 2009).

Temporary or short-term erosion control measures (best management practices) are to be employed throughout the construction phase of the proposed pipeline; such measures being routinely monitored by an Environmental Inspector (EI) or authorized company representative. Along the pipeline construction right-of-way the following temporary erosion control measures are to be implemented:

(1) Sediment barriers consisting of silt fences or straw bales are to be installed to confine sediment; the number and distance between such structures to be determined by the EI. At present, the ECRP has not established distances between sediment barriers based on factors such as slope gradient, soil type, rainfall intensity, etc.

(2) Slope breakers constructed of soil mounds, silt fencing, staked straw bales, straw wattles, or sand bags are to be installed to reduce runoff velocity, concentrated flow, and to divert surface water in a manner to avoid excessive erosion.

(3) Mulch will be placed on disturbed ground prior to seeding, if it becomes necessary to delay final clean-up, including final grading and installation of permanent erosion control measures, beyond 20 days after the trench is backfilled.

Permanent erosion control measures (best management practices) are to be utilized to reduce sediment-transported pollutants and contaminants in storm water discharge following completion of all construction phases. Along the pipeline construction right-of-way, including temporary storage areas, the following permanent erosion control measures are to be implemented:

(1) Trench breakers, consisting of sand-filled sacks, are to be installed in the trench and "keyed" into trench walls or slopes prior to backfilling to slow the flow of subsurface water within the trench to prevent erosion of backfill materials. Spacing distances between trench breakers will be according slope gradient specified in the ECRP, unless otherwise directed by the EI or authorized company representative.

(2) Compacted ground from mainline construction activities are to be graded, contoured and scarified to promote infiltration, reduce surface water runoff, minimize erosion, and enhance re-vegetation efforts.

(3) A seedbed will be prepared in disturbed areas, where necessary, to a depth of three to four inches using appropriate equipment to promote a seedbed that is firm, yet rough enough to be conducive to capturing and lodging of seed when broadcast or hydro-seeded.

Implementation of best management practices relating to both temporary and permanent erosion control measures in the ERCP will reduce the likelihood and potential for sediment generated from proposed pipeline construction activities from entering into the East Fork Cow Creek.

The following recommendations were developed in consultation with the ODEQ. They were also discussed and agreed upon at the February 2, 2010 meeting to review the Contaminated Substances Discovery Plan:

(1) Within Riparian Reserves for all hydrologic features crossed by the pipeline between MP's 109 and 110 (FIG. 5) provide 100% post-construction ground cover on all disturbed areas. Wood fiber is the preferred material. In addition, construct water bars at 50-foot intervals.

(2) At hydrologic features G, J, and K (FIG. 5) assure that erosion control measures are in place before the fall rains and monitor for rilling, gullying and other forms of active erosion that may transport sediment into the aquatic environment. If rilling or gullying is occurring that may result in sediment transport into the aquatic environment, improve erosion control measures to preclude sedimentation.

(3) Inspect the construction corridor for sedimentation after each significant storm event (which would be more frequently than a bank-full[6] event) or whenever there is a visual sediment plume downstream. If the sediment source is originating from the pipeline corridor, improve erosion control measures to preclude

sedimentation. An authorized Agency representative will provide information to Williams' Pacific regarding these events.

KEY FINDINGS

Natural-occurring mercury is present in the disrupted soil regolith and underlying bedrock strata throughout the upper reaches of the East Fork Cow Creek watershed. Although quite spotty, mercury values are sufficiently high enough to have warranted exploration, development, and even minor production between the 1930's and 1960's.

Geochemical analysis of six soil samples collected along a 2,000-foot section of the finalized Pacific Connector Gas Pipeline that crosses partly through the historic Thomason mining claims has been determined to have very low concentrations of natural-occurring mercury mineralization.

Reconnaissance field investigation has concluded that two intermittent stream channels (Hydrologic Features C and F) that transect the finalized pipeline alignment lack connectivity to the main stem East Fork Cow Creek, thus any fine-textured sediment generated from proposed pipeline construction activities at these stream crossing sites will be transported and deposited (stored) on hill slope benches further down the channel.

Implementation of best management practices relating to both temporary and permanent erosion control measures in the ERCP will reduce the likelihood and potential for sediment generated from proposed pipeline construction activities entering into the East Fork Cow Creek.

Geochemical analysis of three stream sediment samples collected from the main stem East Fork Cow Creek and its two principal tributaries higher in the drainage also revealed nominal mercury values. Two of the three samples had mercury values that equaled or slightly exceeded the Oregon Department of Environmental Quality (ODEQ) Level II Screening Level Values for ecological risk of bioaccumulation in sediment.

In summary, proposed pipeline construction activities by Williams Pacific within the upper East Fork Cow Creek watershed are not anticipated to disturb and expose soils and bedrock strata that contains more than nominal amounts of natural-occurring mercury mineralization; and any sediment that is generated is not likely to reach the aquatic environment due to implementation of short-term and permanent mitigation measures outlined in Williams Pacific Erosion Control and Revegetation Plan.

[6] Bankfull discharge of a river is a stage of flow that is just contained within the banks.

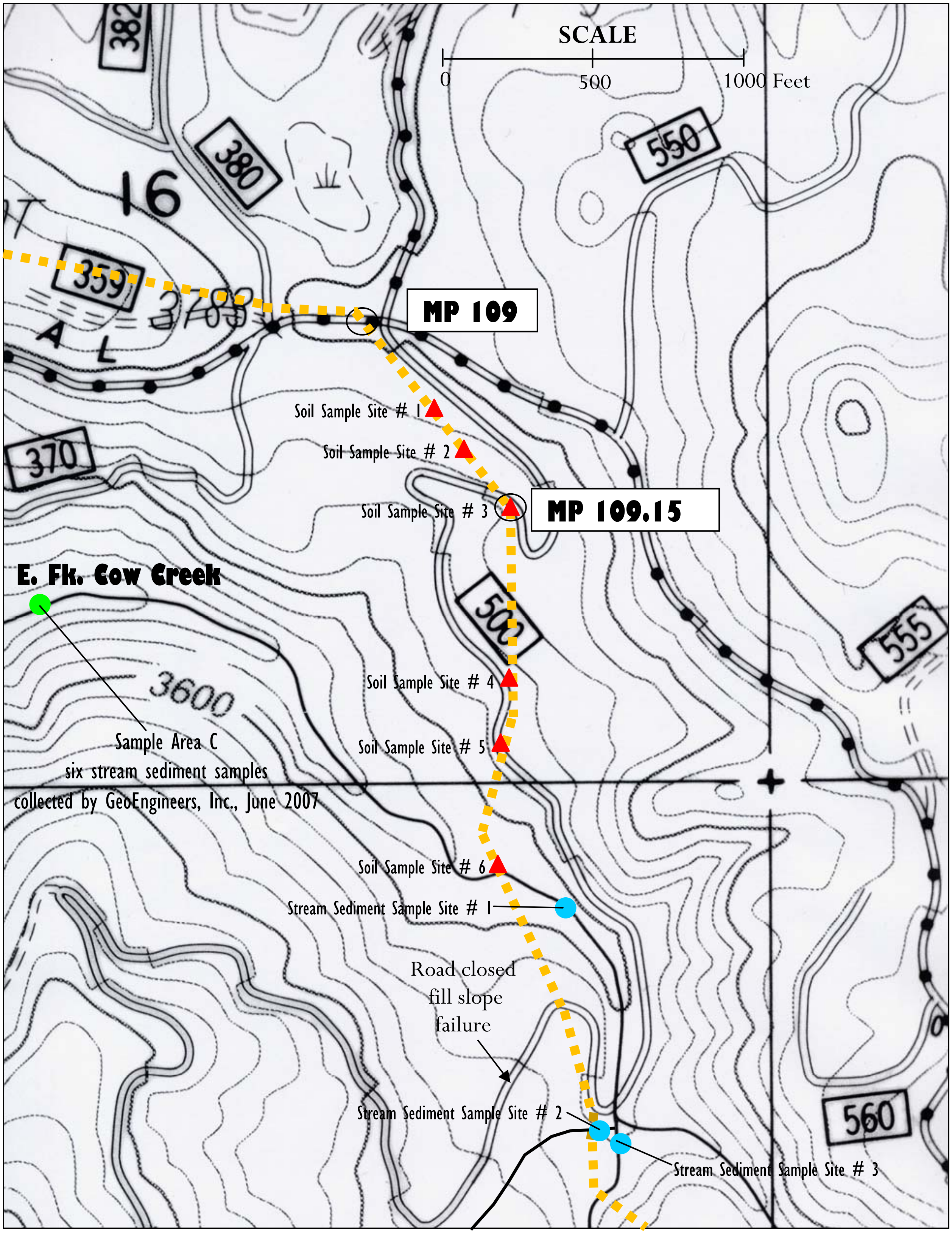


FIG. 4 Location of geochem stream sediment ● and soil sample ▲ sites along pipeline alignment ■ ■ ■ ■ ■

REFERENCES CITED

ALS, Chemex, 2007a, PCGP Project, Red Cloud mine Report No. 8169-021-15, August 22, 2007, p. 2-A to 2-D, Geochemical Analytical Results of 21 samples collected by GeoEngineers, Inc. July 18, 2007,

Brooks, Howard C., 1963, Quicksilver in Oregon: State of Oregon, Department of Geology and Mineral Industries, Bulletin No. 55, 223 p.

GeoEngineers, Inc., 2007, Mine hazards evaluation and mercury testing at the Red Cloud, Mother Lode, Nivinson, and Elkhorn mining groups: GeoEngineers, Inc., Portland, Oregon, Consultant to Pacific Connector Gas Pipeline, LP, File No. 8169-021-15, 8 p. (excluding Appendices A, B, and C)

GeoEngineers, Inc., 2009, Addendum to geologic hazards evaluation: Pacific Connector Gas Pipeline Project, Southwest Oregon: GeoEngineers, Inc., Portland, Oregon, 8 p. (excluding Appendices A, B, and C), January 16

Murray, Robert B., 1994, Geology and Mineral Resources of the Richter Mountain 7.5 Minute Quadrangle, Douglas and Jackson Counties, Oregon: University of Oregon, Dept. of Geological Sciences, Master's thesis, 239 p., pl. 1:24,000

Murray, Robert B., and Allan M. Kays, 2001, Geologic map of the Richter Mountain Quadrangle, Douglas and Jackson Counties, Oregon: State of Oregon Department of Geology and Mineral Industries, Geologic Map Series 103, 24 p., pl. 1:24,000

Oregon Department of Environmental Quality, 1998, Guidance for ecological risk assessment - Levels I, II, III, IV: Oregon Department of Environmental Quality Waste Management & Cleanup Division (contains updates of November, 1998; December 2001; and March 2000)

Oregon Department of Environmental Quality, 2007, Guidance for assessing bioaccumulative chemicals of concern in sediment: Oregon Department of Environmental Quality Environmental Cleanup Program, 07-LQ-023A, last updated April 3, 2007

Oregon Department of Human Services, 2001, Elevated levels of mercury in sport-caught fish from Galesville Reservoir, Douglas County: February 12, 2001 Press Release, 2 p.

Ramp, Len, 1972, Geology and mineral resources of Douglas County, Oregon: Oregon State Department of Geology and Mineral Industries, Bulletin 75, 106 p.

Williams Pacific, LP (2009) Erosion Control and Revegetation Plan (ECRP): Williams Pacific Connector Gas Pipeleine Project, November 2009 (still in revision)

Williams Pacific, LP (2009, Revision 5) USGS Quad Based Transportation Map; M.P. 102.80 to M.P. 110.20, Douglas County, Oregon; Sheet No. 16 of 55, Drawing No. 3430.31-Y-016

TABLE 3

Results of ALS Chemex Geochemical Testing dated August 22, 2007

ALS Chemex
EXCELLENCE IN ANALYTICAL CHEMISTRY

ALS USA Inc.
994 Glendale Avenue, Unit 3
Sparks NV 89431-5730
Phone: 775 356 5395 Fax: 775 355 0179 www.alschemex.com

To: GEO ENGINEERS INC.
15055 SW SEQUOIA PKWY STE140
PORTLAND OR 97224

Finalized Date: 22-AUG-2007
Account: GEOENG

Project: PCGP-RedCloudMine 8169-021-15

CERTIFICATE OF ANALYSIS RE07077668

Sample Description	Method	WEI-21	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61
	Analyte	Recvd Wt.	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	Cu	Fe
	Units	kg	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%
	LOR	0.02	0.01	0.01	0.2	10	0.05	0.01	0.01	0.02	0.01	0.1	1	0.05	0.2	0.01
AREA A Sample 1		0.32	0.08	8.80	15.2	340	1.07	0.07	2.74	0.17	30.80	35.3	201	1.97	40.6	7.49
AREA A Sample 2		0.26	0.03	9.02	7.1	280	0.92	0.05	3.07	0.10	26.80	28.8	263	1.87	31.8	6.57
AREA A Sample 3		0.32	0.15	8.73	13.1	360	1.04	0.05	2.17	0.17	36.30	44.2	151	1.92	43.2	8.22
AREA A Sample 4		0.30	0.02	9.04	7.2	300	0.91	0.06	2.53	0.13	28.30	28.8	187	1.94	38.4	6.46
AREA A Sample 5		0.34	0.05	8.32	12.6	300	1.20	0.08	2.55	0.14	32.30	34.7	199	1.99	39.6	6.36
AREA A Sample 6		0.32	0.29	8.73	9.0	310	0.89	0.06	2.90	0.16	27.80	32.3	197	1.74	37.4	6.78
AREA B Sample 1		0.30	0.07	8.44	7.9	280	0.97	0.05	2.70	0.15	27.30	30.9	198	1.72	40.3	6.64
AREA B Sample 2		0.28	0.08	8.71	11.2	310	1.02	0.06	2.83	0.15	29.00	36.5	214	1.76	38.0	7.33
AREA B Sample 3		0.34	0.05	7.63	10.2	280	1.23	0.06	2.64	0.15	28.10	32.5	194	1.82	43.1	6.73
AREA B Sample 4		0.30	0.05	8.05	11.5	270	1.10	0.05	2.85	0.14	26.70	28.0	220	1.82	37.9	6.53
AREA B Sample 5		0.34	0.06	7.95	9.0	260	1.04	0.08	2.97	0.15	25.00	25.6	255	1.89	38.1	6.29
AREA B Sample 6		0.34	0.06	7.86	7.1	230	1.05	0.06	3.15	0.11	22.20	26.8	344	1.69	36.8	6.44
AREA C Sample 1		0.30	0.04	7.86	7.4	250	1.01	0.06	2.72	0.13	25.80	25.5	246	1.87	35.1	6.16
AREA C Sample 2		0.28	0.03	7.80	8.4	250	1.07	0.05	2.63	0.10	22.70	26.0	235	1.85	32.5	5.91
AREA C Sample 3		0.32	0.03	7.79	7.6	250	1.04	0.05	2.62	0.12	23.10	23.2	174	1.82	33.4	5.60
AREA C Sample 4		0.28	0.05	7.96	9.4	270	1.11	0.05	2.52	0.10	23.00	26.3	182	1.85	32.9	5.93
AREA C Sample 5		0.30	0.05	8.23	8.5	280	0.98	0.05	2.58	0.12	24.80	24.4	234	1.89	34.7	6.36
AREA C Sample 6		0.32	0.33	7.78	10.9	280	1.15	0.05	2.40	0.14	27.10	30.8	189	1.86	36.3	6.67
AREA D Sample 1		0.22	0.04	7.06	1.3	110	0.52	0.04	4.34	0.09	13.85	32.4	280	1.17	51.6	4.98
AREA D Sample 2		0.34	0.04	8.64	<0.2	140	0.62	0.06	5.44	0.08	6.89	25.3	171	0.96	42.1	4.06
AREA D Sample 3		0.34	0.02	8.11	<0.2	80	0.58	0.04	4.59	0.07	6.57	24.4	150	0.36	61.8	3.82
AREA D Sample 4		0.32	0.10	8.65	<0.2	80	0.62	0.06	5.14	0.09	6.00	24.5	163	0.48	52.2	4.19
AREA D Sample 5		0.32	0.04	8.39	0.6	130	0.72	0.06	4.69	0.07	5.99	16.9	166	0.55	64.8	3.62
AREA D Sample 6		0.36	0.05	8.50	<0.2	130	0.66	0.04	4.53	0.11	8.42	26.9	147	0.68	58.8	4.19
AREA D Sample 7		0.28	0.05	8.01	0.2	150	0.74	0.06	5.02	0.23	7.48	24.9	150	0.65	40.6	3.77
AREA D Sample 8		0.30	0.04	8.26	0.4	140	0.65	0.05	4.59	0.11	8.31	26.5	111	0.45	53.3	4.36
AREA D Sample 9		0.32	0.13	8.32	0.4	490	0.67	0.06	5.24	0.25	8.03	26.9	178	0.93	41.4	3.81
AREA D Sample 10		0.38	0.03	9.26	<0.2	90	0.52	0.06	8.29	0.10	13.40	27.1	189	0.56	64.4	4.21
AREA D Sample 11		0.34	0.04	8.71	0.8	90	0.67	0.08	5.76	0.14	13.35	29.8	175	0.80	70.6	4.78
AREA D Sample 12		0.32	0.02	9.09	<0.2	30	0.79	0.01	5.78	0.12	13.50	31.9	182	0.33	78.0	6.13
AREA E Sample 1		0.34	0.10	8.67	1.1	90	0.78	0.05	5.07	0.15	11.20	33.1	172	0.66	85.7	5.53
AREA E Sample 2		0.36	0.06	8.46	13.5	50	0.72	0.03	4.16	0.16	12.05	32.7	180	1.10	91.0	5.42
AREA E Sample 3		0.34	0.09	8.20	14.9	50	0.61	0.04	4.03	0.31	11.10	34.2	187	1.29	103.5	5.20
AREA E Sample 4		0.26	0.15	8.33	0.6	130	0.70	0.07	4.87	0.20	11.60	32.6	168	1.26	69.1	4.88
AREA E Sample 5		0.28	0.09	8.04	0.9	80	0.75	0.05	4.56	0.09	12.50	29.9	179	0.80	91.7	5.18
AREA E Sample 6		0.26	0.04	8.24	0.5	60	0.72	0.05	4.82	0.07	9.40	29.9	159	0.62	94.4	5.15
AREA F Sample 1		0.28	0.04	8.77	0.5	70	0.82	0.05	4.93	0.12	15.60	36.1	298	0.80	126.5	6.21
AREA F Sample 2		0.34	0.04	8.80	1.6	90	0.74	0.05	4.90	0.12	17.45	42.3	257	0.84	111.5	5.95
AREA F Sample 3		0.34	0.09	8.58	1.2	50	0.57	0.02	4.68	0.09	18.05	40.2	278	0.68	141.5	6.09
AREA F Sample 4		0.32	0.04	9.44	1.0	50	0.75	0.02	5.52	0.10	16.90	37.7	305	0.59	107.5	6.59

Comments: REE's may not be totally soluble in MS61 method. Detection limits on samples requiring dilutions for Hg-CV41, due to inteferences or high concentration levels, have been increased according to the dilution factor.

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To: **GEO ENGINEERS INC.**
15055 SW SEQUOIA PKWY STE140
PORTLAND OR 97224

Finalized Date: 22-AUG-2007
Account: GEOENG

Project: PCGP-RedCloudMine 8169-021-15

CERTIFICATE OF ANALYSIS RE07077668

Sample Description	Method / Analyte / Units / LOR	ME-MS61 Ga ppm 0.05	ME-MS61 Ge ppm 0.05	ME-MS61 Hf ppm 0.1	Hg-CV41 Hg ppm 0.01	ME-MS61 In ppm 0.005	ME-MS61 K % 0.01	ME-MS61 La ppm 0.5	ME-MS61 Li ppm 0.2	ME-MS61 Mg % 0.01	ME-MS61 Mn ppm 5	ME-MS61 Mo ppm 0.05	ME-MS61 Na % 0.01	ME-MS61 Nb ppm 0.1	ME-MS61 Ni ppm 0.2	ME-MS61 P ppm 10
AREA A Sample 1		18.60	0.18	2.8	0.04	0.068	0.56	12.9	11.4	2.19	1940	1.97	1.24	6.5	157.0	670
AREA A Sample 2		19.10	0.18	2.8	0.03	0.066	0.48	12.0	11.1	2.38	1315	1.19	1.36	6.8	148.5	550
AREA A Sample 3		18.80	0.20	3.2	0.04	0.075	0.53	14.6	11.0	1.82	2570	2.39	1.00	6.9	148.5	760
AREA A Sample 4		18.80	0.19	3.0	0.06	0.068	0.49	12.9	11.1	2.02	1385	1.40	1.11	6.7	138.0	600
AREA A Sample 5		18.85	0.15	3.0	0.08	0.065	0.49	14.0	13.7	1.96	1535	1.72	1.25	6.1	147.0	600
AREA A Sample 6		18.05	0.19	2.6	0.06	0.067	0.48	12.0	10.9	2.32	1555	1.50	1.34	6.0	155.5	610
AREA B Sample 1		17.60	0.19	2.7	0.03	0.065	0.45	11.8	9.9	2.14	1555	1.77	1.21	6.2	144.0	590
AREA B Sample 2		18.25	0.21	2.8	0.72	0.069	0.47	12.4	10.7	2.23	1905	1.60	1.27	6.3	147.0	620
AREA B Sample 3		18.65	0.12	2.7	0.29	0.064	0.47	12.5	11.9	2.12	1640	2.37	1.08	6.2	153.0	600
AREA B Sample 4		18.55	0.12	2.7	0.04	0.062	0.46	12.2	12.3	2.16	1410	1.67	1.20	6.4	148.0	560
AREA B Sample 5		18.55	0.10	2.7	0.06	0.065	0.47	11.3	12.7	2.19	1250	1.28	1.20	6.3	155.0	550
AREA B Sample 6		19.30	0.11	2.7	0.05	0.065	0.44	9.8	12.5	2.34	1170	1.22	1.36	6.7	155.0	480
AREA C Sample 1		19.00	0.11	2.9	0.05	0.061	0.46	11.7	12.1	2.08	1230	1.30	1.14	6.9	147.0	540
AREA C Sample 2		19.05	0.12	2.9	0.04	0.059	0.45	10.7	11.8	2.00	1320	1.16	1.15	7.2	135.5	510
AREA C Sample 3		19.45	0.11	3.0	0.28	0.061	0.46	10.5	12.2	2.01	1060	1.19	1.11	6.7	135.0	500
AREA C Sample 4		18.80	0.12	2.9	0.04	0.062	0.47	10.4	11.7	1.95	1420	1.24	1.11	6.6	128.0	550
AREA C Sample 5		18.80	0.11	2.9	0.03	0.061	0.50	11.4	11.4	1.96	1290	1.52	1.10	6.6	132.0	590
AREA C Sample 6		18.60	0.13	3.1	0.03	0.065	0.51	11.9	11.5	1.84	1590	1.64	1.02	6.8	137.0	590
AREA D Sample 1		15.80	0.09	1.6	0.02	0.046	0.28	5.9	11.2	3.85	1090	0.42	0.91	2.8	88.8	520
AREA D Sample 2		15.10	0.08	0.4	0.01	0.032	0.24	3.1	11.8	3.89	840	0.14	2.00	1.5	85.2	130
AREA D Sample 3		14.70	0.07	0.3	<0.01	0.035	0.24	2.7	14.2	4.09	460	0.13	1.99	0.8	78.5	200
AREA D Sample 4		15.80	0.07	0.4	0.01	0.037	0.28	2.6	13.7	4.01	604	0.13	1.76	0.8	81.8	240
AREA D Sample 5		15.70	0.07	0.4	0.01	0.038	0.26	2.1	13.8	3.47	570	0.16	1.96	1.0	83.2	240
AREA D Sample 6		15.90	0.07	0.4	0.01	0.037	0.27	3.8	20.5	4.16	658	0.14	1.75	1.0	92.0	270
AREA D Sample 7		15.55	0.08	0.4	0.02	0.041	0.22	3.3	16.4	3.68	915	0.22	1.70	1.4	77.7	220
AREA D Sample 8		17.05	0.09	0.5	0.02	0.044	0.18	4.5	16.7	3.30	721	0.15	1.28	1.4	60.0	220
AREA D Sample 9		16.20	0.07	0.6	0.02	0.038	0.37	3.6	16.2	3.42	1060	0.21	1.87	2.1	98.0	230
AREA D Sample 10		17.10	0.08	0.7	0.01	0.040	0.15	6.2	10.6	3.43	966	0.19	1.73	2.6	97.8	300
AREA D Sample 11		15.80	0.09	0.6	0.01	0.045	0.36	5.7	14.7	3.95	874	0.24	1.99	2.1	94.9	390
AREA D Sample 12		17.50	0.11	0.5	0.02	0.058	0.25	4.6	9.8	3.30	959	0.19	2.13	2.1	60.1	440
AREA E Sample 1		17.15	0.09	0.8	0.22	0.054	0.13	3.7	10.5	3.57	1180	0.29	2.57	2.9	94.8	510
AREA E Sample 2		15.60	0.10	0.7	53.5	0.050	0.13	4.5	11.0	2.27	1050	0.50	2.41	2.3	83.7	630
AREA E Sample 3		15.60	0.10	0.8	60.1	0.048	0.13	4.1	12.7	2.09	944	0.69	2.28	2.4	86.9	700
AREA E Sample 4		16.60	0.09	0.7	0.41	0.048	0.19	4.5	12.5	3.37	1740	0.29	2.30	2.7	98.2	800
AREA E Sample 5		16.30	0.10	0.8	0.06	0.051	0.14	3.9	10.2	3.62	1100	0.23	2.34	2.5	103.5	510
AREA E Sample 6		16.15	0.09	0.7	0.05	0.052	0.11	3.4	9.0	3.60	1180	0.24	2.41	2.1	87.9	290
AREA F Sample 1		17.55	0.11	0.9	0.04	0.063	0.10	5.9	10.5	3.97	1280	0.40	1.95	3.0	181.0	340
AREA F Sample 2		16.25	0.11	0.7	0.17	0.061	0.16	7.0	10.7	4.19	1175	0.47	2.26	2.7	155.5	320
AREA F Sample 3		16.60	0.14	0.8	0.62	0.060	0.08	6.1	8.8	4.51	1110	0.47	2.10	2.4	188.0	290
AREA F Sample 4		16.85	0.11	0.9	0.01	0.073	0.08	5.7	8.8	4.61	1220	0.42	2.17	2.8	176.5	230

Comments: REE's may not be totally soluble in MS61 method. Detection limits on samples requiring dilutions for Hg-CV41, due to inteferences or high concentration levels, have been increased according to the dilution factor.

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Page: 2 - C
Total # Pages: 3 (A - D)
Finalized Date: 22-AUG-2007
Account: GEOENG

Project: PCGP-RedCloudMine 8169-021-15

CERTIFICATE OF ANALYSIS RE07077668

Sample Description	Method / Analyte / Units / LOR	ME-MS61 Pb ppm 0.5	ME-MS61 Rb ppm 0.1	ME-MS61 Re ppm 0.002	ME-MS61 S % 0.01	ME-MS61 Sb ppm 0.05	ME-MS61 Sc ppm 0.1	ME-MS61 Se ppm 1	ME-MS61 Sn ppm 0.2	ME-MS61 Sr ppm 0.2	ME-MS61 Ta ppm 0.05	ME-MS61 Te ppm 0.05	ME-MS61 Th ppm 0.2	ME-MS61 Ti % 0.005	ME-MS61 Tl ppm 0.02	ME-MS61 U ppm 0.1
AREA A Sample 1		13.9	22.7	0.002	0.02	0.64	26.2	2	1.2	179.5	0.46	<0.05	3.0	0.653	0.22	1.0
AREA A Sample 2		6.7	17.0	<0.002	0.01	0.42	26.6	2	1.2	184.5	0.45	<0.05	3.0	0.703	0.16	1.0
AREA A Sample 3		9.3	27.1	<0.002	0.01	0.52	26.5	2	1.2	158.0	0.49	<0.05	3.3	0.664	0.27	1.1
AREA A Sample 4		7.0	23.5	<0.002	0.01	0.44	25.5	2	1.2	165.0	0.46	<0.05	3.0	0.659	0.19	1.1
AREA A Sample 5		31.1	26.0	<0.002	0.02	0.59	27.3	2	1.2	179.0	0.44	<0.05	2.8	0.627	0.15	0.9
AREA A Sample 6		29.4	17.4	<0.002	0.02	0.54	25.1	2	1.2	176.5	0.42	<0.05	2.5	0.626	0.17	0.9
AREA B Sample 1		9.6	20.2	<0.002	0.02	0.47	25.2	2	1.2	164.5	0.43	<0.05	2.7	0.628	0.18	1.0
AREA B Sample 2		18.0	20.9	<0.002	0.09	0.49	26.4	2	1.2	167.5	0.44	<0.05	2.7	0.666	0.19	1.0
AREA B Sample 3		10.7	24.1	0.003	0.02	0.57	27.2	2	1.2	165.0	0.39	<0.05	2.6	0.594	0.18	1.0
AREA B Sample 4		27.4	22.5	<0.002	0.02	0.51	26.1	2	1.2	174.5	0.41	<0.05	2.6	0.615	0.16	1.0
AREA B Sample 5		16.7	17.7	<0.002	0.02	0.53	26.3	2	1.2	174.0	0.42	<0.05	2.6	0.652	0.15	1.0
AREA B Sample 6		7.7	11.1	<0.002	0.02	0.46	26.5	2	1.3	181.5	0.43	<0.05	2.2	0.669	0.14	0.9
AREA C Sample 1		13.2	19.0	<0.002	0.01	0.43	25.6	2	1.2	168.5	0.44	<0.05	2.6	0.666	0.15	1.0
AREA C Sample 2		7.8	14.5	<0.002	0.01	0.41	24.7	2	1.2	169.5	0.45	<0.05	2.5	0.650	0.17	1.0
AREA C Sample 3		8.1	14.9	<0.002	0.01	0.41	25.2	2	1.2	167.0	0.44	<0.05	2.7	0.604	0.16	1.0
AREA C Sample 4		7.8	16.6	<0.002	0.02	0.41	24.4	2	1.2	165.5	0.42	<0.05	2.6	0.605	0.17	1.0
AREA C Sample 5		8.9	23.2	<0.002	0.01	0.48	24.9	2	1.2	168.0	0.42	<0.05	2.7	0.669	0.16	1.0
AREA C Sample 6		9.5	25.3	<0.002	0.01	0.47	25.4	3	1.2	162.0	0.44	<0.05	3.0	0.621	0.18	1.0
AREA D Sample 1		5.7	8.2	<0.002	0.02	0.15	31.7	2	0.7	198.5	0.18	<0.05	1.1	0.372	0.06	0.4
AREA D Sample 2		3.8	2.6	<0.002	0.01	0.11	25.9	2	0.8	197.0	0.11	<0.05	0.7	0.258	0.06	0.3
AREA D Sample 3		4.0	0.9	<0.002	0.01	0.07	25.1	2	0.7	241.0	0.06	<0.05	0.8	0.177	0.07	0.2
AREA D Sample 4		4.2	1.9	<0.002	0.01	0.07	26.7	2	0.8	190.0	0.07	<0.05	0.8	0.186	0.09	0.3
AREA D Sample 5		6.1	1.1	<0.002	0.01	0.09	27.0	2	0.8	232.0	0.07	<0.05	0.8	0.193	0.08	0.2
AREA D Sample 6		4.0	2.3	<0.002	<0.01	0.12	25.8	2	0.8	185.5	0.08	<0.05	0.7	0.205	0.24	0.3
AREA D Sample 7		6.8	2.0	<0.002	0.01	0.16	25.4	2	0.8	198.0	0.10	<0.05	0.7	0.213	0.39	0.4
AREA D Sample 8		5.2	1.0	<0.002	0.01	0.18	25.5	2	0.9	183.5	0.10	<0.05	0.9	0.244	0.13	0.4
AREA D Sample 9		12.4	3.4	<0.002	0.01	0.30	25.3	2	0.8	210.0	0.15	<0.05	0.8	0.308	1.08	0.5
AREA D Sample 10		4.1	2.5	<0.002	0.01	0.14	31.5	2	0.9	214.0	0.18	<0.05	1.5	0.341	0.08	0.5
AREA D Sample 11		3.7	6.3	<0.002	0.01	0.11	30.0	2	0.9	220.0	0.14	<0.05	1.1	0.343	0.08	0.4
AREA D Sample 12		1.5	4.3	<0.002	0.01	0.12	36.4	3	1.1	199.5	0.15	<0.05	0.3	0.646	0.03	0.4
AREA E Sample 1		3.7	1.1	<0.002	0.01	0.17	29.0	3	1.2	170.0	0.20	<0.05	0.8	0.553	0.04	0.3
AREA E Sample 2		4.1	3.2	<0.002	0.03	0.56	32.2	3	1.1	169.5	0.16	<0.05	0.5	0.569	0.04	0.2
AREA E Sample 3		5.1	2.4	<0.002	0.04	0.50	30.5	3	2.4	164.5	0.17	<0.05	0.5	0.617	0.05	0.2
AREA E Sample 4		5.2	4.5	<0.002	0.01	0.13	27.5	3	1.1	172.5	0.19	<0.05	0.9	0.469	0.06	0.3
AREA E Sample 5		2.8	1.3	<0.002	0.01	0.11	27.6	3	1.1	157.0	0.16	<0.05	1.1	0.430	0.03	0.3
AREA E Sample 6		2.4	0.8	<0.002	0.01	0.11	29.1	2	1.0	145.5	0.15	<0.05	0.7	0.432	<0.02	0.3
AREA F Sample 1		3.5	1.2	<0.002	0.02	0.17	34.3	3	1.3	177.0	0.20	<0.05	0.8	0.621	0.03	0.3
AREA F Sample 2		3.0	4.3	<0.002	0.01	0.20	37.7	<1	1.2	167.0	0.18	<0.05	1.6	0.558	0.04	0.4
AREA F Sample 3		3.9	1.0	<0.002	0.01	0.30	41.4	2	1.2	154.0	0.21	<0.05	0.9	0.579	0.05	0.3
AREA F Sample 4		2.5	3.2	<0.002	0.01	0.25	37.0	2	1.3	184.5	0.20	<0.05	0.8	0.661	0.03	0.4

Comments: REE's may not be totally soluble in MS61 method. Detection limits on samples requiring dilutions for Hg-CV41, due to inteferences or high concentration levels, have been increased according to the dilution factor.

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Finalized Date: 22-AUG-2007
Account: GEOENG

Project: PCGP-RedCloudMine 8169-021-15

CERTIFICATE OF ANALYSIS RE07077668

Sample Description	Method / Analyte / Units / LOR	ME-MS61 V ppm 1	ME-MS61 W ppm 0.1	ME-MS61 Y ppm 0.1	ME-MS61 Zn ppm 2	ME-MS61 Zr ppm 0.5
AREA A Sample 1		181	0.9	23.9	117	88.0
AREA A Sample 2		184	0.6	22.7	103	87.8
AREA A Sample 3		193	0.7	25.7	122	97.0
AREA A Sample 4		176	0.6	24.1	104	92.6
AREA A Sample 5		166	0.7	24.9	113	99.2
AREA A Sample 6		171	0.7	22.9	106	82.3
AREA B Sample 1		169	0.6	23.2	102	84.0
AREA B Sample 2		179	6.4	24.3	109	85.7
AREA B Sample 3		166	0.5	26.7	100	91.3
AREA B Sample 4		165	0.4	24.6	95	88.8
AREA B Sample 5		173	0.8	25.0	96	87.4
AREA B Sample 6		175	0.4	23.0	98	87.0
AREA C Sample 1		171	0.4	24.5	96	93.3
AREA C Sample 2		162	0.4	22.7	88	92.8
AREA C Sample 3		161	0.5	22.3	88	93.7
AREA C Sample 4		164	0.4	21.7	90	94.6
AREA C Sample 5		176	0.7	22.0	98	96.5
AREA C Sample 6		171	0.6	24.1	99	98.8
AREA D Sample 1		171	<0.1	15.6	64	49.7
AREA D Sample 2		132	<0.1	13.9	44	10.1
AREA D Sample 3		131	<0.1	12.3	41	7.7
AREA D Sample 4		140	<0.1	14.0	45	8.7
AREA D Sample 5		146	<0.1	12.7	40	9.2
AREA D Sample 6		147	<0.1	15.2	52	9.1
AREA D Sample 7		125	<0.1	14.3	73	11.4
AREA D Sample 8		134	<0.1	13.8	50	12.5
AREA D Sample 9		140	<0.1	14.1	95	17.3
AREA D Sample 10		136	<0.1	18.7	50	15.7
AREA D Sample 11		156	<0.1	18.9	60	13.4
AREA D Sample 12		208	<0.1	31.1	68	8.3
AREA E Sample 1		179	0.1	19.7	75	18.8
AREA E Sample 2		171	0.1	25.1	63	13.6
AREA E Sample 3		177	0.1	22.3	102	14.9
AREA E Sample 4		146	<0.1	19.7	87	18.2
AREA E Sample 5		163	0.1	18.1	60	18.9
AREA E Sample 6		164	<0.1	17.6	60	14.9
AREA F Sample 1		191	0.2	26.9	81	20.5
AREA F Sample 2		189	0.2	24.0	77	15.5
AREA F Sample 3		198	0.2	30.4	74	16.1
AREA F Sample 4		204	0.2	27.5	73	18.2

Comments: REE's may not be totally soluble in MS61 method. Detection limits on samples requiring dilutions for Hg-CV41, due to inteferences or high concentration levels, have been increased according to the dilution factor.

TABLE 4

Results of ALS Chemex Geochemical Testing dated November 16, 2009

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Finalized Date: 16-NOV-2009
Account: BROLAR

Project: East Fork Cow Creek

CERTIFICATE OF ANALYSIS RE09120235

Sample Description	Method / Analyte / Units / LOR	WEI-21 Recvd Wt. kg 0.02	ME-MS61 Ag ppm 0.01	ME-MS61 Al % 0.01	ME-MS61 As ppm 0.2	ME-MS61 Ba ppm 10	ME-MS61 Be ppm 0.05	ME-MS61 Bi ppm 0.01	ME-MS61 Ca % 0.01	ME-MS61 Cd ppm 0.02	ME-MS61 Ce ppm 0.01	ME-MS61 Co ppm 0.1	ME-MS61 Cr ppm 1	ME-MS61 Cs ppm 0.05	ME-MS61 Cu ppm 0.2	ME-MS61 Fe % 0.01
EFCC-S-1		0.08	0.06	8.15	9.8	770	1.41	0.11	1.22	0.04	41.1	7.2	207	4.93	15.1	2.03
EFCC-S-2		0.08	0.07	7.23	8.9	820	1.10	0.09	1.41	0.09	33.8	9.2	205	3.48	11.5	1.58
EFCC-S-3		0.22	0.03	9.09	9.2	600	1.30	0.15	1.17	0.08	44.0	16.4	316	3.82	25.6	4.50
EFCC-S-4		0.28	0.08	7.04	8.0	700	1.15	0.13	1.40	0.06	50.4	6.2	33	3.71	12.0	2.01
EFCC-S-5		0.18	0.03	9.58	13.2	500	1.25	0.18	0.70	0.04	70.2	6.5	42	8.40	15.5	3.18
EFCC-S-6		0.12	0.09	9.09	11.3	810	1.69	0.13	1.32	0.10	21.9	4.8	24	5.05	13.3	1.93
EFCC-SS-1		0.18	0.04	8.62	9.7	290	1.21	0.10	2.20	0.11	27.4	25.8	154	2.24	28.2	5.98
EFCC-SS-2		0.28	0.02	8.31	7.6	170	0.79	0.05	3.10	0.09	19.00	43.8	584	1.32	43.0	6.55
EFCC-SS-3		0.20	0.04	8.95	10.9	320	1.04	0.06	1.95	0.13	33.2	22.4	64	1.84	33.2	6.51

***** See Appendix Page for comments regarding this certificate *****

ALS Chemex
EXCELLENCE IN ANALYTICAL CHEMISTRY
ALS USA Inc.
4977 Energy Way
Reno NV 89502
Phone: 775 356 5395 Fax: 775 355 0179 www.alschemex.com

To: **UMPQUA NATIONAL FOREST**
UMPQUA NATIONAL FOREST
2900 NW STEWART PKY
ROSEBURG OR 97471

Finalized Date: 16-NOV-2009
Account: BROLAR

Project: East Fork Cow Creek

CERTIFICATE OF ANALYSIS RE09120235

Sample Description	Method / Analyte / Units / LOR	ME-MS61 Ga ppm 0.05	ME-MS61 Ge ppm 0.05	ME-MS61 Hf ppm 0.1	ME-MS61 In ppm 0.005	ME-MS61 K % 0.01	ME-MS61 La ppm 0.5	ME-MS61 Li ppm 0.2	ME-MS61 Mg % 0.01	ME-MS61 Mn ppm 5	ME-MS61 Mo ppm 0.05	ME-MS61 Na % 0.01	ME-MS61 Nb ppm 0.1	ME-MS61 Ni ppm 0.2	ME-MS61 P ppm 10	ME-MS61 Pb ppm 0.5
EFCC-S-1		16.75	0.08	2.6	0.030	1.79	24.6	17.1	0.34	1080	0.71	1.78	9.5	25.4	200	14.4
EFCC-S-2		14.35	0.09	2.2	0.025	1.94	18.6	18.9	0.29	2000	0.54	1.75	9.9	26.4	340	16.6
EFCC-S-3		21.4	0.13	4.7	0.075	1.23	24.5	29.0	1.04	1180	1.37	0.88	11.4	56.2	330	11.2
EFCC-S-4		15.80	0.10	4.3	0.046	1.04	26.9	25.9	0.44	943	0.80	1.35	12.1	8.3	260	13.6
EFCC-S-5		21.8	0.10	3.7	0.053	1.02	34.0	19.1	0.42	251	1.51	0.99	9.9	18.4	250	14.0
EFCC-S-6		21.9	0.07	1.9	0.029	1.43	13.0	40.2	0.28	402	0.87	2.10	7.8	21.8	420	17.5
EFCC-SS-1		21.3	0.11	3.5	0.090	0.53	12.1	16.0	1.42	1370	1.38	1.00	7.6	82.7	650	7.9
EFCC-SS-2		17.45	0.09	2.1	0.060	0.34	7.6	12.8	4.32	1360	0.54	1.26	5.0	342	420	4.9
EFCC-SS-3		22.6	0.10	4.0	0.074	0.44	13.9	16.0	0.83	1550	2.13	0.79	8.5	34.9	680	8.2

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CERTIFICATE OF ANALYSIS RE09120235

Sample Description	Method / Analyte / Units / LOR	ME-MS61 Rb ppm 0.1	ME-MS61 Re ppm 0.002	ME-MS61 S % 0.01	ME-MS61 Sb ppm 0.05	ME-MS61 Sc ppm 0.1	ME-MS61 Se ppm 1	ME-MS61 Sn ppm 0.2	ME-MS61 Sr ppm 0.2	ME-MS61 Ta ppm 0.05	ME-MS61 Te ppm 0.05	ME-MS61 Th ppm 0.2	ME-MS61 Ti % 0.005	ME-MS61 Tl ppm 0.02	ME-MS61 U ppm 0.1	ME-MS61 V ppm 1
EFCC-S-1		88.1	<0.002	0.01	1.16	7.2	2	1.6	167.0	0.74	<0.05	9.7	0.352	0.64	3.0	43
EFCC-S-2		74.7	<0.002	0.01	1.12	5.5	2	1.3	168.0	0.75	<0.05	6.6	0.349	0.56	2.4	37
EFCC-S-3		64.1	<0.002	0.01	0.90	22.8	2	1.9	124.0	0.78	<0.05	7.6	0.616	0.40	5.0	116
EFCC-S-4		54.6	<0.002	0.01	1.07	9.7	2	1.3	190.0	0.86	<0.05	8.2	0.403	0.46	3.0	37
EFCC-S-5		82.5	<0.002	0.01	1.24	12.3	2	2.2	98.1	0.80	<0.05	15.5	0.320	0.57	4.2	56
EFCC-S-6		60.8	<0.002	0.01	1.00	5.1	1	1.7	185.5	0.75	<0.05	6.0	0.214	0.44	1.6	31
EFCC-SS-1		22.6	<0.002	0.01	0.53	27.6	1	1.5	159.0	0.57	<0.05	3.3	0.706	0.20	1.3	177
EFCC-SS-2		7.0	<0.002	0.01	0.29	27.3	1	1.2	139.5	0.36	<0.05	1.6	0.627	0.11	0.6	178
EFCC-SS-3		19.9	<0.002	0.02	0.56	27.8	1	1.5	186.0	0.61	0.05	3.2	0.768	0.19	1.1	192

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CERTIFICATE OF ANALYSIS RE09120235

Sample Description	Method / Analyte / Units / LOR	ME-MS61 W ppm 0.1	ME-MS61 Y ppm 0.1	ME-MS61 Zn ppm 2	ME-MS61 Zr ppm 0.5	Hg-CV41 Hg ppm 0.01
EFCC-S-1		1.5	13.8	50	81.8	0.06
EFCC-S-2		1.7	12.8	60	75.0	0.07
EFCC-S-3		1.1	27.5	84	155.0	0.04
EFCC-S-4		1.3	24.3	61	172.0	0.03
EFCC-S-5		1.9	21.8	59	105.0	0.09
EFCC-S-6		1.6	8.4	82	55.9	0.05
EFCC-SS-1		0.8	22.4	103	123.5	0.07
EFCC-SS-2		0.8	19.3	87	74.2	0.29
EFCC-SS-3		0.8	25.0	109	143.5	0.06

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