CONCRETE DEMOLITION AND REMOVAL WORK PLAN

Final (Revision 1)

Pump Station J (Ida Joe Native Allotment), Canadian Oil (CANOL)
Pipeline Project No. 4
(Formerly Used Defense Site [FUDS] No. F10AK1033):
Vicinity of Midway Lake, Alaska

Prepared Under Cooperative Agreement No. W912DY-18-2-0307

March 2019

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ACRONYMS AND ABBREVIATIONS

'	minutes
"	seconds
°	decimal degrees
-	negative
°F	degrees Fahrenheit
ACD	Alaska Community Database
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
BD/DR	building demolition/debris removal
Bristol	Bristol Environmental Remediation Services, LLC
BTEX	benzene, toluene, ethylbenzene, and xylenes
CA	Cooperative Agreement
CANOL	Canadian American Northern Oil Line
CD-ROM	compact disk-read only memory
CESQG	conditionally exempt small quantity generator
CON/HTRW	containerized hazardous, toxic, and radioactive waste
DERP	Defense Environmental Restoration Program
DoD	U.S. Department of Defense
DOE	Determination of Eligibility
DR	debris removal
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
FDE	findings and determination of eligibility
FUDS	Formerly Used Defense Site
GRO	gasoline range organics
HFP	Haines-Fairbanks Pipeline
HTRW	hazardous, toxic, and radioactive waste
ID	identification
INPR	Inventory Project Report
ID	identification
Keres	Keres Consulting, Inc.
NALEMP	Native American Lands Environmental Mitigation Program

ACRONYMS AND ABBREVIATIONS (continued)

NVT	Native Village of Tetlin
PAHs	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
PLO	Public Land Order
PM	Project Manager
PLO	Public Land Order
PM	Project Manager
Pump Station J Site	CANOL Pump Station J Site – Ida Joe Native Allotment Site
RRO	residual range organics
SA	site assessment
SAR	Site Assessment Report
SHPO	State Historic Preservation Office
SOW	Scope of Work
SS	Site Superintendent
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
Sundance	Sundance Consulting, Inc.
SVOCs	semivolatile organic compounds
TCC	Tanana Chiefs Conference
TVC	Tetlin Village Council
USACE	US Army Corps of Engineers
UST	underground storage tank
VOCs	volatile organic compounds
Work Plan	Concrete Demolition and Removal Work Plan

APPROVALS

This planning document was prepared under the supervision and direction of the undersigned individuals.

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TVC NALEMP Coordinator

3/25/2019
Date

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1.0 INTRODUCTION

Bristol Environmental Remediation Services, LLC (Bristol) has prepared this Concrete Demolition and Removal Work Plan (Work Plan), under the direction of the Tetlin Village Council (TVC), in accordance with the Notice to Proceed received on 27 December 2018.

The scope of work (SOW) covered under this Work Plan includes demolition and removal of former concrete building foundations at the former Canadian Oil Line (CANOL) Pump Station J Site (Pump Station J site). The site is located approximately 11 miles northeast of the Native Village of Tetlin (NVT). The NVT is located along the Tetlin River, between Tetlin Lake and the Tanana River, 20 miles southeast of Tok, Alaska. The Pump Station J site is located at Milepost 1285.5, along the 296-mile Alaska corridor of the pipeline (Figure 1). The Pump Station J site is located on a Native Allotment owned by Ms. Ida Joe (Figure 2). The Alaska Department of Environmental Conservation (ADEC) File No. for the site is 170.38.034 and the assigned Hazard Identification (ID) No. is 3255.

This project is being funded by the U.S. Department of Defense (DoD) under the Native American Lands Environmental Mitigation Program (NALEMP). NALEMP is administered by the US Army Corps of Engineers (USACE) for the DoD through Cooperative Agreements (CAs) with federally recognized tribes. This work is being performed under Task 2 of CA No. W912DY-18-2-0307.

This Work Plan will be submitted to the USACE Alaska District and the ADEC for review, comment, and approval. Responses to USACE comments on the Draft Work Plan and a copy of the ADEC Work Plan Approval Letter are included in Appendix A.

1.1 ORGANIZATION OF THE WORK PLAN

This Work Plan is divided into the following six sections:

- **Section 1.0 – Introduction**. Section 1.0 introduces the project, provides a brief summary of the NALEMP program, and provides the organizational layout of this Work Plan.
- **Section 2.0 – Site Description and History**. Section 2.0 details general site location and ownership, climate, ecology and geology, tribal history, site history, previous environmental work to date, and current site regulatory status.
- **Section 3.0 – Objectives and Scope of Work**. Section 3.0 presents the project objectives and SOW. This section also outlines project organization, responsibilities, and includes the proposed project schedule.
- **Section 4.0 – Concrete Demolition Field Activities**. Section 4.0 discusses concrete demolition and removal field activities planned for the Pump Station J Site.
- **Section 5.0 – Reporting**. Section 5.0 describes the project reporting efforts that will be conducted to document and report the concrete demolition and removal field effort.
- **Section 6.0 – References**. Section 6.0 lists all references used in the preparation of this Work Plan.

2.0 SITE DESCRIPTION AND HISTORY

The following subsections include discussions of site location, site description, land use, climate, ecology and geology, tribal history, site history, land ownership, previous environmental site work performed to date, and current site regulatory status.

2.1 LOCATION AND OWNERSHIP

The NVT is located along the Tetlin River, between Tetlin Lake and the Tanana River, approximately 20 miles southeast of Tok, Alaska (Figure 1). The village is bounded by the Tetlin National Wildlife Refuge (TNWR) to the East. The village is connected to the Alaska Highway by a private road maintained by the TVC. The community lies at approximately 63.1380 decimal degrees (°) north latitude and -142.5197° west longitude (Section 26, Township 016 North, Range 015 East, Copper River Meridian). The current community population is 127 according to the 2010 U.S. Department of Labor estimate (Bristol, 2016).

The Pump Station J site is located at Milepost 1285.5, along the 296-mile Alaska corridor of the pipeline. The site is located approximately 31 miles southeast of Tok, Alaska. The legal description is Section 32 of Township 17 North, Range 17 East, in the Copper River Meridian, Alaska. Although debris is widely scattered, the point location for the site is 63 degrees (°) 12 minutes (′) 33 seconds (″) north latitude and 142° 11′ 47″ west longitude. The altitude of the site is approximately 1,900 feet above mean sea level (amsl) (Figure 1) (Bristol, 2016). A copy of the Native allotment property map is included as Figure 2.

2.2 SITE DESCRIPTION AND LAND USE

The total size of the Ida Joe Native Allotment is 159.94 acres, all of which are located at the Pump Station J site. The portion of the allotment potentially impacted by the Pump Station J site appears to be 60 acres. A modern cabin is located on the site. Previously reported impacts at the site include concrete building foundations, scattered 55-gallon

drums, scattered metal debris, scattered wood debris, a dilapidated building structure, and a below-grade storage area containing 55-gallon drums, sheet metal exhaust pipes, industrial-sized oil filters, and a drinking water well casing. A small pond located within 100 feet northeast of the site entrance contains decaying 55-gallon drums, which did not have legible markings (Sundance Consulting, Inc. [Sundance], 2007).

The Pump Station J site is currently used for recreation, traditional and cultural use area, and as wildlife habitat. The current land owner would like to use the land for residential purposes in the future.

2.3 CLIMATE

Tetlin is located in the Fairbanks Recording District. Tetlin lies within the continental climatic zone, with cold winters and warm summers. In the winter, cold air settles in the valley and ice fog and smoke are common. The average low during January is negative (-) 32 degrees Fahrenheit (°F); the average high during July is 72 °F. Extreme temperatures have been measured from -71 to 99 °F (Alaska Community Database [ACD], 2017).

2.4 ECOLOGY AND GEOLOGY

The Tetlin area is located in the upper Tanana River Valley that contains the northwesterly flowing Tanana River. The Upper Tanana River Valley comprises lowland spruce-hardwood forest ecosystems. Intermittent permafrost is found in low-lying areas. Vegetation in the region includes quaking aspen, black spruce, white spruce, paper birch, tamarack, and balsam poplar trees (David B. Hayes [Hayes], 1977). Additional vegetation includes low willow brush, scrub alder, and a moss/peat layer. The geology of the Tanana River Valley has been significantly influenced by glacial activity during the last ice age resulting in glacial moraines and deposits. The area is home to wildlife such as brown bear, black bear, caribou, moose, wolf, lynx and a variety of furbearers and rodents (U.S. Department of Agriculture, Natural Resources Conservation Service [NRCS], 2004).

Steep terrain bounds the site to the north and northwest and a wetland area is located to the southeast. A small pond is located 100 feet northeast of the site entrance (Sundance, 2007). Surface runoff from the site goes directly into the adjacent wetland, which drains to the south through a culvert under the highway (U.S. Environmental Protection Agency [EPA], 1999).

2.5 TRIBAL HISTORY

The semi-nomadic Athabascan Indians have historically lived in this area, moving with the seasons between several hunting and fishing camps. In 1885, Lieutenant H.T. Allen found small groups of people living in Tetlin and Last Tetlin, to the south. The residents of Last Tetlin had made numerous trips to trading posts on the Yukon River. In 1912, villagers from Tetlin would trade at the Tanana Crossing Trading Post. During the Chisana gold stampede in 1913, a trading post was established across the river from Tetlin. When two trading posts were opened in the village during the 1920s, residents from Last Tetlin relocated to Tetlin. A school was constructed in 1929, and a post office was opened in 1932. The 786,000-acre Tetlin Indian Reserve was established in 1930. An airstrip was constructed in 1946. When the Alaska Native Claims Settlement Act (ANCSA) was passed in 1971, the reserve was revoked. The NVT opted for surface and subsurface title to the 743,000 acres of land in the former Reserve (ACD, 2017).

2.6 SITE HISTORY

The following subsections present a brief summaries of site history, including ownership history, CANOL Pump Station J site history, and Alaska Department of Natural Resources (ADNR) State Historic Preservation Office (SHPO) site status.

2.6.1 Ownership History

The following is the ownership history of the Pump Station site:

- Public Land Order (PLO) No. 12, dated 20 July 1042, withdrew a strip of land 20 miles on either side of the planned Alaska Highway.

- PLO No. 270, dated 5 April 1945, reduced the withdrawal to a strip five miles on either side of the Alaska Highway.
- PLO No. 386, dated 31 July 1947, revoked both PLO Nos. 12 and 270 and further reduced the withdrawal to a strip of land 300 feet on either side of the Alaska Highway. PLO No. 386 also withdrew a strip of land 10 feet on either side of the CANOL No. 4 pipeline constructed parallel to the Alaska Highway and withdrew 60 acres for Pump Station J.
- PLO No. 386 was revoked on 24 February 1972 by Section 19(a) of Public Law 92-203. The land was transferred back to the Bureau of Land Management (BLM).
- On 11 April 1988, the 159.94-acre property was issued to Mr. Donald J. Joe under Native Allotment Certificate # 50-88-0075.
- On 13 May 1993, title to the Donald J. Joe Native Allotment was transferred to Ms. Ida M Joe (81.25 %) and Ms. Sherlene G. Joe (18.75 %) under Probate No. SA 238N 93.
- On 29 October 2003, complete title to the property was transferred to Ms. Ida M. Joe.

2.6.2 Pump Station J History

Construction of the CANOL No. 4 project began in 1942 and was completed in February 1944. From February 1944 to August 1945, the CANOL Pump Station J served as part of the DoD diesel fuel supply pipeline for Ladd Field in Fairbanks, Alaska. The CANOL pipeline was used to transfer aviation gasoline, motor gasoline, and diesel fuel oil. The Whitehorse refinery, which supplied fuel to the pipeline, shut down in April 1945. Fuel pumped through the pipeline after the refinery was shut down was supplied via a pipeline from Skagway. The CANOL pipeline ended operation in July 1946. The Alaska portion of the CANOL pipeline was turned over to the Alaska District Corps of Engineers in 1946 pending a decision on the final disposition of the pipeline. After inspections, repairs, and testing were completed, the restored CANOL pipeline was returned to service in May 1948. Fuel was transferred from Skagway to Whitehorse via CANOL No. 2 and then on to Fairbanks via CANOL No. 4. Use of the CANOL No. 2 and No. 4 continued until 1955

when the Haines-Fairbanks Pipeline (HFP) went into operation. The HFP was installed roughly parallel to CANOL No. 4 (Department of Army, 2016).

Specific operational history is unavailable, but hazardous materials potentially stored and used at the pump station included fuel, lubricants, solvents, polychlorinated biphenyl (PCB)-containing oil, herbicides, pesticides, and asbestos (Keres Consulting, Inc. [Keres], 2003).

Design drawings indicate that the Pump Station J site consisted of a pump house, a water facility, an electric facility, a dispensing facility, living quarters, a garage, a 100-barrel underground storage tank (UST), a 300-barrel UST, and two 2,250-barrel aboveground storage tanks (ASTs). Building foundations and other structural debris exist on the site (Keres, 2003).

The Defense Environmental Restoration Program –Formerly Used Defense Site (DERP-FUDS) completed an Inventory Project Report (INPR) and findings and determination of eligibility (FDE) for the CANOL No. 4 project in August 2006. The INPR was revised in 2016. The INPR and FDE determined that the CANOL No. 4 project was eligible for inclusion under the DERP-FUDS program. The INPR and FDE also determined that a private contractor completed the physical removal of the pipeline on 9 October 1974. However, some sections that had been previously removed by landowners, and some sections that were previously buried by road construction and maintenance activities were not removed by the contractor.

The FUDS No. for the Pump Station J site is F10AK1033-03, which falls under the primary CANOL No. 4 project FUDS No. F10AK1033.

2.6.3 Alaska State Historic Preservation Office Site Status

The USACE has found that the Pump Station J site is not eligible for the National Register of Historic Places (NRHP); however, the USACE Archaeologist (Kelly Eldridge) is in the

process of preparing a letter to the ADNR SHPO in order to request and receive concurrence on the Determination of Eligibility (DOE) for the site. Upon receiving ADNR SHPO concurrence on the DOE, the USACE Archaeologist will prepare and submit a formal letter of assessment.

ADNR SHPO authorization will be obtained prior to performance of the scoped concrete demolition and removal effort. Copies of all USACE Archaeologist and ADNR SHPO correspondence will be included in the Concrete Demolition and Removal Report.

2.7 PREVIOUS ENVIRONMENTAL WORK TO DATE

Table 2-1 provides a summary of all previously documented site inspection and SA activity performed to date at the Pump Station J site.

Table 2-1 Summary of Previous SI and SA Activities

Site Investigation/Action	Document Type	Purpose/Findings
Tanana Chiefs Conference (TCC) and Portage Environmental Preliminary Assessment of the Former CANOL Pump Station J (EPA, 1999)	Report	Information regarding this Preliminary Assessment was not available.
CANOL Pump Station J, Site Inspection Report (EPA, 1999)	Report	A site visit was completed in May 1998 to prepare for forthcoming site inspection activities. During the site visit concrete foundations, a well casing, 55-gallon drums, oil sheen in the pond water, stained soil, industrial-sized oil filters, buried 2-inch pipeline, a 4-inch pipe vent, engines, pumps, building debris, an 8-inch pipeline, and stressed vegetation were observed during the site visit.

Table 2-1 Summary of Previous SI and SA Activities (continued)

Site Investigation/Action	Document Type	Purpose/Findings
CANOL Pump Station J, Site Inspection Report (EPA, 1999)	Report	In July 1998, site inspection activities were conducted which included the collection of 12 surface soil samples, 10 subsurface soil samples, five sediment samples, and four surface water samples. Background samples and samples from nine potential source areas were analyzed for gasoline range organics (GRO), benzene, toluene, ethylbenzene, and xylenes (BTEX), diesel range organics (DRO), residual range organics (RRO), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and heavy metals. Results of the site inspection indicated that VOCs and SVOCs may be migrating from the site into the onsite wetland. The VOCs and SVOCs that were detected at elevated concentrations are likely related to fuel oils and lubicrating oils used during operations of the pump station facilities. Lead, zinc, iron, and manganese were also detected at elevated concentrations in the surface water.
NALEMP Phase I Draft Technical Report, Haines/Fairbanks (ALCANGO) and CANOL (Canadian Oil) Pipelines (TCC, 2001)	Report	This report details the information evaluated during the literature search or Phase I Assessment of available recods for CANOL Pipeline F10AK1033 and Haines/Fairbanks Pipeline F10AK1016. The assessment was completed to determine eligibility of the sites for inclusion in several evaluations under the NALEMP. It was determined that the CANOL Pipeline site was very large, had more releases than the Haines/Fairbanks Pipeline, and impacts from activities are located on Native Allotments.
Draft Step I Site Assessment Report (SAR): Canadian Oil (CANOL) Pump Station J and Camp J, Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) ID No. AK0002021848. NVT, Tetlin, Alaska (Keres, 2003).	Report	This site assessment report (SAR) detailed information evaluated during the literature and historical records search of available data for CANOL Pump Station J and Camp J sites located at Milepost 1285.5 of the Alaska Highway. The report summarized that impacts existed and that the impacts were the results of former DoD activity. It was determined that the site was eligible under NALEMP.

Table 2-1 Summary of Previous SI and SA Activities (continued)

Site Investigation/Action	Document Type	Purpose/Findings
Draft Step III SAR: Canadian Oil (CANOL) Pipeline Project No. 4 (Formerly Used Defense Site [FUDS] ID No. F10AK1033): CANOL Pump Station J Site – Ida Joe Native Allottment (No FUDS ID assigned), CANOL Pipeline Project No. 4 (FUDS ID No. F10AK1033): Camp J Site – Lucy David Native Allotment (No FUDS ID assigned), and CANOL Pipeline Project No. 4 (FUDS ID No. F10AK1033): Lulu David Native Allotment Site (No FUDS ID Assigned) (Sundance, 2007).	Report	Sundance recommended mitigation actions for known soil contaminants and building demolition/debris removal (BD/DR) material. Soil samples from the September 2006 SI indicated concentrations of GRO, DRO, and arsenic above ADEC cleanup levels. Sundance recommended characterization of drum contents and any other potential hazardous waste, delineation of contaminated soil, removal of BD/DR and contaminated soil, and monitoring contamination migration to groundwater. A recommendation was also made to conduct speciation of chromium and to sample the onsite pond and wetlands. Sundance concluded that the site was unsuitable for residential development and use.
Defense Environmental Restoration Program – Formerly Used Defense Site (DERP-FUDS) Revised Inventory Project Report (INPR) for Property No. F10AK1033, Canadian Oil (CANOL) Pipeline No. 4, Whitehorse-Fairbanks Division, Alaska (Department of Army, 2016)	Report	Report provides recommendation to further delineate the existing hazardous, toxic, and radioactive waste (HTRW) project (F10AK1033-01) and to add five new containerized HTRW (CON/HTRW) projects (F10AK1033-02, -03, -04, -05, and -06). Enclosures include revised 2016 property summary sheet, 2006 findings and determination of eligibility, property maps, 2008/2016 HTRW project summary sheets, and 2016 CON/HTRW project summary sheets.

Table 2-1 Summary of Previous SI and SA Activities (continued)

Site Investigation/Action	Document Type	Purpose/Findings
Site Assessment and Debris Removal Report Pump Station J (Ida Joe Native Allotment), Canadian Oil (CANOL) Pipeline Project No. 4 (Formerly Used Defense Site [FUDS] No. F10AK1033) Vicinity of Midway Lake, Alaska Prepared Under Cooperative Agreement No. W912DY-16-2-0307 Final, October 2018 (Bristol, 2018)	Report	Site assessment (SA) and debris removal (DR) field activities included site reconnaissance, brush removal, and site access improvements in preparation of the scoped 2018 SA/DR field effort. The TVC cleared and removed approximately 18 cubic yards of woody brush during site access improvement activities. DR activities performed during the 2018 field season included the inspection, consolidation, and removal of approximately 60 cubic yards of inert, non-hazardous former military surface debris. Bristol and the TVC documented remaining larger debris items requiring heavy equipment to facilitate future removal. Remaining surface debris items (drums and sections of pipe) and subterranean drum bunkers/caches/vaults should be thoroughly investigated as potential source areas. Scoped SA activities included the advancement and sampling of soil from soil borings, the installation of temporary well points to facilitate the collection of groundwater samples, the collection of surface water and associated sediment samples, and the collection of concrete sample from former building foundations. The conclusions of the scoped 2018 SA effort at the Pump Station J site indicate that petroleum contamination is present in surface and/or subsurface soil across a large portion of the site at concentrations exceeding ADEC Method Two Soil Cleanup Levels. A total of 13 of the 20 soil borings exhibited concentrations of petroleum hydrocarbons (GRO and/or DRO), VOCs, including BTEX, and/or polynuclear aromatic hydrocarbons (PAHs), including 1-methylnaphthalene, 2-methylnaphthalene, and/or naphthalene above ADEC Method Two Soil Cleanup Levels. Arsenic was also present in all subsurface soil samples collected from the soil borings; however, concentrations of arsenic present are believed to be naturally occurring. The results of the scoped SA effort indicated that groundwater appears to be impacted at the Pump Station J site. Groundwater samples collected and analyzed from the two temporary well points that were able to be installed exhibited concentrations of petroleum hydrocarbons (DRO and/or RRO), heavy metals (arsenic, lead, and/or vanadium), VOCs (benzene), and/or PAHs (naphthalene) above ADEC Groundwater Cleanup Levels.

2.8 SITE REGULATORY STATUS

The Pump Station J Site is not active and does not currently generate hazardous waste and would currently be considered a conditionally exempt small quantity generator (CESQG) under Resource Conservation Recovery Act (RCRA) regulations. Planned field activities are not expected to generate regulated waste materials. If non-exempt hazardous waste materials are generated in volumes that exceed the CESQG limit of 100 kilograms (220 pounds) during any one calendar month, then the site will become either a small or large quantity generator based on the volume of hazardous waste generated. If the CESQG limit of hazardous waste generated at the site is exceeded, then a unique EPA ID No. will be required prior to the shipping of any hazardous waste off-site.

3.0 OBJECTIVES AND SCOPE OF WORK

The objective of the project is to demolish and remove concrete building foundations and footings that are currently present at the Pump Station J site. A total of three concrete foundations have been identified as being present at the site and their locations are shown on Figure 3. Table 3-1 lists the concrete foundations scoped for removal.

Table 3-1 Concrete Foundation Estimated Volume and Weights

Foundation ID	Dimensions	Estimated Volume (cubic yards)	Estimated Weight (tons)
Pump Station Building	45-foot by 90-foot	252	503
Water Pump Facility 1	25-foot-diameter by 6 inches thick	9	18
Water Pump Facility 2	10-foot-diameter by 6 inches thick	1	3

Bristol anticipates the removal, transportation, and disposal of approximately 262 cubic yards of concrete debris. Concrete and associated soil samples were collected and analyzed for PCBs in 2018 (Bristol, 2018). Analytical results for PCBs were all non-detect (ND) below the method limit of detection (LOD) and below the ADEC Method Two Soil Cleanup Level for PCBs of 1.0 milligrams per kilogram (mg/Kg) for the Under 40-inch Zone for Human Health exposure pathway listed in Table B1 of Title 18 of Alaska Administrative Code Chapter 75, Section 341 (*18 AAC 75.341*) (ADEC, 2018).

Bristol will prepare planning and reporting documents to guide and to document the scoped field effort. Field notes and photographic documentation will be collected to document the removal effort.

The TNC will provide a field crew consisting of tribal employees to perform general laborer functions including brush clearing, minor site access improvements, and bear protection.

Bristol will utilize two excavators during the concrete removal. Bristol will provide a site superintendent and two excavators with operators to perform the concrete demolition and

removal. One excavator will be outfitted with a hydraulic breaker attachment for hammering and breaking up the concrete foundations. The second excavator will be outfitted with a bucket and thumb for loading concrete debris into transportation vehicles (end dumps and/or sidedump trailers). The Tok Municipal Landfill (Class III Landfill) operated by JD Refuse Service will provide disposal of the concrete demolition debris. Burnham Construction will provide transportation services from the site to the landfill. SOW task descriptions are listed in Table 3-2.

Table 3-2 SOW Task Descriptions

Task No.	Task Name and Description
1	**Project Management** – Provide overall project management including scheduling and management of project staff and coordination of vendors and subcontrators during the project.
2	**Planning** – Preparation and submittal of an *Work Plan* to guide scoped field tasks. Components of the *Work Plan* will include SOW and project objectives, debris removal activities, and Site Safety and Health Plan (SSHP). If determined to be necessary, a Traffic Control Plan (TCP) will be prepared and submitted under separate cover.
3	**Mobilization and Demobilization** – Mobilize and demobilize the project team, equipment, and supplies to and from the site.
4	**Concrete Demolition and Removal –** The primary project objective is the demolition and removal of concrete building foundations, including the anticipated removal of 262 cubic yards of non-hazardous concrete debris. Concrete debris scoped for removal includes the former pump station building foundation with dimension of 45 feet by 90 feet and which may be up to 8 feet thick in some places. Two other circular foundations (10 feet and 25 feet in diameter by 6-inches thick, respectively) associated with the former water pump facility will also be removed. Bristol anticipates the concrete will have rebar present; howver, the concrete and rebar will not be segregated during removal The concrete foundations and associated footings will be broken up using an excavator with hydraulic hammer and loaded into transportation vehicles for disposal at the Tok Municipal Landfill. TNC laborer staff will provide brush clearing, minor site access improvements, and bear protection. Field activities will be performed in accordance with Bristol's SSHP (Appendix B). Heavy equipment will be used to grade removal areas to eliminate tripping hazards; however, removal areas will not be backfilled.

Table 3-2 SOW Task Descriptions (continued)

Task No.	Task Name and Description
5	**Reporting** – Reporting of field activities will be documented in a field logbook and with photographic documentation. Bristol will prepare and submit a Concrete Demolition and Removal Report following the conclusion of the field effort. The Report will include, as a minimum, a description of the field activities, including site drawings, figures, and tables as appropriate; any deviations from the established *Work Plan* and the reasons for the deviations; a listing of material and items disposed during the removal effort, including disposal documentation.

3.1 TASK 1 – PROJECT MANAGEMENT

Bristol will provide overall project management throughout the duration of the project including:

- Bristol will provide timely and appropriate responses to all inquiries or comments received by the ADEC, TVC, and/or the USACE.
- Bristol will manage and control project performance including subcontracted services.
- Bristol will prepare and submit invoices with appropriate backup documentation and will provide schedule updates in a timely manner.
- Bristol will organize and lead a project kick-off meeting prior to the start of the planned field effort.

3.2 TASK 2 – PLANNING

Bristol will develop and submit planning documents that describe all planned work. All planning documents will comply with applicable federal and state regulations and adhere to standard regulations and guidance.

- Coordinate with several federal and State of Alaska regulatory agencies prior to field activities and during the development of the Work Plan.
- Allow a minimum of 30 days for review of draft plans.
- Attach review comments and responses to comments to the final version of the planning document (Appendix A).
- Include three bound and electronic copies (in compact disk-read only memory [CD-ROM] format) of planning document for both draft and final submittals to the

TVC. In addition, electronic copies of all planning documents will be submitted to the ADEC and to the USACE. Electronic file transfer to the USACE will be via the AMRDEC file transfer system (https://safe.amrdec.army.mil/SAFE/).

3.3 TASK 3 – MOBILIZATION AND DEMOBILIZATION

Bristol will mobilize one Site Superintendent (SS) and two heavy equipment operators from Anchorage to the site. Bristol field staff will be housed in local lodging facilities in Tok, Alaska. Once work is complete, the Bristol crew will demobilize via road system from the site back to Anchorage. Heavy equipment (excavators) will be mobilized to and from site via the Alaska road system. Excavators will be mobilized to the site from Anchorage or Delta Junction, Alaska.

3.4 TASK 4 – CONCRETE DEMOLITION AND REMOVAL

The TVC and Bristol will perform the demolition, removal, transportation, and disposal of the concrete building foundations and pads. Bristol anticipate that up to 262 cubic yards of inert, non-hazardous concrete debris will be demolished and removed from the site. The concrete demolition and removal crew will focus on the removal of concrete foundations and will avoid soil disturbance of known areas of surface contamination. Site restoration following concrete demolition and removal, will consist of the minimum amount of grading necessary to alleviate tripping and falling hazards. Care will be taken to avoid areas with petroleum-contaminated soil and the site will not be backfilled.

The SS/Site Safety and Health Officer (SSHO) will oversee and guide all demolition removal activities. The SS will implement procedures for heavy equipment use that accomplishes project goals while maintaining a safe work environment. Field operations performed by heavy equipment operators, excavators, and heavy truck operation, will be guided by the SS/SSHO. Although not anticipated, debris items will be inspected for the presence of hazardous materials prior to offsite transportation and disposal. The surrounding ground surface will also be inspected for any indication of adverse

environmental impacts. Surface debris will be consolidated and loaded into dump trucks and/or sidedumps prior to offsite transportation and disposal. Brush clearing and minor site access improvements may be necessary to access surface debris items. The SSHO is responsible and accountable to provide daily safety coverage on site. Any safety issues that may arise will be brought to the attention of the SSHO, and a determination will be made about what action needs to take place.

3.5 TASK 5 – REPORTING

Bristol will prepare and submit a draft and final Concrete Demolition and Removal Report detailing the completion of all field tasks. The report will include information related to and generated by field activities:

- A description of the field activities, including site drawings, figures, and tables as appropriate.
- Deviations from the established Work Plan and the reasons for the deviations.
- A listing of material and items disposed during the removal action, including transportation and disposal documentation.
- Field notes and photographs documenting site activities.
- Review comments and responses to comments to the final version of the reporting document.
- Include three bound and electronic copies (in CD-ROM format) of reporting document for both draft and final submittals to TVC. In addition, electronic copies of all planning documents will be submitted to the ADEC and the USACE. Electronic file transfer to the USACE will be via the AMRDEC file transfer system (https://safe.amrdec.army.mil/SAFE/).

3.6 PROJECT ORGANIZATION AND RESPONSIBILITIES

The fieldwork will be coordinated and conducted jointly by Bristol and the TVC. Bristol will provide job shadowing opportunities to TVC personnel in order to train and expose them to removal action procedures and practices. Key personnel are described below.

3.6.1 TVC Personnel

TVC NALEMP Coordinator

The TVC NALEMP Coordinator, Patricia Young, is responsible for ensuring that all tasks for the SOW are achieved successfully. The TVC NALEMP Coordinator will oversee and coordinate the scoped removal action effort, and provide the necessary TVC resources to meet the project objectives and requirements.

TVC Field Representative(s)

The TVC field representative(s) will contribute his/her/their knowledge of the history of the DoD activities impacting the NVT. TVC field laborers will perform brush clearing, minor site access improvements, and will provide bear protection during the field effort. TVC field representatives will work with Bristol to successfully execute the project SOW.

3.6.2 Bristol Personnel

Project Manager

The Bristol Project Manager (PM), Tyler Ellingboe, will be responsible for implementation of the project, and will have authority to commit Bristol resources necessary to meet project objectives and requirements. The primary function of the project manager is to work with the TVC NALEMP Coordinator to ensure that all technical, financial, and scheduling objectives of the project are achieved successfully. The project manager will be the primary point of contact for technical project-related matters.

Site Superintendent/Site Safety and Health Officer

The SS has yet to be determined, but will be either Eric Barnhill, Robert Schlosser, or Shane Burgess. The SS will oversee and guide all excavation and removal activities. The SS will implement procedures for heavy equipment use that accomplish project goals while maintaining a safe work environment. Field operations performed by heavy equipment operators, including excavator and heavy truck operation, will be guided by the SS.

The SS will also serve as the SSHO. The SSHO is responsible and accountable to provide daily safety coverage on site. Any safety issues that may arise will be brought to the attention of the SSHO, and a determination will be made about what action needs to take place.

First-Aid/Cardiopulmonary Resuscitation Personnel

All Bristol full-time employees who perform fieldwork are required to maintain certification in first aid/cardiopulmonary resuscitation (CPR). These personnel have received training in universal precautions and the use of personal protective equipment (PPE), as required by the Occupational Safety and Health Administration (OSHA) bloodborne pathogen standard found in Title *29 of the Code of Federal Regulations (CFR), Part 1910.1030*. At least two of these staff members will always be available to render first aid at the project site, if required.

Resumes for known and/or anticipated key Bristol project personnel are included in Appendix C.

3.6.3 USACE Personnel

The USACE NALEMP Program Manager, Andrea Elconin, will be responsible for ensuring that all project requirements are met. Ms. Elconin will coordinate the USACE effort and ensure project compliance with the NALEMP program.

3.6.4 Subcontractor/Key Vendor Services

The use of subcontractors and key vendors will be vital to successful project completion. Below is a listing of key subcontractors and a description of the services that they will provide. Subcontractors will be used as required, and will perform all work in accordance with this Work Plan.

Table 3-3 Key Subcontractors and/or Vendors

Subcontractor/Vendor	Services Provided
Burnham Construction DBA JD Refuse	Transportation and Disposal Services
Airport Equipment Rentals (AER)	Heavy Equipment Rental
Bristol Industries, LLC	Equipment Rental

The Tok Municipal Landfill, operated by Burnham Construction DBA JD Refuse is a Class III permitted landfill that will be used for the disposal of concrete demolition debris. The landfill is located at Milepost 120.2 on the Tok Cutoff Highway near Tok, Alaska.

3.7 SCHEDULE

The work proposed under this Work Plan is will be performed during the 2019 field season. The field effort is anticipated to be performed during the month of June 2019. Mobilization and demobilization will require approximately one day each. An initial site reconnaissance visit and brush clearing/minor site access activities will be performed prior to and during the scoped removal action field effort. The concrete demolition and removal field effort is anticipated to take approximately two weeks.

4.0 CONCRETE DEMOLITION AND REMOVAL FIELD ACTIVITIES

This section discusses the concrete demolition and removal field activities planned for the Pump Station J site. Planned field activities include:

- Mobilization and demobilization;
- Pre-construction permits and notifications;
- Documentation;
- Brush removal, minor site access improvements, and bear protection;
  Concrete foundation demolition and removal; and
- Site restoration

4.1 MOBILIZATION AND DEMOBILIZATION

The Bristol field crew will consist of a SS who will also serve as the SSHO. The SS will be accompanied by two Bristol heavy equipment operators. The TVC will also provide laborers to support the concrete removal effort. All crew will have current 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) certificates. The Bristol field crew and various small tools and support equipment will mobilize from Anchorage, Alaska to Tok, Alaska, and then to and from the project site utilizing the Alaska road system. Personnel will be housed in lodging facilities located near Tok, Alaska. The primary heavy equipment (two excavators) will be mobilized to the site from Anchorage or Delta Junction, Alaska.

4.2 PRE-CONSTRUCTION PERMITS AND NOTIFICATIONS

All required pre-construction permits and notifications will be completed prior to mobilization to the site. Permits and notifications which may be required include, but are not limited to, land use permits, special use permits, right-of entry permits, and utility locates. Copies of all permits and notifications required for the project will be included in the Concrete Demolition and Removal Report.

4.2.1 Permits

The TVC NALEMP Coordinator will ensure that rights-of-entry or permission from the property owners are obtained prior to commencing fieldwork.

Bristol will also complete and submit an *ADEC Transport, Treatment, and Disposal Approval Form for Contaminated Media* to the ADEC PM if contaminated media is encountered during the field effort. Offsite transportation and disposal if impacted media will not occur until the form has been reviewed and approved by the ADEC PM.

Impact to the site is expected to be well under one acre and a Storm Water Pollution Prevention Plan (SWPPP) is not required by Alaska State statute.

4.2.2 Notifications

Utility locates are not anticipated to be required or performed since no utilities are present at the site and since the concrete removal areas are located well away from the highway road corridor and highway right-of way. Previous utility locates performed at the site have identified that utilities are not present.

4.3 DOCUMENTATION

Field activities will be carefully documented for all tasks. All field activities will be recorded in a Rite in the Rain all-weather field notebook. Dates, times, field personnel present, field tasks performed, and field observations will be recorded in a field notebook. Photographs will be taken and logged in the field notebook. The SS/SSHO will conduct and document tailgate safety meetings prior to the start of each field day.

4.4 BRUSH REMOVAL, MINOR SITE ACCESS IMPROVEMENTS, AND BEAR PROTECTION

TVC tribal employees will perform any required brush removal, minor site access improvements, and/or hand-picking of small debris, as applicable. The concrete foundations are already fairly accessible; therefore, required brush removal and site access

improvements are anticipated to be limited. Brush and or surface debris may be hauled to the local wood lot or may be hauled to the Tok Landfill, as necessary.

Although potential bear encounters are unlikely due to the noise associated with heavy equipment use, the TVC employees will provide bear protection during the field effort as a precaution since brown bears are known to inhabit the area.

4.5 CONCRETE FOUNDATIONS DEMOLITION AND REMOVAL

The SS will direct Bristol equipment operators and TVC tribal employees in demolition, removal, and disposal of the concrete building foundations and anticipated 262 cubic yards of inert, non-hazardous concrete debris. The concrete debris will be generated from the demolition of a main pump station building pad as well as from the two additional circular foundations related to the facilities former well pump infrastructure.

Bristol will use the two excavators and end dump/sidedump truck for the removal and offsite transportation of concrete debris. One excavator will be outfitted with a hydraulic breaker attachment for hammering and breaking up the concrete foundations. The second excavator will be outfitted with a bucket and thumb for removing and consolidating the concrete debris into staging piles prior to loading and offsite transportation. The current concrete foundation locations and proposed concrete debris staging locations are shown on Figure 3. An anticipated truck site traffic route is also noted on Figure 3.

Concrete debris will be loaded from staging piles into end dumps and/or sidedump trailers for offsite transport to the Tok Class III Municipal Landfill operated by JD Refuse. Burnham Construction DBA JD Refuse will provide transportation over the road transportation from the site to the landfill. All loads will be documented and weights and/or cubic yardages will be provided for each load. Copies of all transportation and disposal paperwork will be provided in the Concrete Demolition and Removal Report.

Investigation-derived waste (IDW) materials are not anticipated to be generated during the concrete demolition and removal field effort since the SOW primarily entails the removal of concrete building foundations. However, any suspect waste items that are generated will be containerized into approved shipping containers and properly characterized prior to any offsite transportation and disposal. Waste items, if generated, will be disposed of at a properly permitted facility.

The concrete demolition and removal crew will focus on the removal of concrete foundations and will avoid soil disturbance of known areas of surface contamination. Care will be taken to avoid surface soils with known and/or yet to be determined petroleum-contaminated soil.

The SS and other field staff will document any adverse impacts that may be observed during the concrete demolition field effort. Potential impacts may include stained soil or soil which appears to be impacted by petroleum or other contaminants. Visual and olfactory observations will be documented with photographs and in the field notebook. Suspected impacts will be further investigated during future site investigation(s).

4.6 SITE RESTORATION

Site restoration following the removal of the concrete building foundations is anticipated to be limited to grading of the removal areas to remove depressions and to match adjacent ground contours. Minor grading may be performed in order to mitigate tripping and/or falling hazards. Additional fill material may be required; however, any required backfilling effort will be performed at a later date following any subsequent site investigation efforts.

5.0 REPORTING

Bristol will prepare and submit draft and final versions of a Concrete Demolition and Removal Report to document the performance and completion of the scoped field effort. The report will be submitted to the ADEC and USACE for review and comment. The reports will include photographs, figures showing key site features, copies of field notes and transportation/disposal paperwork, documentation of additional adverse impacts, if encountered, and conclusions and recommendations.

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6.0 REFERENCES

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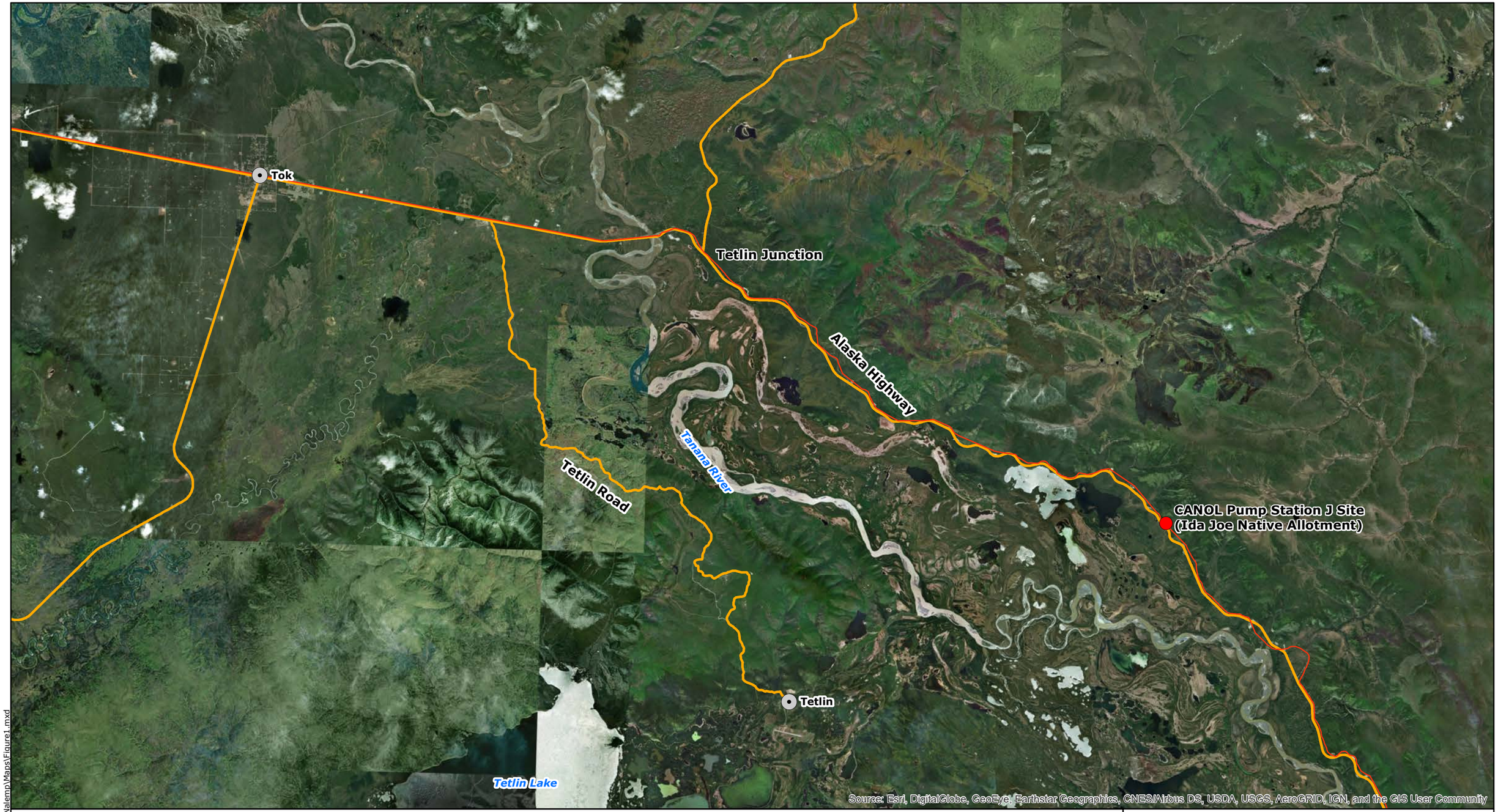
FIGURES



Legend

- Site Location
- Towns
- CANOL Pipeline
- Major Roads

0 1.25 2.5
Miles

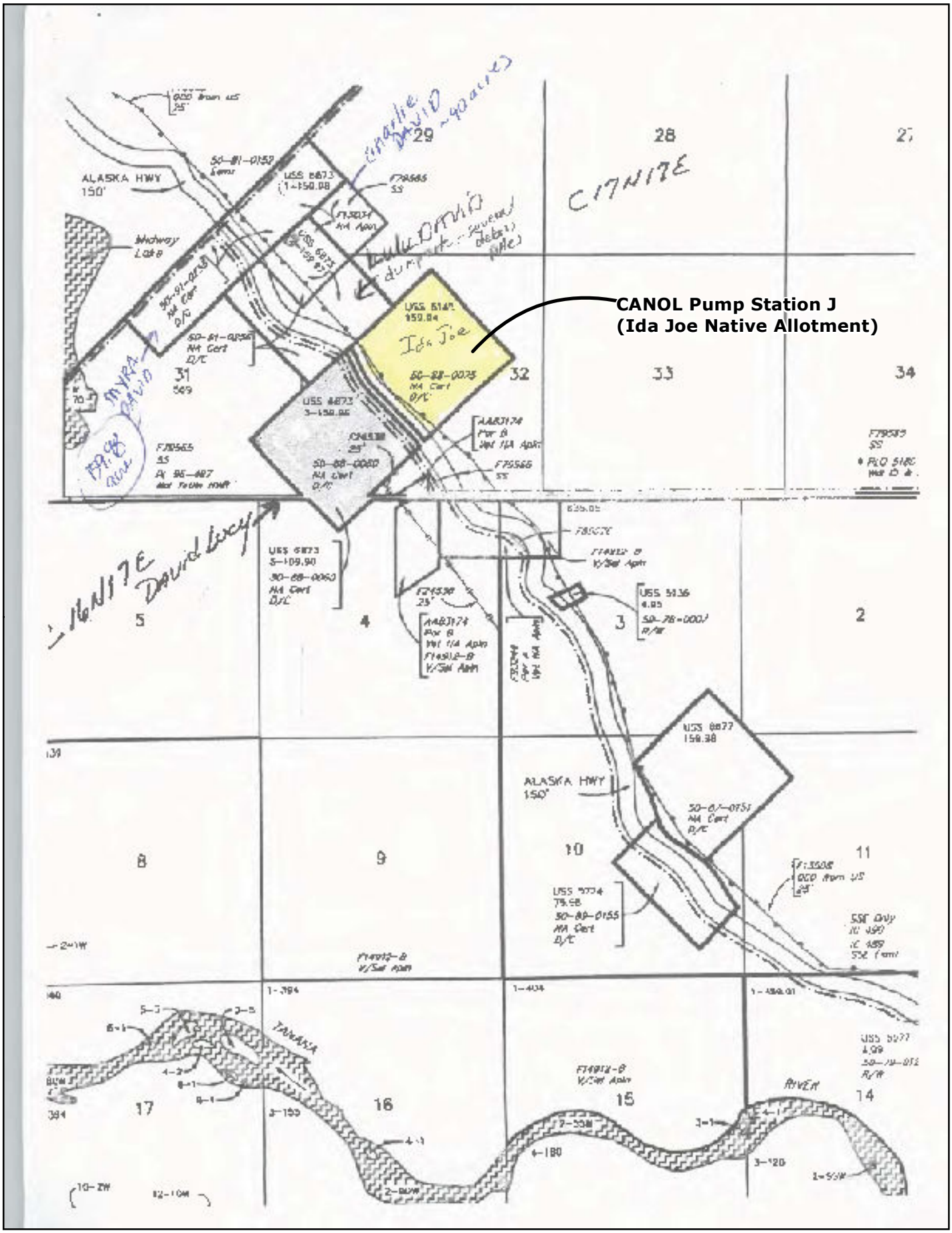
N
W E
S

FIGURE 1
TETLIN NALEMP
CANOL PUMP STATION J SITE
SITE VICINITY AND LOCATION MAP

Bristol
ENVIRONMENTAL REMEDIATION SERVICES, LLC
Phone (907)563-0013 Fax (907)563-6713
Project No. 34190039

DATUM:	DATE 01/14/2019	SHEET
NAD83	DWN. AMG	1
PROJECTION:	SCALE 1" = 2.5 mi	of
UTM Zone 7N	APPRVD. TE	1

Path: G:\Jobs\34190039_Tetlin_Nalemp\Maps\Figure1.mxd



Bristol

ENVIRONMENTAL
REMEDIATION SERVICES, LLC

Phone (907)563-0013 Fax (907)563-6713

Figure 2
TETLIN NALEMP
CANOL PUMP STATION J
NATIVE ALLOTMENT MAP
Project No.
34190039

Document Path: G:\Jobs\34190039_Tetlin_Nalemp\Concrete Deomolition and Removal Workplan\Maps\Figure3.mxd

Notes:
A southwest image shift is present resulting in a difference in location bewteen GPS features and image features (GPS locations are accurate).

Legend

- Drinking Water Well
- Truck Traffic Route
- Staging Area
- Brush Clearing/Site Access Improvement Area
- Concrete Foundation
- Former Building Foundation
- Pond
- Wetland

FIGURE 3
TETLIN, NALEMP
CANOL PUMP STATION J SITE
CONCRETE FOUNDATION REMOVAL MAP

Bristol
ENVIRONMENTAL REMEDIATION SERVICES, LLC
Phone (907)563-0013 Fax (907)563-6713

DATUM:	NAD83
PROJECTION:	SP AK Z2 FT
Project No.	34190039
DATE:	2/21/2019
DWN.	NAP
SCALE	1" = 50'
APPRVD.	te
SHEET	1 of 1

APPENDIX A

Responses to Draft Work Plan Comments and
ADEC Work Plan Approval Letter

REVIEW COMMENTS **PROJECT: Native Village of Tetlin NALEMP**
DOCUMENT: Draft Concrete Demolition and Removal Workplan, Feb. 2019

U.S. ARMY CORPS OF ENGINEERS	**DATE: 3/3/19** **REVIEWER: Andrea Elconin** **PHONE: 753-5680**	**Action taken on comment by:** Tyler Ellingboe, Bristol Project Manager, 24 March 2019 tellingboe@bristol-companeis.com (907) 743-9307

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1.	Title page	Please change subtitle to, "Pump Station J (Ida Joe Native Allotment), Canadian Oil (CANOL) Pipeline No. 4 (FUDS #F10AK1033), Vicinity of Midway Lake, Alaska"	A	Amended work plan title as per comment.	A
2.	Sec. 1, 2nd para	1st sentence, delete, "American Northern."	A	Amended 1st sentence of 2nd paragraph of Section 1.0 as per comment.	A
3.	Sec. 2.6.1	3rd bullet. Add at the end, "It also withdrew a strip of land 10 feet on either side of CANOL No. 4 pipeline constructed parallel to the Alaska Highway, withdrew 60 acres for Pump Station J."	A	Amended 3rd bullet of Section 2.6.1 as per comment.	A
4.	Sec. 2.6.1	4th bullet, Add to the end, "The land was transferred back to the Bureau of Land Management (BLM)."	A	Amended 4th bullet of Section 2.6.1 as per comment.	A
5.	Sec. 2.6.1	Delete last paragraph.	A	Deleted last paragraph of Section 2.6.1 as per comment	A
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
		----- End of Comments ----			

THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Environmental Conservation
SPILL PREVENTION & RESPONSE
Contaminated Sites Program

610 University Avenue
Fairbanks, Alaska 99709
Main: 907.451.2143
Fax: 907.451.2155
www.dec.alaska.gov

File: 170.38.034

March 21, 2019

Patricia Young
Tetlin Village Council
PO Box 797
Tok, AK 99780

RE: DEC Approval - Concrete Demolition and Removal Work Plan - Pump Station J, CANOL

Dear Ms. Young:

Thank you for providing the Concrete Demolition and Removal Work Plan for Pump Station J to the Alaska Department of Environmental Conservation (DEC). This work plan details the demolition and removal of former concrete building foundations at the former Canadian American Northern Oil Line (CANOL) Pump Station J Site. DEC has reviewed this work plan and it is approved with the following notes.

- Please avoid soils disturbance at areas of known surface contamination.
- Please also ensure if grading is necessary after concrete demolition and removal, that known contaminated soil is not impacted.
- DEC recommends follow through on Comment #1 from the 2018 Site Assessment during this field effort, which is to secure the onsite well with a cap and lock.

Please provide a final copy of the work plan when prepared and let me know if you have any questions or concerns at grethen.caudill@alaska.gov or (907) 451-2370.

Sincerely,

Gretchen Caudill
Environmental Program Specialist

cc (via email): Andrea Elconin, USACE
Tyler Ellingboe, Bristol ERS

APPENDIX B

Site Safety and Health Plan

CONCRETE DEMOLITION AND REMOVAL WORK PLAN

APPENDIX B
SITE SAFETY AND HEALTH PLAN

Final (Revision 1)

Pump Station J (Ida Joe Native Allotment), Canadian Oil (CANOL)
Pipeline Project No. 4
(Formerly Used Defense Site [FUDS] No. F10AK1033):
Vicinity of Midway Lake, Alaska

March 2019

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Attachment 2 Bristol Risk Assessment Program (BRAP) Tool

Attachment 3 Physical Agent Data Sheets

Attachment 4 Emergency Contact Information

Attachment 5 Incident Report Form

ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
BRAP	Bristol Risk Assessment Program Tool
Bristol	Bristol Environmental Remediation Services, LLC
CFR	Code of Federal Regulations
HAZWOPER	Hazardous Waste Operations and Emergency Response
JHA	Job Hazard Analysis
NALEMP	Native American Lands Environmental Mitigation Program
OSHA	Occupational Safety & Health Administration
PPE	personal protective equipment
ROPS	rollover protection system
SDS	Safety Data Sheet
SI	Site Investigation
SS	Site Superintendent
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TVC	Tetlin Village Council

1.0 INTRODUCTION

This Site Safety and Health Plan (SSHP) has been prepared by Bristol Environmental Remediation Services, LLC (Bristol), as a control mechanism for the work to be performed during the planned concrete demolition and removal effort to be conducted at the Canadian American Northern Oil Line (CANOL) Pump Station J site (Pump Station J site) near Tetlin, Alaska. This SSHP is Appendix B to the Concrete Demolition and Removal Work Plan (Work Plan).

Tetlin Village Council (TVC) field staff, under the Native American Lands Environmental Mitigation Program (NALEMP), will perform the work along with project support from Bristol. The TVC NALEMP Coordinator and their appointed personnel will provide assistance during the planned concrete demolition and removal effort. Concrete demolition and removal activities are further discussed in the main body of the Work Plan. TVC personnel will primarily perform any required brush clearing, minor site access improvements, and will support surface debris removal. All identified work will be taking place on land owned by Ms. Ida Joe and under the supervision of the TVC.

All field personnel are required to read and understand the SSHP. Personnel assigned field tasks for this project must agree to abide by the SSHP by signing the Field Team Review Form located in section 12.0 of this plan.

Safety and health guidelines and requirements are based on a review of available information concerning hazards expected to exist at the work site. The SSHP identifies health and safety procedures and equipment required to minimize the potential for deleterious occupational exposures and injuries. The SSHP may be modified by the Bristol Project Manager and/or the Site Safety and Health Officer (SSHO)/Field Manager, should additional information concerning potential hazards be obtained.

The purpose of the SSHP is to address chemical, biological, and physical hazards likely to be encountered at the project sites during field activities. This SSHP is based on the requirements of *Title 29 Code of Federal Regulations (CFR), Part 1910.120 (29 CFR 1910.120)* and *29 CFR 1926.65*.

2.0 GENERAL ACTIVITIES

Concrete demolition and removal activities will consist of the following:

- Project management;
- Work plan preparation;
- Mobilization to and demobilization to and from the Pump Station J site;
- Site reconnaissance and documentation of visible ground surface impacts;
- Brush clearing (if needed) to improve access to removal action areas at the site;
- Demolition and removal of three concrete pads, including the main pad with dimensions of 90 feet by 45 feet and a thickness of up to 8 feet, and two additional round foundations with 10 foot and 25 foot diameters;
- Transportation and disposal of concrete debris and woody debris;
- Site restoration; and
- Reporting.

2.1 ORGANIZATION AND RESPONSIBILITIES

Project organization and key personnel responsibilities under this plan are described below.

2.1.1 Project Management

Bristol Project Manager

Bristol is managing concrete demolition and removal field activities in support of the TVC. The Bristol Project Manager will be responsible for supplying all field investigation equipment and non-TVC personnel.

Bristol Site Superintendent

The Bristol Site Superintendent (SS) is primarily responsible for implementing the safety program at the project on a daily basis. The SS has direct control of the field crew. This means they also have the most direct control of the safety program in the field. The importance of the SS's safety efforts cannot be overstated.

Bristol Site Safety and Health Officer

The SSHO will be responsible for field implementation of the SSHP. The SSHO's responsibilities include communicating site requirements to personnel, field observation and monitoring of safety conditions, consultation with the Health and Safety Manager regarding appropriate changes to the SSHP, and implementation of plan requirements and contingencies in response to changing field conditions. This individual will be responsible for the implementation and verification of compliance with the SSHP. The SSHO has the authority to stop work when it is determined that injury is likely to occur because of existing work conditions.

TVC NALEMP Coordinator

The TVC NALEMP Coordinator will oversee all site reconnaissance, brush clearing, and minor site access improvement field activities prior to Bristol's arrival on-site. The TVC NALEMP Coordinator will provide and supervise all TVC personnel. The TVC NALEMP Coordinator will also provide additional workers and equipment necessary to perform site activities, as required.

2.1.2 Additional Site Personnel

All site personnel, including subcontractors, are responsible for following safety and health rules and regulations, following respective company policies, and adhering to the SSHP. Site workers will be instructed to immediately report unsafe conditions, accidents, exposures, and injuries to the SSHO. A morning safety briefing will be held daily and each site worker will sign a Daily Safety Meeting Sheet (Attachment 1).

Site-specific hazard communication training will be held at the start of the project. Site workers are responsible for reading, understanding, and signing the SSHP.

Subcontractors

The SSHO is responsible for providing subcontractors with information on expected hazards and SSHPs. Subcontractors are required to conform to the minimum requirements

of the SSHP. Subcontractors may use additional health and safety measures at their discretion. Training, medical surveillance, and personal protective equipment (PPE) used by the subcontractor will be provided by the subcontractor. Upon request, documentation of subcontractor training and medical surveillance will be provided by the subcontractor and retained on file by Bristol.

Visitors

During the course of field activities, visitors may come to the site. All visitors will be required to comply with applicable portions of this SSHP, check in with the SSHO before entering site work areas. The SSHO will conduct a brief safety and health training session to communicate the general hazards and emergency procedures associated with the site. All visitors must sign the Site Control Log and Daily Safety Meeting Sheet as an acknowledgment of having received a safety briefing.

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3.0 HAZARD ASSESSMENT

Potential hazards inherent to site activities are identified for developing and describing strategies for job safety. This section describes the types of hazards that may be encountered, and the controls that will be used to control or eliminate those hazards.

At the beginning of each day, or prior to starting a new task, each worker is required to participate in the completion of a Bristol Risk Assessment Program (BRAP) Tool. The BRAP Tool is essentially a task specific Job Hazard Analysis (JHA). BRAP Tools may be completed individually, if only a single person will be working on a task, or collectively as a work crew. The BRAP Tool form is provided in Attachment 2. A BRAP Tool is an effective method for ensuring all crew members understand the steps in the work task, are reminded of the hazards, and verify that the necessary controls are in place. In a BRAP Tool, the workers list the steps in the task to be performed, then list the hazards associated with the task (using the JHA as a reference as needed), and finally list the key preventative measures to be implemented to mitigate the hazard. The BRAP Tool will be revised in the course of the day's work as necessary when unforeseen circumstances arise or site conditions change.

3.1 CHEMICAL HAZARDS

Chemical hazards anticipated on this project include possible exposure to lead, petroleum products (gasoline or diesel), petroleum vapors, and fuel-related volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs). The primary route of entry of site contaminants are through inhalation, skin absorption, and/or through ingestion. The primary route of entry of petroleum vapors is through inhalation. Safety Data Sheets (SDS) for the identified chemical hazards will be provided to the site workers to review during site-specific hazard communication training.

Health effects from identified chemical hazards vary from acute to chronic, based on tabulated data from Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health. Proper PPE and ambient air monitoring should provide adequate protection against on-site chemical hazards.

Decontamination procedures will be performed to protect people both on and off site, and to minimize the spread of petroleum contamination.

3.1.1 Equipment Decontamination

Decontamination of large equipment, if required, will involve brushing and sweeping off the equipment, followed by a soap wash and rinse or pressure wash, if obvious staining is present. Hand tools and other items may remain in contaminated areas until the task is complete. Full decontamination of tools and equipment may or may not be necessary until the project is completed, depending on the sequence of work activities. The SSHO will establish exclusion zones and contamination-reduction zones, as needed. Subcontractors, as well as TVC operators, are responsible for decontamination of equipment and will perform decontamination to the satisfaction of the SSHO.

Safety procedures related to pressure washing include the following:

- Never point a pressure washer at yourself or others;
- Never attempt to push or move objects with spray from the washer;
- Wear eye, ear, and/or full face protection;
- Utilize rubber-soled shoes and rubber gloves.

3.1.2 Personnel Decontamination

Level D PPE, at a minimum, will always be worn. Should site conditions require personnel to come into contact with contaminated materials, the SSHO will determine if higher levels of PPE will be required. Decontamination methods for equipment and personnel will be monitored by the SSHO to determine their effectiveness. Full-body protection with inner and outer suits, gloves, boots, and respiratory protection is not

anticipated for any operations during the site reconnaissance and investigation. Decontamination operations will require that site personnel minimize contact with cleaning solutions by wearing eye protection, rubber gloves, and splash suits, as appropriate. If full-body PPE is required for some site operations, the sequence of clothing removal will be as follows:

1. Brush or scrape gross contaminants off boots.
2. Wash and rinse outer boot.
3. Wash and rinse outer glove.
4. Remove, wash, and rinse suit.
5. Remove outer boot.
6. Remove outer glove.
7. Remove suit.
8. Remove inner glove.
9. Perform personal shower and clothing change.

If gross contamination results from an unexpected release of a hazardous material, decontamination will involve the immediate removal of contaminants that may have contacted skin or eyes, or breached outer clothing.

3.2 PHYSICAL HAZARDS

The potential physical hazards associated with this project include: unstable footing conditions, movement of debris/drums/containers, movement of heavy equipment, noise, and adverse weather. Physical Agent Data Sheets (PADS) are included in Attachment 3.

3.2.1 Unstable Footing Conditions

Workers are anticipated to encounter unstable footing conditions (slipping and/or tripping and/or falling) during field operations at the site. The potential hazards related to slipping, tripping, or falling associated with this site include the following:

- Uneven terrain;
- Concrete and other miscellaneous debris;
- Tree roots and limbs
- Slippery soil and rocks; and
- Standing water.

3.2.2 Movement of Concrete Debris

Concrete debris, after removal by heavy machinery, will be placed in temporary staging areas. Temporarily staged concrete debris will then be loaded into end dump and/or sidedump trucks contracted from Burnham Construction. Concrete will be transported and disposed of at the Tok Municipal Landfill. Concrete scoped for removal was previously sampled during the 2018 field season and characterized as being inert, non-hazardous debris.

The potential hazards related to these activities include the following:

- Overexertion during lifting and moving – initial brush clearing, minor site access improvements, and incidental debris removal will require the TVC field crew laborers to be exposed to physical dangers related to lifting and moving debris items; and
- Pinching or mashing of fingers or toes during movement.

Workers will be instructed in proper lifting techniques to minimize risk of back injury or other strains/sprains. Heavy lifting will be performed on level ground, by two-man teams, or in some instances, special lifting/transport equipment (power tailgate, drum caddy, etc.) may be used. Heavy lifting and movement will be performed by heavy equipment whenever possible. Personnel will move clear of containers prior to lifting/moving using the heavy equipment.

3.2.3 Heavy Equipment and Vehicle Operation

Heavy equipment will be used on this project. There is a potential for workers to be struck by these vehicles, or to be injured by contact with exposed mechanical parts. In addition,

there is a risk of vehicle accidents and of fire during refueling. To control these hazards, regulated work areas will be established around each job site, and safe distances will be maintained between workers and mechanical equipment.

All equipment and vehicles brought to the job site will be inspected for structural integrity, cleanliness, operational performance, and proper functioning of safety devices in accordance with the manufacturer's specifications before being put into service. Equipment not conforming to operational and safety requirements will be repaired and re-inspected. Daily inspections of vehicles and heavy equipment will follow the requirements of the equipment manufacturer.

3.2.4 Operator Qualifications

Equipment operators must be qualified to operate the specific type of equipment or vehicle to which each has been assigned. In addition, each operator must be proficient in the type of equipment he/she will be using. Equipment operators may also be required to be certified to operate certain types of OSHA-regulated vehicles, such as forklifts.

3.2.5 Equipment and Vehicle Safe Work Practices

Operators, drivers, and passengers must wear seat belts at all times. Operators must wear complete Level D PPE at all times, except that hard hats may be removed (but immediately accessible) when the operator is within a fully functional rollover protection system (ROPS). The operator must immediately don her or his hard hat upon leaving ROPS. Drivers and operators must have a valid driver's license and must comply with state regulations governing the safe and legal operation of vehicles. Each driver is responsible for ensuring that passengers are seated and properly secured before moving the vehicle. Under no circumstance will personnel ride on fenders, running boards, or vehicle tops; in buckets; on beds of dump trucks or pickup trucks; or in any other area where a passenger cannot be secured by a properly installed seat belt. Operators of heavy

equipment must follow the regulations specific to the types of equipment they are operating. Operators and drivers will obey signs, postings, and instructions.

Those personnel directly involved with spotting for an operator are typically the personnel allowed on the ground in the vicinity of the heavy equipment. Other personnel will remain a safe distance away from operations. Personnel needing to approach heavy equipment while the equipment is operating will observe the following protocols:

1. Make eye contact with the operator (and spotter).
2. Signal the operator to cease heavy equipment activity, if applicable.
3. Approach the equipment operator and inform the operator of intentions.

Prior to moving parked heavy equipment, the operator will visually inspect and walk around the vehicle to ensure that the equipment is in good condition, and that there are no personnel or objects on the ground that could be damaged by vehicle movement. Operators will use handrails and footholds for mounting and dismounting equipment (three points of contact). Operators will follow equipment start-up procedures described in the appropriate operating manual. Each operator will keep hauling equipment under positive control at all times. In case of malfunction that impairs an operator's ability to control a piece of equipment, the operator will use hydraulic systems, such as blades and brakes, and shut down the equipment until help arrives and repairs are made. Heavy equipment must have booms, forks, buckets, blades, belly pans, and any other similar part lowered to the ground when the equipment is shut off.

3.2.6 Underground Utilities

The Pump Station J site is located in semi-remote Alaska with no on-site utilities present. Previous utility locates have confirmed that underground utilities are not present on the site. In addition, overhead utility lines are not present at the site.

3.2.7 Thermal Stress

Because all planned work activities will be conducted outside, there is a risk that site workers could develop cold stress or heat stress, depending on the time of year in which field activities are performed. The likelihood of thermal illnesses occurring is dependent on environmental conditions, the level of work activity, and the personal control measures that are used to manage heat loads (work/rest cycles, use of clothing and/or cooling devices, hydration, etc.). Appropriate control measures will be taken to manage these thermal stress concerns. The SSHO, for example, may monitor ambient temperatures in the work area, track thermal workloads, and determine the need for personal protective and administrative controls. In addition, all site workers will be instructed in the recognition and control of thermal stress symptoms and in treatment procedures. To guard against cold injury, appropriate clothing and warm shelters for rest periods will be provided.

3.2.8 Wind Exposure

In windy conditions it is important to prevent heat loss from as many areas of the body as possible. Exposed limbs and head are major areas of heat loss. The trunk and the head should be warm enough so that the brain is able to command the blood vessels in the hands and feet to open up and keep the extremities warm.

3.2.9 Noise

All heavy equipment can produce hazardous noise levels in excess of 85 decibels. The SSHO will determine when potential noise exposure is hazardous, and protective measures should be taken. However, whenever heavy equipment is operating, site workers and equipment operators will use hearing protection. The primary hazard associated with noise exposure is hearing loss, which is easily preventable with proper precautions and use of PPE.

3.3 BIOLOGICAL HAZARDS

3.3.1 Bear Safety

Bears may be present at the work site and field personnel should be aware of the potential risks posed by these animals. While bear encounters are relatively unusual, and most encounters end peacefully with the bear retreating from the area, they do occur. Field personnel should be alert to signs of bear activity and the potential presence of bears in the area during performance of fieldwork. TVC personnel will provide bear protection during the field effort. The following bear-related issues should be considered:

- Bears are attracted by food odors, and are typically most active early and late in the day.
- Bears often frequent stream areas, especially when salmon are present.
- Bears will occasionally rise up on their hind legs to get a better look at a person. This usually is not indicative of a charge.
- A lowered head, sideways glances, baring of teeth, and/or huffing and barking, on the other hand, are indications of an unhappy bear, and may precede aggressive actions.
- If a bear is observed feeding on a carcass in the vicinity of a site, work will be postponed at that site until feeding has been completed.

If a bear encounter does occur, depending on the type of bear and the situation, your actions can reduce the likelihood of an unpleasant outcome. If the bear is a black bear, or a young brown bear, it may be effective to make noise and wave your arms to drive the bear off. An air horn can often be used effectively for this purpose. However, this could also increase the bear's anxiety level and increase the danger to yourself. Generally, it is best to back away from the bear slowly, if possible. Do not turn your back on the bear, and never run from a bear, as this may provoke instinctive aggression.

If the bear acts aggressively, and it appears that a charge may be imminent, mentally prepare yourself to take defensive action. Equipment may be used to shield yourself from the bear, or to defend yourself from the bear if the need arises. When and if a bear

charges, make an attempt to stand still. While this may sound difficult, the charge may be a bluff, and in any case, running from a charging bear would be ineffective. If the charging bear makes contact with you, drop to the ground and roll into a ball with your arms wrapped around your head and neck. Use any equipment available to shield yourself, especially your head and neck, from the bear. If the bear is a black bear, it may be effective to fight back aggressively. If the bear is a brown bear, it is probably best to remain as still as possible until the bear leaves.

(Intentionally blank)

4.0 SITE CONTROL

4.1 WORK ZONES

Work zones will be established for the project site. Work zones may be demarcated by barricades, orange cones, or barrier tape, as appropriate. Emergency exit routes from the work area will be determined upon arrival at the site.

(Intentionally blank)

5.0 AIR MONITORING

A photoionization detector will be available on site to detect organic vapors and assess atmospheric conditions. Inhalation hazards from petroleum vapors are unlikely to be present at the site since the scope entails concrete removal from the ground surface; however, petroleum vapors and/or petroleum-impacted soil may be encountered below the former pump station building foundation.

(Intentionally blank)

6.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment will be provided when hazard control methods are determined to be impractical or inadequate to protect the worker. By providing for the proper selection, training, use, and maintenance of PPE, worker exposure to hazardous agents can be minimized. The site hazards specific to this project regarding PPE are those associated with:

- Petroleum products and petroleum vapors;
- Physical conditions related to the type of project.

6.1 LEVEL D PPE

All site work will initially be conducted in Level D PPE. Level D PPE includes:

- Hard hats – Hard hats will comply with *American National Standards Institute (ANSI) Z89.1-1969*;
- Safety boots – Steel-toe boots are required and steel shank boots are recommended. Footwear will comply with *ANSI Z41.1-1967*;
- Hearing protection as required;
- Eye protection such as safety glasses or goggles;
- Latex/neoprene/nitrile or leather gloves; and
- Cotton or chemical/fluid-resistant coveralls and safety vests.

If site conditions change or new information becomes available, the SSHO will modify PPE requirements to address the change in site conditions. If a PPE upgrade is required, workers will be responsible for inspecting their PPE for cracks, holes, and proper fit. If any abnormalities are found, the worker shall report the defect to the SSHO. Workers also need to be aware of the limitations of provided PPE. Table 1 provides known PPE limitations for the PPE selected:

Table 1 PPE Limitations

PPE Items	Limitations
Hard Hat	Hard hats should not be painted, nor have holes drilled into them. These are considered damaged and damaged hard hats cannot protect properly. In addition, hard hats should be worn in the manner in which they were designed—not turned around backwards (bill of hard hat always faces forward).
Safety-Toe Footwear	The steel-toe shield can cause cold feet in cool weather. Heavy wool socks are helpful.
Hearing Protection	Earplugs and muffs have to be inserted or cover the ears as specified by manufacturer, or they will not protect to their maximum capability.
Eye Protection	Safety glasses may restrict the workers field of vision.
Gloves	Gloves wear out and/or get ripped and torn. Gloves also reduce finger dexterity. Daily inspections should be completed and gloves replaced if they are determined not to be in good condition.
Protective Clothing (Coveralls and Safety Vests)	Coveralls are not complete chemical barriers and will not prevent skin punctures or cuts. Coveralls also are subject to tearing, fluid absorption, and retaining body heat.

7.0 HAZARD COMMUNICATION PROGRAM *(29 CFR 1910.1200)*

The Hazard Communication Manager will be the SSHO. The Hazard Communication Program will be conducted in accordance with federal regulations. A variety of communications systems will be used for on-site and off-site communication. These include satellite phones, cellular telephones, hand signals, and posting of information.

Before starting field operations, the Bristol SSHO will coordinate with the tribal point-of-contact to establish a reliable method of communication for emergency operations. If needed, satellite telephones, walkie-talkies, etc., are available for use on site.

In case of a site emergency, workers are to remove themselves from danger, inform fellow workers, make a quick assessment of conditions, and contact the SSHO. The SSHO will contact emergency personnel required to handle the emergency condition.

7.1 HAND SIGNALS

Basic hand signals to be used on site are as follows:

Signal		Meaning
Hands On Throat	=	Out of Air / Can't Breathe
Thumb Up	=	I'm OK / I Understand
Thumb Down	=	No / Negative
Forward Crossed Wave	=	Problem / Needs Help
Grip Wrist	=	Exit Immediately

7.2 POSTING EMERGENCY INFORMATION

Emergency phone numbers will be placed in the vehicle of the SSHO. The following information will be posted or made available in the SSHO or superintendent's vehicle:

- Emergency telephone numbers for Fire Department, Police Department, and Emergency Medical Personnel;
- Name and telephone number of the SSHO.

7.3 SAFETY AND HEALTH BRIEFINGS

Safety and health briefings will be provided to workers on a task-by-task basis to address specific operations and activities, as well as daily Toolbox Safety Meetings at the start of each shift. Safety briefings will be documented as to content, date, and attendance.

8.0 TRAINING

All site workers shall be qualified to perform their designated duties, based on their experience, education, and training. Enforcement and continuous reinforcement will be implemented through daily safety meetings, and one-on-one discussion.

8.1 INITIAL AND REFRESHER TRAINING

The OSHA Regulation *29 CFR 1910.120* describes training requirements for persons working at hazardous sites. This regulation clearly identifies the level of training to be provided. Documentation of such training will be available on site. All site workers are required to complete Hazardous Waste Operations and Emergency Response (HAZWOPER) training and refresher classes, as required.

8.2 SUPERVISORS

Worker supervisors shall have an additional eight hours of health and safety training commensurate with their duties, as per *29 CFR 1910.120(e)(4)*.

8.3 PROJECT-SPECIFIC TRAINING

Project-specific training will include:

- Cardiopulmonary resuscitation/first aid (at least one person on site);
- 40-hour HAZWOPER or current eight-hour refresher.

8.4 HAZARD COMMUNICATION TRAINING

SDSs will be available to workers for each hazardous agent they might encounter. Safety briefings will include a review and location of the SDS. Any known hazardous materials that might expose the worker will be discussed prior to beginning work. SDSs will be maintained at the TVC NALEMP office.

As part of the site-specific training, the following topics will be addressed.

- The information in the SSHP;
- Communication of physical or chemical properties of any known hazards;

- Hazard communication for materials brought onto the site that were not covered at the time of start-up;
- Use, limitations, and proper fit of PPE;
- The proper donning and doffing of PPE;
- Emergency procedures, including spill prevention and response;
- Bloodborne pathogens briefing.

8.5 TRAINING DOCUMENTATION

All applicable training documents and certifications will be maintained at the NVT NALEMP office and archived after project completion.

8.6 VISITORS

Visitors are not anticipated to be involved on this project. However, if bystanders are present, they will be required to stay outside of all work zones and away from site equipment.

9.0 RECORDKEEPING AND REPORTING

Health and safety records are maintained at the Bristol corporate office to fulfill all OSHA, workers' compensation, and insurance recordkeeping requirements.

9.1 INJURY AND ILLNESS RECORDKEEPING AND REPORTING REQUIREMENTS

OSHA No. 300 - Log and Summary of Occupational Injury and Illness: This log is maintained at the Bristol corporate office. Each recorded injury or illness is entered in the log within six days after notice that a recorded case has occurred (*29 CFR 1904.2*).

Bristol Industries Incident Report Form: A copy of this report (or insurance claim report) must be available within seven days after receiving notice that a recorded case has occurred (*29 CFR 1904.4*).

OSHA Fatality and Multiple Injury Notification: The nearest OSHA office must be contacted within eight hours of being notified of an occupational fatality or multiple injuries (*29 CFR 1904.8*).

9.2 SITE SAFETY INSPECTIONS AND LOGS

Site safety inspections will be documented in the project log that will be maintained on site for the duration of the operation. This documentation will include safety inspections, work summaries, safety meetings, and incident investigations, etc.

(Intentionally blank)

10.0 MEDICAL SURVEILLANCE

Bristol will comply fully with *29 CFR 1910.120 (f)(6)* and *29 CFR 1926.65 (f)(6)* at all times.

10.1 MEDICAL PROGRAMS

The medical program administered by Bristol includes provisions and procedures for:

- Pre-employment/exit physicals as required,
- Ongoing medical surveillance,
- Hearing tests,
- Vision tests.

The specific requirements for this project include all of the above. These tests will be completed before the worker begins working on site. It is noted that the occupational physician performing the physical examination is given a list of known hazards and contaminants on the site prior to fit-for-work examination and testing.

10.2 EMERGENCY MEDICAL SURVEILLANCE

Emergency medical surveillance must be provided within 72 hours of:

- A worker being exposed to hazardous material during an emergency,
- A worker exhibiting signs and symptoms of exposure,
- A worker losing consciousness.

Any worker who receives emergency medical surveillance will not be allowed to work at the site until a physician has issued a certificate of medical fitness.

Emergency decontamination will be initiated by personnel on site as needed.

(Intentionally blank)

11.0 EMERGENCY PROCEDURES

In case of a site emergency, immediate action will be taken to protect life, property, and the environment. The following paragraphs describe the response systems and the line of communications required.

11.1 MEDICAL EMERGENCIES

First-aid kits will be made available at the site to treat injured workers requiring medical attention. Consistent with the site-specific briefing on bloodborne pathogens, care will be taken to guard against blood or other bodily fluids being transferred to another worker. Gloves and other barriers will be used.

If the medical emergency is beyond the capability of the first-aid providers, emergency medical services will be contacted by calling "911." Bristol and all site workers will be briefed on the buddy system and the importance to call for help and stay safe.

For urgent care, or if the emergency requires transportation of a worker to medical facilities by site personnel, specific directions and facility contacts are included in Attachment 4.

11.2 FIRE RESPONSE

To report a fire, call "911." The call numbers for the fire department will be verified with tribal contacts upon arrival. Bristol employees and subcontractors are not required to obtain training in firefighting.

11.3 ENVIRONMENTAL EMERGENCIES

The Site Superintendent and SSHO will assess environmental emergencies, such as leaks or spills. The tribal contact will contact the appropriate agency or authorities, as necessary. Appropriate spill response kits will be maintained on site, as necessary.

11.4 EMERGENCY INFORMATION

Emergency information will be posted at the site and will include:

Organization/Personnel	Phone Number
Fire Department	911
Police Department	911
TVC NALEMP Coordinator – Patricia Young	(907) 883-2021/(907) 940-0077
Tetlin Clinic Health Aid – Lydia David	(907) 324-2151
Bristol Project Manager – Tyler Ellingboe	(907) 563-0013/(907) 230-2757
Bristol Site Superintendent – TBD	(907) 563-0013
Bristol SSHO – To Be Determined	(907) 563-0013

Notes:
NALEMP = Native American Lands Environmental Mitigation Program
SSHO = Site Safety and Health Officer
TBD = to be determined
TVC = Tetlin Village Council

11.5 SPILL PREVENTION PROGRAM

In the event a spill is detected on site, the steps and procedures listed below must be taken to protect the health and safety of nearby persons. Workers will be expected to:

- Evacuate the area and contact the appropriate emergency response agency;
- The Response Team will initiate the emergency response plan;
- Swiftly transport any victims to the nearest medical facility for observation.

11.6 RELEASE REPORTING AND NOTIFICATION

All spills will be immediately reported to the SSHO for purposes of completing reports, and for contacting the necessary agencies. Any Regulatory Agency contacts are to be made through the TVC NALEMP Coordinator.

11.7 EVALUATING EMERGENCY PREPAREDNESS

The SSHO will contact the TVC NALEMP Coordinator in case of any emergency, and will comply with all directions given. Debriefings after any incident will include summaries from participants as to changes needed and overall critique of the plan. Changes, reviews,

and updates made to the plan may result from actual field conditions, or because of changing conditions. The Bristol Incident Report Form is included in Attachment 5.

11.8 ADVERSE WEATHER

In case of adverse weather, the SSHO will determine if work can continue without sacrificing the health and safety of field workers. Some of the items to be considered prior to determining if work should continue are:

- Extreme heat, or cold, and wind;
- Heavy precipitation;
- Limited visibility;
- Electrical storms;
- Potential for accidents.

(Intentionally blank)

12.0 FIELD TEAM REVIEW

Each Field Team member shall sign this section after site-specific training is completed, and before being permitted to work on site.

I have read and reviewed the Site Safety and Health Plan and understand the information presented. I will comply with the provisions contained therein.

Project Site:		
Signature	**Print Name**	**Date**

(Intentionally blank)

ATTACHMENT 1

Daily Safety Meeting Sheet

DAILY SAFETY MEETING SHEET

Each crew member must sign and date the following form to document attendance at the safety meeting.

Project Site:		
Signature	**Print Name**	**Date**

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

Site Control Log

Printed Name	Signature	Company	Date/Time In	Date/Time Out

ATTACHMENT 2

Bristol Risk Assessment (BRAP) Tool

Tools:

☐ Cut-Off Saw
☐ Impact Driver
☐ Powder Actuated
☐ Extension Cords
☐ Sledge Hammer
☐ Shovel / Rake / Etc
☐ Grade Checking Equipment
☐ Other

_____

_____

_____

Equipment:

☐ Backhoe
☐ Excavator
☐ Grader
☐ Dozer
☐ Loader
☐ Roller
☐ Skid Steer
☐ Fork Lift
☐ Rock Truck
☐ Side Dump
☐ Rock Crusher
☐ ATV / UTV
☐ Light Plant
☐ Jumping Jack
☐ Plate Compactor
☐ Generator
☐ Air Compressor
☐ Water Pump
☐ Ladder
☐ Other

_____

_____

BRAP Tool Reviewed By:

_____

_____

_____

_____

_____

_____

_____

_____

_____

Lead Name: _____

Date: _____

Location: _____

Project: _____

After Action

What went well?

_____

_____

Opportunity for Improvement?

_____

_____

If you have any questions or need assistance please contact:

Charity Irmen (907) 743-9398
Zach Sullivan (907) 227-6063
Rick Miles (907) 223-0256

Bristol Risk Assessment Program Tool

ENVIRONMENTAL

Report ALL Incidents and Near Miss Events!

Superintendent:

SSHO:

AXIOM: (281) 419-7063

Standard PPE

Hard Hat
Safety Toe Boots
Protective Eyewear
Reflective Vest

*** Include all workers performing the work in the development of the BRAP Tool as it is Task Specific.**

1. Tasks

List the tasks required to perform the activity in the sequence they are carried out.

_____

_____

_____

_____

_____

_____

_____

2. Hazards

Against each task list the hazards that could cause injury/incident when the task is performed.

_____

_____

_____

_____

_____

_____

_____

_____

_____

3. Controls

List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Specialized PPE

☐ Face Shield
☐ Goggles
☐ Coveralls
☐ Rubber Boots
☐ Specified Gloves
☐ Respiratory Protection
☐ Hearing Protection (Double?)
☐ Fall Protection
☐ Welding Hood
☐ Welding Gloves
☐ Chainsaw Chaps
☐ Metatarsal Guards
☐ Other_____
☐ N/A

Required Permits

☐ Confined Space
☐ Hot Work
☐ Hazardous Energy (LOTO)
☐ Excavation Checklist
☐ N/A

Safety Equipment

☐ Four Gas Meter
☐ Soil Penetrometer
☐ Radio
☐ Other_____
☐ N/A

Site Access and Control

☐ Barricades
☐ Signs Posted
☐ Caution Tape
☐ Staging Area
☐ Designated Vehicle Area
☐ Heavy Equipment Spotter
☐ Traffic Management
☐ SDSs Reviewed
☐ Other_____
☐ N/A

Buried Utilities

☐ Electrical (Red)
☐ Water (Blue)
☐ Sewer (Green)
☐ Communications (Orange)
☐ Natural Gas (Yellow)
☐ Other_____
☐ N/A

Weather: _____

Terrain: _____

Wildlife: _____

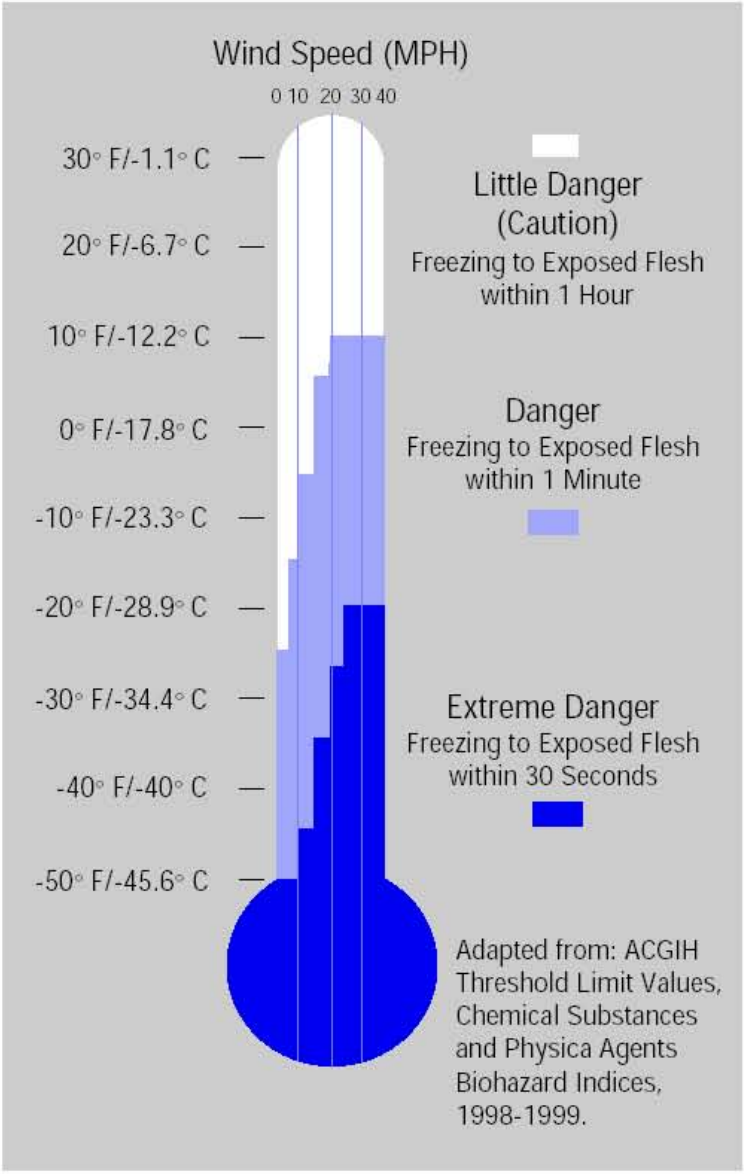
ATTACHMENT 3

Physical Agent Data Sheets

THE COLD STRESS EQUATION

LOW TEMPERATURE + WIND SPEED + WETNESS = INJURIES & ILLNESS

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. **Hypothermia** can occur when *land temperatures* are **above** freezing or *water temperatures* are below 98.6°F/ 37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



OSHA 3156
1998

FROST BITE

What Happens to the Body:

FREEZING IN DEEP LAYERS OF SKIN AND TISSUE; PALE, WAXY-WHITE SKIN COLOR; SKIN BECOMES HARD and NUMB; USUALLY AFFECTS THE FINGERS, HANDS, TOES, FEET, EARS, and NOSE.

What Should Be Done: (land temperatures)

- Move the person to a warm dry area. Don't leave the person alone.
- Remove any wet or tight clothing that may cut off blood flow to the affected area.
- **DO NOT** rub the affected area, because rubbing causes damage to the skin and tissue.
- **Gently** place the affected area in a warm (105°F) water bath and monitor the water temperature to **slowly** warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast causing tissue damage. Warming takes about 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm. **NOTE:** If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.

HYPOTHERMIA - (Medical Emergency)

What Happens to the Body:

NORMAL BODY TEMPERATURE (98.6° F/37°C) DROPS TO OR BELOW 95°F (35°C); FATIGUE OR DROWSINESS; UNCONTROLLED SHIVERING; COOL BLUISH SKIN; SLURRED SPEECH; CLUMSY MOVEMENTS; IRRITABLE, IRRATIONAL OR CONFUSED BEHAVIOR.

What Should Be Done: (land temperatures)

- Call for emergency help (i.e., Ambulance or Call 911).
- Move the person to a warm, dry area. Don't leave the person alone. Remove any wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if they are alert. **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) or alcohol.
- Have the person move their arms and legs to create muscle heat. If they are unable to do this, place warm bottles or hot packs in the arm pits, groin, neck, and head areas. **DO NOT** rub the person's body or place them in warm water bath. This may stop their heart.

What Should Be Done: (water temperatures)

- Call for emergency help (Ambulance or Call 911). Body heat is lost up to 25 times faster in water.
- **DO NOT** remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes, and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of the water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **DO NOT** attempt to swim unless a floating object or another person can be reached because swimming or other physical activity uses the body's heat and reduces survival time by about 50 percent.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.

How to Protect Workers

- Recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.
- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.
- Train the workforce about cold-induced illnesses and injuries.
- Select proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene).
- Take frequent short breaks in warm dry shelters to allow the body to warm up.
- Perform work during the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system (work in pairs).
- Drink warm, sweet beverages (sugar water, sports-type drinks). Avoid drinks with caffeine (coffee, tea, or hot chocolate) or alcohol.
- Eat warm, high-calorie foods like hot pasta dishes.

Workers Are at Increased Risk When…

- They have predisposing health conditions such as cardiovascular disease, diabetes, and hypertension.
- They take certain medication (check with your doctor, nurse, or pharmacy and ask if any medicines you are taking affect you while working in cold environments).
- They are in poor physical condition, have a poor diet, or are older.

PHYSICAL AGENT DATA SHEET (PADS)

HAND-ARM VIBRATION

Description

Hand-arm vibration is caused by the use of vibrating hand-held tools, such as pneumatic jack hammers, drills, gas powered chain saws, and electrical tools such as grinders. The nature of these tools involves vibration (a rapid back and forth type of motion) which is transmitted from the tool to the hands and arms of the person holding the tool.

Health Hazards

Vibration Syndrome and Vibration-Induced White Finger (VWF) are the major health hazards related to the use of vibrating tools. Carpal Tunnel Syndrome is another health problem that has been linked in one study to the use of smaller hand-held vibrating tools.

Vibration Syndrome

Vibration Syndrome is a group of symptoms related to the use of vibrating tools and includes -some or all of the following: muscle weakness, muscle fatigue, pain in the arms and shoulders, and vibration-induced white finger. Many researchers believe that other symptoms--headaches, irritability, depression, forgetfulness, and sleeping problems--should also be included in descriptions of Vibration Syndrome.

Vibration-Induced White Finger

Vibration-Induced White Finger (VWF), also known as "Dead Finger" or "Dead Hand" is the result of impaired circulation (poor blood supply in the fingers, caused by the prolonged use of vibrating tools. VWF may appear after only several months on the job, or may not appear until twenty to forty years on the job.

The harmful health effects of vibrating tools are related to the length of time that a worker has been using vibrating tools and to the frequency of the vibration (how fast the tool goes back and forth). The longer a person uses a vibrating tool, and the faster the tool vibrates, the greater the risk of health effects. The length of the initial symptom-free period of vibration exposure (i.e., from first exposure to the first appearance of a white finger) is known as the latent interval. It is related to the intensity of the vibration - the shorter the latent period, the more severe the resulting VWF if vibration exposure continues.

Temporary tingling or numbness during or soon after use of a vibrating hand tool is not considered to be VWF, however tingling and numbness in the fingers lasting more than an hour after finishing work may indicate early stages of VWF. Table 1 lists the stages that Vibration White Finger may progress through if exposure continues.

Table 1 Stages of Vibration White Finger (Taylor-Pelmear System)

Stage	Condition of Fingers	Work & Social Interference
00	No tingling, numbness or blanching of fingers	No complaints
OT	Intermittent tingling	No interference with activities
ON	Intermittent numbness	No interference with activities
TN	Intermittent tingling and numbness	No interference with activities
1	Blanching of a fingertip with or without tingling and/or numbness	No interference with activities
2	Blanching of one or more fingers beyond tips, usually during winter	Possible interference with activities outside work, no interference at work
3	Extensive blanching of fingers; frequent episodes in both summer and winter	Definite interference at work, at home, and with social activities; restriction of hobbies
4	Extensive blanching of most fingers; frequent episodes in both summer and winter	Occupation usually changed because of severity of signs and symptoms

The technical name for VWF is Raynaud's Syndrome of Occupational Origin. Raynaud's Syndrome may also occur in people who do not use vibrating hand-held tools. Several different kinds of medical illnesses can cause Raynaud's Syndrome. Raynaud's Syndrome also appears in some people who are otherwise entirely healthy.

It is important that people with Raynaud's Syndrome avoid the extensive use of vibrating tools because they can develop the most severe complications of VWF very quickly.

Many of the symptoms of Vibration Syndrome will disappear shortly after a worker stops using the types of tools which transmit vibration to the hands and arms. Fatigue and muscular pain in the arms and shoulders will generally disappear. In the early stages, if a worker stops using vibrating tools, VWF will not get any worse and may get slightly better.

Carpal Tunnel Syndrome

Carpal Tunnel Syndrome (CTS) is a group of symptoms in the hand which arise from pressure on one of the nerves which passes through the palm side of the wrist. The early symptoms are similar to the early symptoms of white finger and consist of tingling in the fingers. For the most part only the thumb, index, and middle fingers are affected in CTS.

Later, symptoms can progress to numbness. Pain in the wrist and fingers may also develop. CTS may occur in people using small hand tools like pneumatic screwdrivers. Carpal Tunnel Syndrome also occurs among people having repetitive motion of the wrist or fingers, such as using a cash register, or picking fish from a net; or with forceful motion of the wrist, such as in using a wrench. Pinching or flexing with the wrist bent upwards, downwards, or sideways increases the occurrence of CTS.

The symptoms of CTS are frequently worse at night and a person may be awakened from sleep by pain or the feeling of pins and needles in fingers, hand or wrist.

Carpal Tunnel Syndrome may improve if diagnosed in the early stages and exposure to the type of activity which caused it is stopped. In moderate cases most of the symptoms of CTS can be relieved by a surgical operation which relieves the pressure on the nerve which causes the CTS symptoms. If the surgery is performed too late, only some of the symptoms may be relieved. In very severe cases the symptoms are irreversible and may include weakness of the hand due to loss of muscle function.

Preventing Hand-Arm Vibration Diseases

Job Modification to Reduce Vibration Exposure

Wherever possible, jobs should be redesigned to minimize the use of hand-held vibrating tools. Where job redesign is not feasible, ways to reduce tool vibration should be found. Where practical, substitute a manual tool for a vibrating tool. Whenever possible, high vibration tools should be replaced by improved, low vibration tools designed to absorb vibration before it reaches the handgrip.

Determine vibration exposure times and introduce work breaks to avoid constant, continued vibration exposure. A worker who is using a vibrating tool continuously should take a 10 minute break after each hour of using the tool.

Medical Evaluation

Workers whose occupations place them at risk for developing VWF should have pre-employment physicals and thereafter should be checked at least annually by doctors who know about the diagnosis and treatment of VWF. Diagnostic tests which can be used include plethysmography, arteriography, skin thermography, and sensory tests,, such as two point discrimination depth sense, pinprick touch and temperature sensation. X-rays may also be useful.

Workers that have a past history of abnormalities in blood circulation and especially workers who have Raynaudis Syndrome should not be permitted to use vibrating hand-held tools. Workers who have moderate to severe symptoms of VWF should be reassigned to work which removes them from further direct exposure to vibrating tools.

If workers develop symptoms of tingling or numbness, or if their fingers occasionally become white or blue, or painful especially when cold, they should be examined by a doctor who knows about the diagnosis and treatment of VWF and CTS.

Work Practices

Workers using vibrating hand-held tools should wear multiple layers of warm gloves and should wear anti-vibration gloves whenever possible. Before starting the job, warm the hands. This is especially important when it is cold. workers using vibrating tools should not allow the hands to become chilled. If the hands of a worker using vibrating tools become wet or chilled, he should dry them and put on dry, warm gloves before resuming exposure to vibration. Workers exposed to cold should dress adequately to keep the whole body warm because low body temperature can make a worker more susceptible to VWF.

A worker using a vibrating hand-held tool should let the tool do the work by grasping it as lightly as possible, consistent with safe work practice. The tighter the tool is held, the more vibration is transmitted to the fingers and hand. The tool should rest on a support or on the workpiece as much as possible. The tool should be operated only when necessary and at the minimum speed (and impact force) to reduce vibration exposure.

Tools should be regularly maintained to keep vibration to a minimum. Keeping chisels and chainsaws sharp, for example, will reduce vibration. Using new grinder wheels will also reduce vibration.

Education

Employees who use or will be using vibrating hand-held tools should receive training about the hazards of vibration and they should be taught how to minimize the ill effects of vibration.

Smokers are much more susceptible to VWF that non-smokers, and the VWF in smokers is usually more severe, therefore workers who use vibrating hand-held tools should not smoke.

Recommended Exposure Limits

Table 2 contains the American Conference of Governmental Industrial Hygienists (ACGIH) recommendations on the limits for exposure of the hand to vibration.

Table 2 Threshold Limit Values for Exposure of the Hand to Vibration in Either X_h, Y_h, Z_h, Directions

Total Daily Exposure Duration[a]	Values of the Dominant,[b] Frequency-Weighted, rms, Component Acceleration Which Shall Not be Exceeded a_k, (a_{keg})	
	m/s^2	g[c]
4 hours and less than 8	4	0.40
2 hours and less than 4	6	0.61
1 hour and less than 2	8	0.81
less than 1 hour	12	1.22

[a] The total time vibration enters the hand per day, whether continuously or intermittently.

[b] Usually one axis of vibration is dominant over the remaining two axes. If one or more vibration axes exceeds the Total Daily Exposure then the TLV has been exceeded.

[c] g = 9.81 m/s . d

PHYSICAL AGENT DATA SHEET (PADS)

HEAT STRESS

Description

Heat stress is caused by working in hot environments like laundries, bakeries, or around boilers or incinerators. Four environmental factors affect the amount of heat stress felt by employees in hot work areas: temperature, humidity, radiant heat (such as from the sun or a furnace), and air velocity. How well or how poorly an individual reacts to heat stress is dependent on personal characteristics such as age, weight, fitness, medical condition, and acclimatization.

The body has several methods of maintaining the proper internal body temperature. When internal body temperature increases, the circulatory system reacts by increasing the amount of blood flow to the skin so the extra heat can by given off.

Sweating is another means the body uses to maintain stable internal temperatures. When sweat evaporates, cooling results. However, sweating is effective only if the humidity level is low enough to permit evaporation and if the fluids and salts lost are replaced.

Health Effects—Heat Disorders

Heat stroke, the most serious health problem for workers in hot environments is caused by the failure of the body's internal mechanism to regulate its core temperature. Sweating stops and the body can no longer rid itself of excess heat. Signs include: mental confusion, delirium, loss of consciousness, convulsions or coma; a body temperature of 106 degrees Fahrenheit or higher; and hot dry skin which may be red, mottled or bluish. Victims of heat stroke will die unless treated promptly. While medical help should be called, the victim must be removed immediately to a cool area and his/her clothing soaked with cool water. He/she should be fanned vigorously to increase cooling. Prompt first aid can prevent permanent injury to the brain and other vital organs.

Heat exhaustion develops as a result of loss of fluid through sweating when a worker has failed to drink enough fluids or take in enough salt, or both. The worker with heat exhaustion still sweats, but experiences extreme weakness or fatigue, giddiness, nausea, or headache. The skin is clammy and moist, the complexion pale or flushed, and the body temperature normal or slightly higher. Treatment is usually simple: the victim should rest in a cool place and drink salted liquids. Salt tablets are not recommended. Severe cases involving victims who vomit or lose consciousness may require longer treatment under medical supervision.

Heat cramps, painful spasms of the bone muscles, are caused when workers drink large quantities of water but fail to replace their bodies' salt loss. Tired muscles, those used for performing the work, are usually the ones most susceptible to cramps. Cramps may occur during or after working hours and may be relieved by taking salted liqids by mouth or saline solutions intravenously for quicker relief, if medically determined to be required.

Fainting may be a problem for the worker unacclimatized to a hot environment who simply stands still in the heat. Victims usually recover quickly after a brief period of lying down. Moving around, rather that standing still, will usually reduce the possibility of fainting.

Heat rash, also known as prickly heat, may occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation. When extensive or complicated by infection, heat rash can be so uncomfortable that it inhibits sleep and impairs a worker's performance or even results in temporary total disability. It can be prevented by showering, resting in a cool place, and allowing the skin to dry.

Medical Conditions Aggravated By Exposure to Heat

Persons with heart or circulatory diseases or those who are on "low salt" diets should consult with their physicians prior to working in hot environments.

Preventing Heat Disorders

One of the best ways to reduce heat stress on workers is to minimize heat in the workplace. However, there are some work environments where heat production is difficult to control, such as when furnaces or sources of steam or water are present in the work area, or when the workplace itself is outdoors and exposed to varying warm weather conditions.

Acclimatization

Humans are, to a large extent, capable of adjusting to the heat. This adjustment to heat, under normal circumstances, usually takes about 5 to 7 days, during which time the body will undergo a series of changes that will make continued exposure to heat more endurable.

On the first day of work in a hot environment, the body temperature, pulse rate, and general discomfort will be higher. With each succeeding daily exposure, all of these responses will gradually decrease, while the sweat rate will increase. When the body becomes acclimated to the heat, the worker will find it possible to perform work with less strain and distress.

Gradual exposure to heat gives the body time to become accustomed to higher environmental temperatures. Heat disorders in general are more likely to occur among workers who have not been given time to adjust to working in the heat or among workers who have been away from hot environments and who have gotten accustomed to lower temperatures. Hot weather conditions of the summer are likely to affect the worker who is not acclimatized to heat. Likewise, workers who return to work after a leisurely vacation or extended illness may be affected by the heat in the work environment. Whenever such circumstances occur, the worker should be gradually reacclimatized to the hot environment.

Lessening Stressful Conditions

Many industries have attempted to reduce the hazards of heat stress by introducing engineering controls, training workers in the recognition and prevention of heat stress, and implementing work-rest cycles. Heat stress depends, in part, on the amount of heat the worker's body produces while a job is being performed. The amount of heat produced during hard, steady work is much higher than that produced during intermittent or light work. Therefore, one way of reducing the potential for heat stress is to make the job easier or lessen its duration by providing adequate rest time. Mechanization of work procedures can often make it possible to isolate workers from the heat source (perhaps in an air-conditioned booth) and increase overall productivity by decreasing the time needed for rest. Another approach to reducing the level of heat stress is the use of engineering controls which include ventilation and heat shielding.

Number and Duration of Exposures

Rather than be exposed to heat for extended periods of time during the course of a job, workers should, wherever possible, be permitted to distribute the workload evenly over the day and incorporate work-rest cycles. Work-rest cycles give the body an opportunity to get rid of excess heat, slow down the production of internal body heat, and provide greater blood flow to the skin.

Workers employed outdoors are especially subject to weather changes. A hot spell or a rise in humidity can create overly stressful conditions. The following practices can help to reduce heat stress:

- Postponement of nonessential tasks
- Permit only those workers acclimatized to heat to perform the more strenuous tasks, or
- Provide additional workers to perform the task keeping in mind that all workers should have the physical capacity to perform the task and that they should be accustomed to the heat.

Thermal Conditions in the Workplace

A variety of engineering controls can be introduced to minimize exposure to heat. For instance, improving the insulation on a furnace wall can reduce its surface temperature and the temperature of the area around it. In a laundry room, exhaust hoods installed over those sources releasing moisture will lower the humidity in the work area. In general, the simplest and least expensive methods of reducing heat and humidity can be accomplished by:

- Opening windows in hot work areas,
- Using fans, or
- Using other methods of creating airflow such as exhaust ventilation or air blowers.

Rest Areas

Providing cool rest areas in hot work environments considerably reduces the stress of working in those environments. There is no conclusive information available on the ideal temperature for a rest area. However, a rest area with a temperature near 76 degrees Fahrenheit appears to be adequate and may even feel chilly to a hot, sweating worker, until acclimated to the cooler environment. The rest area should be as close to the workplace as possible. Individual work periods should not be lengthened in favor of prolonged rest periods. Shorter but frequent work-rest cycles are the greatest benefit to the worker.

Drinking Water

In the course of a day's work in the heat, a worker may produce as much as 2 to 3 gallons of sweat. Because so many heat disorders involve excessive dehydration of the body, it is essential that water intake during the workday be about equal to the amount of sweat produced.

Most workers exposed to hot conditions drink less fluids than needed because of an insufficient thirst drive. A worker, therefore, should not depend on thirst to signal when and how much to drink. Instead, the worker should drink 5 to 7 ounces of fluids every 15 or 20 minutes to replenish the necessary fluids in the body. There is no optimum temperature of drinking water, but most people tend not to drink warm or very cold fluids as readily as they will cool ones. whatever the temperature of the water, it must be palatable and readily available to the worker. Individual drinking cups should be provided, never use a common drinking cup.

Heat acclimatized workers lose much less salt in their sweat than do workers who are not adjusted to the heat. The average American diet contains sufficient salt for acclimatized workers even when sweat production is high. If, for some reason, salt replacement is required, the best way to compensate for the loss is to add a little extra salt to the food. Salt tablets should not be used. CAUTION: PERSONS WITH HEART PROBLEMS OR THOSE ON A "LOW SODIUM" DIET WHO WORK IN HOT ENVIRONMENTS SHOULD CONSULT A PHYSICIAN ABOUT WHAT TO DO UNDER THESE CONDITIONS.

Protective Clothing

Clothing inhibits the transfer of heat between the body and the surrounding environment. Therefore, in hot jobs where the air temperature is lower than skin temperature, wearing clothing reduces the body's ability to lose heat into the air.

When air temperature is higher than skin temperature, clothing helps to prevent the transfer of heat from the air to the body. The advantage of wearing clothing, however, may be nullified if the clothes interfere with the evaporation of sweat.

In dry climates, adequate evaporation of sweat is seldom a problem. In a dry work environment with very high air temperatures, the wearing of clothing could be an advantage to the worker. The proper type of clothing depends on the specific circumstance. Certain work in hot environments may require insulated gloves, insulated suits, reflective clothing, or infrared reflecting face shields. For extremely hot conditions, thermally-conditioned clothing is available. One such garment carries a self-contained air conditioner in a backpack, while another is connected to a compressed air source which feeds cool air into the jacket or coveralls through a vortex tube. Another type of garment is a plastic jacket which has pockets that can be filled with dry ice or containers of ice.

Recommended Exposure Limits

These Threshold Limit Values (TLVS) refer to heat stress conditions under which it is believed that nearly all workers may be repeatedly exposed without adverse health effects. The TLVs shown in Table I are based on the assumption that nearly all acclimatized, fully clothed workers with adequate water and salt intake should be able to function effectively under the given working conditions without exceeding a deep body temperature of 38 degrees Celsius (100.4 degrees Fahrenheit).

Since measurement of deep body temperature is impractical for monitoring the workers' heat load, the measurement of environmental factors is required which most nearly correlate with deep body temperature and other physiological responses to heat. At the present time, Wet Bulb Globe Temperature Index (WBGT) is the simplest and most suitable technique to measure the environmental factors. WBGT values are calculated by the following equations:

Outdoors with solar load: $WBGT = 0.7\ NWB + 0.2\ GT + 0.1\ DB$

Indoors or Outdoors with no solar load: $WBGT = 0.7\ NWB + 0.3\ GT$

Where: WBGT = Wet Bulb Globe Temperature Index

NWB = Natural Wet Bulb Temperature

DB = Dry Bulb Temperature

GT = Globe Temperature

The determination of WBGT requires the use of a black globe thermometer, a natural (static) wet-bulb thermometer, and a dry bulb thermometer.

Higher heat exposures that shown in Table I are permissible if the workers have been undergoing medical surveillance and it has been established that they are more tolerant at work in heat than the average worker. Workers should not be permitted to continue their work when their deep body temperature exceeds 38.0 degrees Celsius (100.4 degrees Fahrenheit).

Table 1 Permissible Heat Exposure Threshold Limit Values (Values are given in degrees Centigrade WBGT [Fahrenheit])

	Work Load		
Work- Rest Regimen	**Light**	**Moderate**	**Heavy**
Continuous work	30.0 (86.0)	26.7 (80.1)	25.0 (77.0)
75% Work, 25% Rest/Hour	30.6 (87.1)	28.0 (82.4)	25.9 (78.6)
50% Work, 50% Rest/Hour	31.4 (88.5)	29.4 (85.0)	27.9 (82.2)
25% Work, 75% Rest/Hour	32.2 (90.0)	31.1 (88.0)	30.0 (86.0)

References

"Working in Hot Environments," US Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, 1986.

"Threshold Limit Values and Biological Exposure Indices for 1986 - 1987," American Conference of Governmental Industrial, Hygienists, 6500 Glenway Avenue, Building D-7, Cincinnati, OH 45211-4438.

PHYSICAL AGENT DATA SHEET (PADS)

NOISE

Description

Sound is created when a vibrating source (like a bell, motor or a stereo speaker) sends sound waves through the air to your ear. Every sound has two aspects: its pitch (frequency) and its loudness (intensity). On a stereo, frequency is determined by the bass/treble control. Intensity is determined by the volume control. Noise (unwanted sound) is usually made up of many frequencies. The disturbing and harmful effects of noise depend both on the loudness and the frequency of the tones making up noise.

Loudness is measured in units called decibels (dB). A conversational voice is about 65 dB. A shout is 90 dB or greater.

Frequency is measured in units called Hertz (Hz). The frequency of a locomotive horn is about 250 Hz. The frequency of a table saw is about 4,000 Hz.

Health Effects

Excessive noise can destroy the ability to hear, and may also put stress of other parts of the body, including the heart.

For most effects of noise, there is no cure, so that prevention of excessive noise exposure is the only way to avoid health damage.

Hearing

The damage done by noise depends mainly on how loud it is and on the length of exposure. The frequency or pitch can also have some effect, since high-pitched sounds are more damaging than low-pitched sounds.

Noise may tire out the inner ear, causing temporary hearing loss. After a period of time away from the noise hearing may be restored. Some workers who suffer temporary hearing loss may find that by the time their hearing returns to normal, it is time for another work shift so, in that sense, the problem is "permanent."

With continual noise exposure, the ear will lose its ability to recover from temporary hearing loss, and the damage will become permanent. Permanent hearing loss results from the destruction of cells in the inner ear, cells which can never be replaced or repaired. Such damage can be caused by long-term exposure to loud noise or, in some cases" by brief exposures to very loud noises.

Normally, workplace noise first affects the ability to hear high frequency (high-pitched) sounds. This means that even though a person can still hear some noise, speech or other sounds may be unclear or distorted.

Workers suffering from noise-induced hearing loss may also experience continual ringing in their ears, called "tinnitus." At this time, there is no cure for tinnitus, although some doctors are experimenting with treatment.

Other Effects

Although research on the effects of noise is not complete, it appears that noise can cause quickened pulse rate, increased blood pressure and a narrowing of the blood vessels over a long period of time, these may place an added burden on the heart.

Noise may also put stress on other parts of the body by causing the abnormal secretion of hormones and tensing of the muscles.

Workers exposed to noise sometimes complain of nervousness, sleeplessness and fatigue. Excessive noise exposure also can reduce job performance and may cause high rates of absenteeism.

Permissible Exposure Limit

The Action level for noise is an average noise level of 85 dB for an eight-hour day. When employees are exposed to noise levels, which exceed the Permissible Exposure Limit, the employer must install or use engineering or administrative controls to lower the noise levels. While these controls are being designed or installed employees must wear hearing protection. If the controls still do not reduce noise exposures to below 90 dB, hearing protection must continue to be worn.

Protective Measures

Suitable hearing protectors (earplugs or muffs) must be made available at no cost to employees who are exposed to an average of 85 dB or greater for an eight-hour day. Employees must be given the opportunity to select from three different types of appropriate hearing protectors.

Hearing tests (audiometric exams) must be given to employees who are exposed to an average of 85 dB or greater for an eight-hour day. Hearing tests will show whether employees are experiencing any hearing losses. Hearing tests are also useful in showing how well the earplugs and earmuffs are working. Hearing tests must be given annually.

Employees should also receive training in the effects of noise on hearing, an explanation of the hearing tests, and instruction on the proper fitting and care of earplugs or muffs.

Noise away from work can also cause hearing loss. Hearing protectors should be worn when operating noisy equipment or tools such as chain saws, brush cutters, power lawn mowers, or when using firearms.

Refer to Alaska Administrative Code, Occupational Health and Environmental Control 04.0104 for specific regulations on Noise Exposure and Hearing Conservation Programs.

PHYSICAL AGENT DATA SHEET (PADS)

ULTRAVIOLET RADIATION

Description

Ultraviolet (UV) is the name for a band of energy on the electromagnetic spectrum that lies between visible light and x-rays. UV has some of the properties of visible light and other properties of the x-rays. Like visible light, some UV is actually visible but most is invisible like x-rays. UV, like light, cannot penetrate very far into most solids. Some UV, like x-rays, can ionize atoms or molecules which visible light cannot do.

Common sources of UV include the sun (especially when reflected by water, snow or ice), sun tanning lamps, mercury discharge lamps, welding arcs, plasma torches, and some lasers.

Health Hazards

The nature and seriousness of UV injuries depend on the length of exposure, the intensity of the UV, the type or wavelength of UV, the sensitivity of the individual, and the presence of certain chemicals (photosensitizers).

Skin

UV from the sun causes sunburns and skin cancer. UV from other sources can also cause skin burns varying in degree from mild reddening of the skin (first degree burns) to more severe and painful blistering (second degree burns). Long-term skin exposure to UV can cause actinic skin (a dry, brown, inelastic wrinkled skin) and skin cancer. Fair skinned individuals are more likely to develop both sunburns and skin cancer.

Some drugs, such as the antibiotic tetracycline, can cause skin burns from UV to happen faster and to be more severe. Products containing coal tar can also cause this reaction. These substances are called photosensitizers.

UV exposure may trigger cold sores (Herpes Simplex) in some individuals.

Eyes

When UV is absorbed by the eyes and eyelids, it can cause keratoconjunctivitis or "welders' flash." This is a very painful condition that feels like grit in the eyes and may make the eyes water and very sensitive to light. The condition usually occurs 6-12 hours after exposure and may last 6-24 hours. The painful injury may make a person unwilling or unable to open his/her eyes during this time period, but most discomfort is gone within 48 hours with no lasting injury. The maximum sensitivity of the eye occurs at a UV wavelength of 270 manometers. Cataracts or clouding of the lens of the eye can occur during high exposures to wavelengths in the range of 295-300 nanometers.

Skin Safety and Health Precautions

Skin burns from high, short-term exposure to UV and skin cancer from long-term exposure can be prevented by covering exposed skin with clothing and protective equipment such as gloves and face shields. *Barrier creams or lotions with sun protection factors (SPF) of 15-18 will also help prevent skin burns.

*Welders' helmets should provide protection for the neck area as well as the face and eyes.

Eyes

Tinted goggles and/or face shields should be worn to prevent burns of the cornea and eyelids. Selection of the appropriate degree of tint should be based on the anticipated wavelength and intensity of the UV source. (see Table 1)

Table 1

Shade No. 3.0: is for glare of reflected sunlight from snow, water, sand, etc.; stray light from cutting and welding, metal pouring and work around furnaces and foundries; and soldering (for goggles or spectacles with side shields worn under helmets in arc welding operations, particularly gas-shielded arc welding operations).
Shade Nos. 4.0 and 5.0: are for light acetylene cutting and welding; light electric spot welding.
Shade Nos. 6.0 and 7.0: are for gas cutting, medium gas welding, and non-gas-shielded arc welding using current values up to 30 amperes.
Shade Nos. 8.0 and 9.0: are for heavy gas cutting and nongas-shielded arc welding and cutting using current values from 30 to 75 amperes.
Shade Nos. 10.0 and 11.0: are for arc welding and cutting using current values from 75 to 200 amperes.
Shade Nos. 12.0 and 13.0: are for arc welding and cutting using current values from 200 to 400 amperes.
Shade No. 14.0: is for arc welding and cutting using current values over 400 amperes (including carbon arc welding and cutting), and for atomic hydrogen welding.

NOTE: ordinary window glass, 1/811 in thickness, is sufficient protection for the eyes and skin against the ultraviolet radiation from ordinary sources such as sunlight. In cases of extremely intense sources of ultraviolet and visible radiation, it is not adequate.

In sunny conditions on water, snow and ice, extra precautions should be taken to protect against reflected sunlight. Sunglasses with side shields should be worn. When applying

protective ointments or lotions, special attention should be paid to the nose, lips, underside of the chin, and tops of the ears.

In workplaces, operations such as welding which produce high levels of UV should be performed behind enclosures or barriers to absorb the radiation and shield nearby workers.

UV sources like mercury discharge lamps should be operated only with all safety devices in place and in accordance with manufacturer's instructions.

First Aid Procedures

Skin burns: immediate application of cold (cold water, ice, cold clean cloths) to the affected area will reduce the severity and relieve pain associated with first and second degree burns. Do not apply any burn ointments, creams, or butter to skin burns.

Eyes: place sterile dressings over the eyes of a person suffering from UV burns of the eyes and seek medical attention.

Recommended Exposure Limits[2]

The following section is very technical and is included for the use of safety and health professionals who have the skills and equipment to measure UV levels.

These threshold limit values (TLVS) refer to ultraviolet radiation in the spectral region between 200 and 400 nm and represent conditions under which it is believed that nearly all workers may be repeatedly exposed without adverse effect. These values for exposure of the eye or skin apply to ultraviolet radiation from arcs, gas and vapor discharges, flourescent and incandescent sources, and solar radiation, but do not apply to ultraviolet lasers. These values do not apply to ultraviolet radiation exposure of photosensitive individuals or of individuals concomitantly exposed to photosensitizing agents. These values should be used as guides in the control of exposure to continuous sources where the exposure duration shall not be less that 0.1 sec (Figure 1).

These values should be used as guides in the control of exposure to ultraviolet sources and should not be regarded as a fine line between safe and dangerous levels.

Recommended Values

The threshold limit value for occupational exposure to ultraviolet radiation incident upon skin or eye where irradiance values are known and exposure time is controlled are as follows:

1. For the near ultraviolet spectral region (320 to 400 nm), total radiance incident upon the unprotected skin or eye should not exceed 1 mW/cm for periods greated than 110

seconds (approximately 16 minutes) and for exposure times less than 10 seconds should not exceed one J/cm.

2. For the actinic ultraviolet spectral region (200 to 315 nm), radiant exposure incident upon the unprotected skin or eye should not exceed the values given in Table 2 within an 8-hour period.

Table 2 Relative Spectral Effectiveness by Wavelength*

Wavelength (nm)	TLV (mJ/cm^2)	Relative Special Effectiveness S
200	100	0.03
210	40	0.075
220	25	0.12
230	16	0.19
240	10	0.30
250	7	0.43
254	6	0.5
260	4.6	0.65
270	3.0	1.0
280	3.4	0.88
290	4.7	0.64
300	10	0.30
305	50	0.60
310	200	0.015
315	1000	0.003

*See Laser TLVS.

3. To determine the effective irradiance of a broadband source weighted against the peak of the spectral effectiveness curve (270 nm), the following weighting formula should be used:

$$E_{eff} = \Sigma\, E\lambda\, S\lambda\, \Delta\, \lambda$$

where:

E_{eff} = effective irradinace relative to a monochromatic source at 270 nm in W/cm^2 [J/ (s cm^2)]

$E\lambda$ = spectral irradiance in W/(cm nm)

$S\lambda$ = relative spectral effectiveness (unitless)

$\Delta\lambda$ = band width in manometers

4. Permissible exposure time in seconds for exposure to actinic ultraviolet radiation incident upon the unprotected skin or eye may be computed by dividing 0.003 J/cm^2 by E_{eff} in W/cm^2. The exposure time may also be determined using Table 3 which provides exposure times corresponding to effective irradiances in μ W/cm^2.

Table 3 Permissible Ultraviolet Exposures

Duration of Exposure Per Day	Effective Irradiance E_{eff} □(W/cm^2)
8 hrs	0.1
4 hrs	0.2
2 hrs	0.4
1 hr	0.8
30 min	1.7
15 min	3.3
10 min	5.0
5 min	10.0
1 min	50.0
30 sec	100.0
10 sec	300.0
1 sec	3,000.0
0.5 sec	6,000.0
0.1 sec	30,000.0

5. All the preceding TLVs for ultraviolet energy apply to sources which subtend an angle less than 80 degrees. Sources which subtend a greater angle need to be measured only over an angle of 80 degrees.

Conditioned (tanned) individuals can tolerate skin exposure in excess of the TLV without erythemal effects. However, such conditioning may not protect persons against cancer.

Reference

1. Sunlight and Man. Fitzpatrick et all Eds. University of Tokyo Press, Tokyo, Japan (1974).
2. Threshold Limit Values and Biological Exposures Indices for 1986 - 1987. American Conference of Governmental Industrial Hygienists, 6500 Glenway Avenue, Building D-7, Cincinnati, Ohio 45211-4438.

ATTACHMENT 4

Emergency Contact Information

Minor emergency medical care is available from the Tok Medical Clinic, in Tok, Alaska, or from the Tetlin Medical Clinic. Major medical emergency care is available from Providence Medical Center in Anchorage, Alaska. NVT personnel will be referred by the Tetlin Clinic Health Aid to the Chief Andrew Isaac Health Center located in Fairbanks, Alaska.

EMERGENCY SERVICES AND CONTACTS:

Contact information for emergency medical services, police departments, and fire departments, as well as directions to the nearest hospital is provided below.

Organization/Personnel	Phone Number
Ambulance	911
Tok Fire Department	911 / (907) 883-1450
Tok Volunteer Fire Department	(907) 883-5559
Police Department	911
Tetlin Clinic Health Aid (Lydia David)	(907) 324-2151
Hospital – Anchorage (Providence Medical Center)	(907) 562-2211
Poison Control Center	(800) 233-3360
National Response Center	(800) 424-8802
Centers for Disease Control and Prevention	Day (404) 329-3311 Night (404) 329-3644
Tok Medical Clinic 124.5 Tok Cutoff Road Tok, Alaska 99780	(907) 883-5855
Chief Andrew Isaac Health Center 1408 19th Avenue Fairbanks, Alaska 99701	(907) 451-6682 (800) 478-6682

OTHER EMERGENCY CONTACTS:

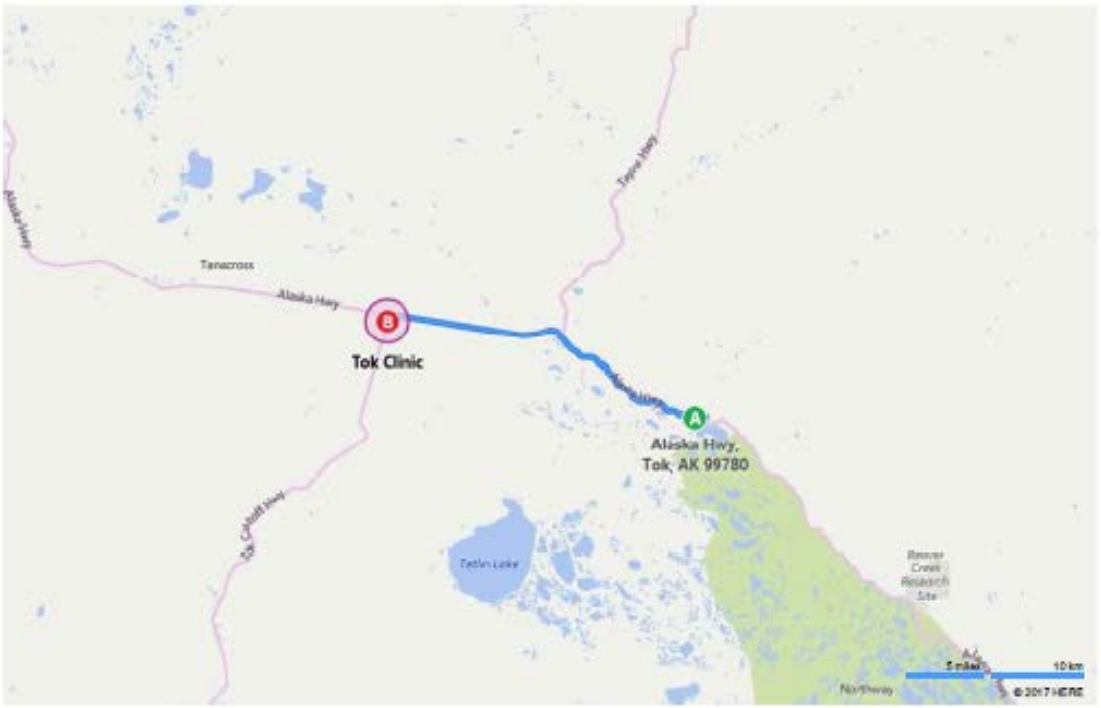
Bristol Project Manager (Tyler Ellingboe)	(907) 563-0013 / (907) 230-2757
TVC NALEMP Coordinator (Patricia Young)	(907) 883-2021 / (907) 940-0077
Bristol Site Superintendent - TBD	(907) 563-0013
Bristol SSHO - TBD	(907) 563-0013
Bristol Anchorage Office	(907) 563-0013

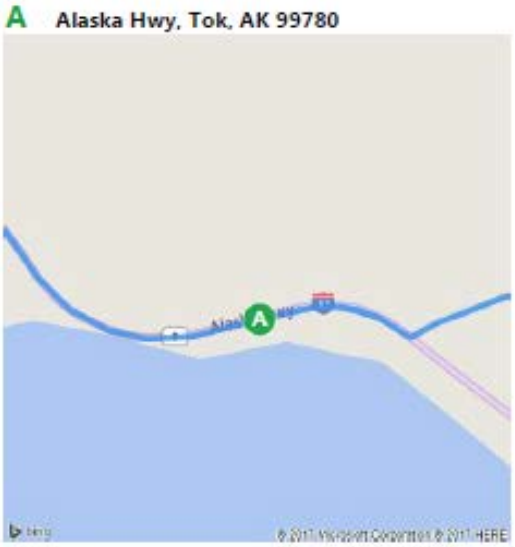
Notes:

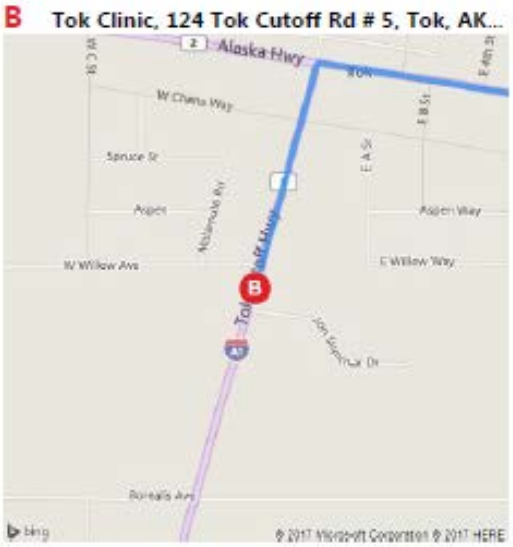
NALEMP = Native American Lands Environmental Mitigation Program

TVC = Tetlin Village Council

SSHO = Site Safety and Health Officer







From the Midway Lake turnout head west onto I-A1 / AK-2 / Alaska Highway for 24.3 miles

Turn left to stay on I-A1 / AK-1 /Tok Cutoff Highway for 0.5 miles

Arrive at I-A1 / AK-1 / Tok Cutoff Highway (The last intersection is W Willow Ave. If you reach Jon Summar Dr, you've gone too far)

Tok Clinic 124 Cutoff Road #5, Tok, AK

907-883-5855

ATTACHMENT 5

Incident Report Form

Bristol Incident Report Form

Report date: _____

Type of Incident	Description
☐ Injury or Illness	Includes cases of First Aid or greater
☐ Motor vehicle	Was anyone injured? (Y/N) (If yes fill out Injury/Illness section below)
☐ Fire	Any fire, including incipient stage, must be reported
☐ Property Damage	Was there more than $2,000 in property damage (Y/N)
☐ Spill	Any spill of liquid (e.g., fuel, hydraulic fluid) to the ground surface or water that exceeds SWPPP, EPP or contract requirements
☐ Near Miss	An event where an incident could have occurred. *Report any near miss incident as per the potential for damage/injury*

Reporting Log (include date and time)

Notification to	Date & Time
Supervisor	
SSHO (if project incident) or NA	
Axiom (injury only)	
Company manager	
Corporate Health & Safety	
Client (if applicable) or NA	

Only members of Bristol's Corporate Health and Safety Department shall notify external regulatory authorities.

General Information

Company: _____ Job number (if applicable): _____

Supervisor or Site Superintendent Name: _____

Date of Incident: _____ Time of Incident: _____ Person Completing Worksheet: _____

Location Information

Exact Location of Incident: _____ Project/Facility Name: _____

State: _____ City: _____

Person Involved *If injury/illness incident employee who was injured or ill. If Motor Vehicle, Fire, Property Damage or Spill incident employee who caused or was involved in incident*

Does this person have an injury/illness? (Y/N) (If yes fill in additional information in Injury/Illness section below

Last Name: _____

First Name: _____

Middle Initial: ___ Age: _____ Gender: _____

Time Started Work: _____ Job Title: _____

Date Hired: _____ Employer: _____

Incident Information

Pre-incident activity:

Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. Examples: "climbing a ladder while carrying roofing materials", "spraying chlorine from hand sprayer", "daily computer key-entry."

Incident events:

Examples: "When ladder slipped on wet floor, worker fell 20 feet", "Worker was sprayed with chlorine when gasket broke during replacement", "Worker developed soreness in wrist over time."

Witnesses *include names of witnesses (Name/Phone #)*

Complete for Injury and Illness Incidents

Additional Information from Injured/Ill Person

Date of Birth

Street Address

City State Zip

Physical Description of Injury or Illness

Type of injury Body part

Extent of injury (from where to where

Additional information

Physical mechanics of injury Examples*: "concrete floor", "chlorine", "radial arm saw." If this question does not apply to the incident, leave it blank*.

Physician or Health Care Professional Information

Name of physician or health care professional

Name of facility of treatment

Facility street address

City State Zip

Was employee treated in an emergency room? (Y/N)

Was employee hospitalized overnight as an in-patient? (Y/N)

Please attach a release form for return to work if applicable

Physician's comments or notes

Did employee refuse medical attention beyond first aid? (Y/N) If Yes, explain

Signatures

Name (person completing report) Title

Signature (person completing report) Date

Name (employee)

Signature (employee) Date

Submit completed form to ***#Incident Reporting and Investigation***

APPENDIX C

Key Personnel Resumes

ERIC BARNHILL

Environmental Scientist

Years of Experience

Total: 17 Bristol: 11

Areas of Expertise

Biology

Fisheries Research

Research Development

Remedial Investigation Sampling

Groundwater Sampling

Training and Certifications

OSHA 30-hour Construction Safety and Health

40-hour HAZWOPER Training

C4 HAZWOPER Supervisor

Hazardous Materials Transportation DOT/IATA

AK Certified Erosion and Sediment Control Lead

Wetland Training Institute Wetland Delineation Certification Program

CPR and First Aid for Adults

Defensive Driving Training

Boating Safety

Education

B.S., Biology, Eastern Washington University, 1999

Mr. Barnhill has used his environmental science capabilities at contaminated site projects since 2007. Complementing his responsibilities as an environmental scientist/environmental sampler for site assessments and groundwater monitoring investigations, Mr. Barnhill has served as Site Safety and Health Officer (SSHO) on multiple projects and was recognized by the US Army Corps of Engineers (USACE) with an individual safety award in 2012. Mr. Barnhill has an extensive background in fisheries science, including research and development of numerous fisheries projects. Additionally, he has been responsible for developing contracts and research plans for fisheries research.

As an environmental scientist for Bristol, Mr. Barnhill is responsible for preparing planning documents and reports; preparing for field sampling activities, coordinating field logistics; performing investigations/assessments, site characterizations, and remediation work; documenting all field activities; assisting the Project Manager in obtaining subcontractors; and providing subcontractor oversight.

Project Experience

- **Contractor Quality Control Systems Manager/Certified Erosion and Sediment Control Lead/SSHO, Source and Incidental Contaminant Removal Action, USACE, Alaska District, Attu Island, Alaska (07/2016 – 08/2016; $7.9M).** Implemented the three-phase quality control system, performed quality control inspections of the various concurrent phases of work being performed, prepared daily quality control reports (DQCRs), recorded all safety and health information on a daily basis, and coordinated with the onsite USACE team to ensure that work proceeded in an expeditious and safe manner. The scope of work included removal of identified hazards including tar/petroleum, oil, and lubricants (POL)-contaminated soil, leaking aboveground storage tanks (ASTs), and lead-contaminated soil associated with lead acid batteries.

- **Environmental Scientist, Elmendorf De-Icer Tank Field Screening, Joint Base Elmendorf-Richardson Air Force Base (JBER), Anchorage, Alaska (04/2016 – 06/2016; $5K).** Scope of work included field screening of soil associated with the construction of an AST. Performed field-screening on soil collected from the site to help determine the presence or absence of contamination in the proposed location of the AST and associated distribution piping.
- **Environmental Scientist, Geotechnical Site Investigations and Environmental Site Assessment, Alaska Native Tribal Health Care Facilities, Anchorage, Alaska (01/2016 – 03/2016; $39K).** Performed field-screening on soil collected from borings at the health care campus for proposed multi-story healthcare facility. Sampling was performed in conjunction with Golder and Associates and Discovery Drilling. Several of the boreholes were turned into monitoring wells.
- **Environmental Scientist, Schnitzer Steel Industries Site Investigations, Schnitzer Steel, Anchorage, Alaska (12/2015 – 05/2016; $89K).** Scope of work included the evaluation of surface water, subsurface soil, and groundwater at the site to assess potential impacts resulting from historic site activities. Collected samples from onsite monitoring wells and surface water feature.
- **Environmental Scientist, Leaking Underground Storage Tank (LUST) Site Assessments in Indian Country, Davis Chevrolet/NAV 185, U.S. Environmental Protection Agency (EPA), Tuba City, Arizona (12/2015; $582K).** Installed and collected soil gas samples from 14 temporary soil gas probes. Performed monitoring of underground product recovery system.
- **Environmental Scientist, Underground Storage Tanks (USTs) 415 and 416 Closure in Place and Site Characterization, USACE, Alaska District, Fort Greely, Alaska (10/2015).** The purpose of this project was the in-place closure of USTs 415 and 416 and site characterization to determine if any releases associated with these USTs occurred.
- **Environmental Scientist, Longhorn Service and Potter Family Trust LUST Sites, Uintah and Ouray Indian Reservation, EPA, Duchesne, Utah (10/2015 – 11/2015; $120K).** Onsite supervision of a team of subcontractors during the injections of an in-situ chemical oxidation product called PersulfOx.
- Contractor Quality Control System Manager (CQCSM)**/Site Superintendent/SSHO, Northeast Cape Annual Groundwater Monitoring/Landfill Visual Inspection, USACE, Alaska District, St. Lawrence Island, Alaska (08/2015; $197.4K).** Created site safety documents in conjunction with the Bristol Health and Safety Director, created and presented daily health and safety talks, and oversaw the health and safety inspections of facilities and equipment. As Site Superintendent, coordinated travel, equipment, materials, personnel and supplies. Sampling responsibilities included surface and groundwater sampling. Performed a visual inspection of the site's two capped landfills. The project consisted of groundwater sampling of the site's monitoring wells and surface and limited surface water sampling in conjunction with landfill monitoring.

- **Environmental Scientist/CQCSM, Environmental Investigations at Haines Fuel Terminal (HFT), Sears Creek Station (SCS), Tok Fuel Terminal (TFT), USACE Alaska District, Haines, Alaska (07/2015 – 09/2015; $12.2 M).** Responsible for soil sampling to determine the extent of contaminated soil. Collected more than 250 field screening samples for PID head space analysis. Collected 60 soil samples for definitive analysis defining contaminated soil boundaries. Ensured that soil screening and sampling was performed in a manner consistent with ADEC field sampling guidance. Served dual responsibilities as CQCSM for environmental investigation and removal actions at the Sears Creek Pump Station and Tok Fuel Terminal. As CQCSM, responsibilities included implementing the three-phase quality control system, performing quality control inspections of the various concurrent phases of work that were being performed, and preparation of DQCRs. The project consisted of three separate RIs and four Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) non-time critical removal actions, Class V Underground Injection Control (UIC) closures, and contaminated soil removal.
- **Environmental Scientist, Crowley 2015 Hydro Test, Crowley, Valdez, Alaska (06/2015; $35K).** Assisted main inspector with hydrostatic testing of Crowley's north dock and south dock fueling stations.
- **Site Superintendent/CQCSM/SSHO, USACE, Omaha District, Fort McPherson, Atlanta, Georgia (05/2015 – 07/2015; $387K).** Oversaw the daily operations of the project. Served as CQCSM and SSHO to ensure proper site implementation of the three-phase inspection process, recorded all safety and health documentation on a daily basis, and produced DQCRs. Documented the daily progress of mold removal, asbestos surveying and assessment activities at historical Fort McPherson in Atlanta, Georgia. Served as the CQCSM, working closely with the site superintendent to ensure that the asbestos survey/assessment of approximately 150 buildings and mold removal in six buildings was performed in compliance with contract documents. The work was performed as a time-critical immediate response for the Omaha Corps of Engineers.
- **SSHO/Environmental Sampler/Certified Erosion and Sediment Control Lead, Northeast Cape Hazardous, Toxic, and Radioactive Waste (HTRW), USACE, Alaska District, St. Lawrence Island, Alaska (07/2014 – 11/2014; $6.5 M).** Created site safety documents in conjunction with the Bristol Health and Safety Director, created and presented daily health and safety talks, and oversaw the health and safety inspections of facilities and equipment. Sampling responsibilities included coordinating sampling efforts for several sites within the project area, soil sampling, water sampling, tar sampling, and packing/shipping of samples. The project consisted of removal and containerization of arsenic-, POL- and Polychlorinated Biphenyls (PCB)-contaminated soil and contaminated sediment, and debris removal.
- **Environmental Scientist, Rocky Point Pipeline and Transformer Containerized Hazardous, Toxic, and Radioactive Waste (CON/HTRW) Removal Action, Amaknak Island, Unalaska, Alaska (04/2014; $1.8M).** Assisted in the preparation of site safety and health documents. Project known hazards included POL fuels, PCBs, and asbestos-containing materials.
- **SSHO/Environmental Sampler/Certified Erosion and Sediment Control Lead, Northeast Cape HTRW, USACE, Alaska District, St. Lawrence Island, Alaska (07/2013 – 10/2013;**

$13.4M). Created site safety documents in conjunction with the Bristol Health and Safety Director, created and presented daily health and safety talks, and oversaw the health and safety inspections of facilities and equipment. Sampling responsibilities included coordinating sampling efforts for several sites within the project area, soil sampling, water sampling and tar sampling and packing/shipping of sampling. The project consisted of removal and containerization of arsenic-, POL- and PCB-contaminated soil and contaminated-sediment, and debris removal.

- **SSHO, Native American Lands Environmental Mitigation Program (NALEMP) Site Investigation, and Removal Action, Native Village of Savoonga (NVS), Native Village of Northeast Cape, St. Lawrence Island, Alaska (07/2013 – 09/2013; $557K).** Assisted with the preparation of health and safety documents. Site work included heavy equipment use, digging by hand, onsite combustion of non-hazardous building debris, and the collection and subsequent offsite shipment of lead-based paint-containing construction debris and asbestos-containing material.
- **SSHO/Environmental Scientist/Environmental Sampler, Ramah Ranch RI and Interim Removal Action (IRA), USACE, Albuquerque District, New Mexico (04/2012; $985K).** Created site safety documents in conjunction with the Bristol Health and Safety Director, and created and presented daily health and safety talks. Worked on the Ramah Ranch project that included a site characterization/RI and an IRA at a rocket propellant impact site in New Mexico. Sampling responsibilities included creating and implementing a Multi Increment® (MI) sampling design and sample management. Other duties included coordination with federal and state entities on an endangered and threatened species survey. The survey was both academic and part of a three-person crew that performed a walking/driving survey of the site.
- **Environmental Scientist, Groundwater and Landfill Gas Monitoring, Fort Richardson Landfill, JBER, Alaska (01/2012 – 09/2012; $920K).** Sampling included quarterly groundwater for selected wells, annual groundwater detection monitoring, quarterly landfill gas monitoring for selected gas probes, and semiannual gas monitoring.
- **Environmental Scientist/Lead Environmental Sampler, Northeast Cape HTRW, USACE, Alaska District, St. Lawrence Island, Alaska (07/2011 – 10/2011; $18.4M).** Sampling responsibilities included coordinating sampling efforts for several sites within the project area, soil sampling, water sampling, tar sampling, and packing/shipping of sampling. The project consisted of removal and containerization of POL- and PCB-contaminated soil and removal of tar and tar-contaminated soil.
- **Environmental Scientist, Choggiung Limited Spill, Choggiung Limited, Dillingham, Alaska (10/2010; $3.7K).** Sampling responsibilities included excavating soil from beneath an AST with a fuel leak and taking several samples from the excavation to determine possible closure. The project consisted of direction of soil excavation and collection of analytical samples.
- **Environmental Scientist, Northeast Cape HTRW, USACE, Alaska District, St. Lawrence Island, Alaska (07/2010 – 09/2010; $7.5M).** Sampling responsibilities included coordinating sampling efforts for several sites within the project area, soil sampling, water sampling, and packing/shipping of samples. The project consisted of a landfill cap and removal of POL- and PCB-contaminated soil.

- **Technical Lead, Site Inspections and Removal Response Actions at Former Army Air Field, Fort Sumner, New Mexico (02/2010; $2M).** Responsibilities included functioning as liaison between Bristol and the subcontractor performing sampling duties, MI Sampling, tank removal, soil sampling beneath tanks, and assisting CQCSM with daily paperwork duties.
- **Environmental Scientist, Soil Sampling, Federal Aviation Administration (FAA), Selawik, Alaska (09/200; $9).** Responsibilities included taking samples in frozen soil, packing and shipping of samples, and swing tying. The project consisted of collecting confirmation samples of soil from beneath an AST where an overfill of two gallons of diesel fuel occurred years earlier.
- **Lead Environmental Sampler, Northeast Cape In-Situ Chemical Oxidation (ISCO) Study and Intrusive Drum Removal/Landfill Cap, USACE, Alaska District, St. Lawrence Island, Alaska (07/2009 – 09/2009; $7.8M).** Sampling responsibilities included coordinating sampling efforts for several sites within the project area, soil sampling, water sampling, POL sampling and packing/shipping of samples. Tasks included report writing and gathering field supplies. This project included the excavation of an historic landfill with removal of drums of oil, transformers and other contaminated items, and an in-situ study to determine if chemical oxidation was a viable method for remediation of a petroleum-contaminated area.
- **Environmental Scientist, Well Inventory Project, Fort Richardson, Alaska (05/2009 – 09/2009; $920K).** Responsibilities included researching information on well locations; physically finding wells using a Trimble Global Positioning System (GPS) unit; and taking well field parameters, including well casing size, depth of well, depth to water, and obtaining GPS positions for inclusion in a geographic information system (GIS) database. The project consisted of a team of environmental scientists locating wells on the Fort Richardson Post, and noting metrics such as well damage, water level, casing type, etc., for inclusion in a military wells database.
- **Field Environmental Scientist, Data Collection Project, Fairbanks Environmental Services, Fort Wainwright Operating Unit 3, Alaska (04/2009).** Responsibilities included collecting well information and taking groundwater parameters for diesel range organics (DRO), gasoline range organics (GRO), volatile organic compound (VOC), 1,2-dibromoethane (EDB), polynuclear aromatic hydrocarbon (PAH), iron (II), lead, and sulfate analysis using low-flow groundwater sampling techniques.
- **Environmental Scientist, Former Skelly Site Assessment, EPA 1004, Winnebago, Nebraska (10/2008; $120K).** Tasks included preparing the Site Health and Safety Plan, installing soil borings, monitoring wells, and collecting soil and groundwater samples. The project consisted of conducting a site assessment at a potential LUST site on the Winnebago Reservation in Nebraska, following Nebraska Department of Environmental Quality (NDEQ) guidelines for a Tier 1 Site Assessment.
- **Environmental Scientist, Choggiung East Creek Hatchery Post Treatment Sampling and Assessment Report, Choggiung Limited, Dillingham, Alaska (10/2008).** Duties included developing sampling grid, soil sampling, collecting field-screening headspace samples, using a photoionization detector (PID), and packing and shipping of samples. Prepared a report summarizing field activities, presenting analytical data, and providing

recommendations for future site remediation. Project consisted of soil sampling for assessment of a land farm being used to remediate petroleum-contaminated soil.

- **Environmental Scientist, Private Residence Heating Fuel Investigation, Dillingham, Alaska (10/2008; $5K).** Developed a sampling protocol and performed soil sampling of an excavation at a private residence. Duties included developing sampling grid, soil sampling, and packing and shipping of samples.
- **Environmental Scientist, Project Support for Elmendorf Treatability Study, Parsons Infrastructure & Technology Group Inc., JBER, Alaska (06/2008).** Provided assistance for installation of bladder pump and set up of micro purge system for groundwater sampling from monitoring wells. Calibrated YSI-brand water quality meter and logging system for groundwater monitoring. Performed seep sampling using a peristaltic pump. Assisted in labeling, packing, and shipping of samples.
- **Environmental Scientist, Wetland Delineation, Alaska Natural Gas Development Authority (ANGDA), Various Locations, Alaska (06/2008 – 09/2008).** Performed wetland delineation on sections of an approximately 470-mile proposed natural gas pipeline corridor. The effort was initiated by ANGDA to prepare primary requirements for a USACE National Environmental Policy Act (NEPA) ecological evaluation. Duties included traversing developed and undeveloped Alaska wilderness; navigation and data entry using ArcPad software on several models of Trimble GPS units; determining whether areas along the route were wetlands or uplands; and participating in all aspects of wetland delineation including digging pits, identifying soil types using Munsell soil charts, and identifying local plant types. Training included wildlife health and safety; wildlife interaction; rare plant identification; wetland procedures; and using GIS to prepare a Wetland Delineation Report, which included Wetland and Waterways Report, Preliminary Project Description, Support Data (Field forms, JD Forms, Photographs) and Mapping.
- **Environmental Scientist, Cape Yakataga Landfill Removal Project, Phase III, FAA, Cape Yakataga, Alaska (04/2008 – 06/2008; $14.7M).** Collected waste characterization and confirmation soil samples for the decommissioning of a landfill and biocell. Prepared waste manifests for barge shipments of contaminated soil to a disposal facility.
- **Environmental Scientist, Annette Island Phase I Environmental Due Diligence Audit (EDDA), FAA, Annette Island, Alaska (04/2008).** Project responsibilities included conducting site visits to check for environmental contamination, interviews, database searches, and preparation of report and figures. Project consisted of site assessment of a former FAA site.
- **Environmental Scientist, Private Housing Development Project, Totem Trailer Park, Anchorage, Alaska (04/2008).** Performed onsite assistance for well placement for groundwater contamination study. Project consisted of well installation in a residential mobile home park to assess soil and groundwater contamination.
- **Environmental Scientist, Beaufort Sea Project, USACE, Alaska District, North Slope, Alaska (09/2007).** Performed remedial investigation sampling at Kogru, Collinson Point, and Nuvagapak Distant Early Warning (DEW) Line sites. Assisted with developing the work plan; sampled soil, sediment and surface water; and packaged and shipped samples. Project consisted of soil sampling of former DEW line sites.

Professional Experience

- **Staff Biologist, Bering Sea Fishermen's Association, Anchorage, Alaska (2003 – 03/2007).** Developed fisheries research project in rural western Alaska and interior Alaska. Aided in the facilitation of these fisheries projects, and provided onsite guidance and hands-on research. Developed and maintained strong relationships with State of Alaska fish and game entities. Developed contracts and research plans for fisheries research. Conducted data collection and storage. Acted as support staff of the Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative. Planned data sharing symposiums and meetings. Provided oversight for many aspects of several fisheries projects. Maintained frequent contact with state, federal, and non-governmental employees for field projects. Performed grant writing and contract development. Responsible for maintaining ongoing compliance with grant criteria. Participated in watershed council meetings, resource advisory committees, Alaska Board of Fisheries Meetings, North Pacific Fisheries Management Council meetings, and various other fisheries-related meetings. Assisted Executive Director and Program Director with fisheries issues as they arose. Performed operations in remote areas, including field camp setup and maintenance, weir installation, and project preparation, setup, and maintenance. Traveled extensively to projects across the state of Alaska.
- **Fisheries Technician II, Alaska Department of Fish and Game (2001 – 2003).** Worked on the Yukon River, Kuskokwim River, and several other Western Alaska and Interior Alaska rivers, as well as Bristol Bay. Traveled to and lived in remote areas and performed camp setup. Performed radio tagging of salmonids. Used gill netting as a capture method. Performed scale taking, scale reading, tissue sampling, and otolith extraction on herring. Performed Age-Sex-Length (ASL) sampling. Performed river navigation and utilized Global Positioning System. Maintained fish wheels as a means of data collection and used data loggers. Identified salmon and resident species.
- **Laboratory Aide, Eastern Washington University, Cheney, Washington (1998 – 1999).** Collected walleye Above Sea Level (ASL) information and read walleye scales. Assisted in separating out juvenile preserved fish by species. Performed backpack and boat electrofishing and collected samples from an electrofishing boat. Assisted in collecting individual and population statistics.

Awards

2012 Individual Safety Award from the USACE for work as an Alternate Health and Safety Officer at NE Cape.

SHANE BURGESS

Project Manager/Quality Control Manager

Years of Experience

Total: 29; Bristol: 11

Areas of Expertise

Job Site Supervision of Personnel and Sub-Contractors

Quality Assurance/ Site Safety

Project Point of Contact between State and Federal Agencies

Regulatory Compliance

Heavy Equipment Operation

Training and Certifications

USACE CQM for Contractors

AK-CESCL Storm Water Training

OSHA 30-hour

Confined Space Entry

HAZMAT Transportation (DOT/IATA)

EPA/AHERA-Asbestos Abatement Supervisor/Contractor

Alaska UST/AST, Retrofit and Decommission License #8, #597

HAZWOPER 40-hour and 8-hour refresher

HAZWOPER Supervisor

First Aid/CPR

Bear Guard

Registration

Alaska UST/AST, Retrofit and Decommission License #8, / #597

Alaska CDL License, 1991, AK 6327366

Education

BA, Construction Project Management, George Washington University, 2009.

Texas Tech University, 1988

Mr. Burgess began working in the construction and environmental industries in 1988. He is formally trained in all major areas of Hazardous Waste Operations and Site Health and Safety. He has extensive environmental operational experience, focusing on results-oriented site health and safety program implementation, hazardous waste management, drum sampling, confined space entry operations, and above ground storage tank (AST) and underground storage tank (UST) regulated closures and removals and retrofits. He has extensive experience with heavy equipment operation and supervising hands on field and construction work, including four years' experience as Construction Manager for commercial and residential vertical construction. Mr. Burgess' work experience includes scheduling, coordinating, contracting, budgeting, and client interaction.

Project Experience

- **Project Manager/Site Superintendent/Contractor Quality Control Systems Manager (CQCSM), FFP Contract, AFCEE/US Army Corps of Engineers (USACE), Alaska District, Point Lay, Alaska (05/2012 – Present; $6.5M).** Responsible for contract execution, subcontracts, budgets, scheduling, cost tracking, monthly progress reports, oversight of field crews, daily reporting, and coordination with state and federal wildlife entities in regard to the federally protected Pacific walrus and Polar Bear interaction/avoidance. The project included the removal of 13,113 tons of petroleum, oil, and lubricants/polychlorinated biphenyl (POL/PCB) contaminated soils. The soil was placed in 1,272 eight cubic yard Super Sacks for transport and staged for removal. A two mile ice road was constructed to transport the Super Sacks to the outer Barrier Island where they were picked up the following summer by barge and transported to a disposal facility in Washington.

- **Project Manager, Rapid Response Hazardous, Toxic, and Radioactive Waste (HTRW) Indefinite Delivery/Indefinite Quantity (IDIQ) Contract, USACE Omaha, Nebraska - Washington, Texas, Oklahoma, Massachusetts. (09/2010 – 12/2012; $2.5M).** Responsible for contract execution, subcontractor, budgets, cost tracking, invoicing, and weekly progress reports. Assigned and managed subcontractors to perform site assessments, install ground borings and groundwater monitoring wells, collecting analytical samples, the installation of remediation systems. The projects included repair, replacement, or testing of fuel hydrant lines and tanks.
- **Project Manager, Subcontract to URS Corporation, LLC. Formerly Used Defense Site (FUDS), RI/FS, Fort Glenn, Alaska (06/2010 – 12/2012, $2.7M).** Responsible for contract execution, budget, cost tracking, invoicing, weekly reporting. Provided barging logistics, air medivac support, and camp support to the remote island of Umnak, Alaska for the Release Investigation/Feasibility Study (RI/FS) of chemical weapons from WWII.
- **Project Manager, HTRW Rapid Response HTRW IDIQ Contract, USACE Omaha, Nebraska. FEMA Emergency Broadcasting Transmitter, Pasadena, California. (02/2010 – 03/2013; $750K).** Responsible for contract execution, subcontractors, budgets, cost tracking, scheduling, and weekly progress reports. The project consisted of the removal of a regulated UST for backup power generation along with all associated fuel lines and day tank; installation of a new fiberglass reinforced plastic (FRP) UST, secondary contained buried fuel lines, and day tank and line/tank leak detection-monitoring equipment.

Professional Experience

- **Construction Manager/QC Manager, CCI, Inc. Umn Qasr Iraq (02/2009 – 10/2010; $55M).** Coordination and oversight for the construction of a 300,000 centimeter earthen filled open cell pier and a 200 meter floating pier along with associated infrastructure utilities, potable water, fuel and electrical distribution.
- **Project Manager/QC Manager, CCI, Inc. Anchorage, Alaska, (2005 – 2010; $7M).** AEA-Alaska Energy Authority: Bulk Fuel Upgrades in Aniak, Takotna, Sterling Landing, Stony River, Sleetmute, Chuathbaluk, Crooked Creek, and Red Devil (05/2007 – 11/2008). The projects took place along the Middle Kuskokwim River in Interior Alaska and involved the installation of new tank farms, piping to various utilities, dirt work, and the cleaning and decommission of the old fuel tank farms, placement of new generator modules, fuel piping from the tank farms to the modules and electrical tie-in to the village power grid.
- **Construction Manager/QCM Manager, NANA Pacific, Basrah, Iraq (10/2004 – 12/2005; $11M).** Managed construction on an IDIQ contract to reconstruct the Basra International Airport in Southern Iraq. Work involved refurbishing the terminal, air traffic tower, air conditioning mega chillers, terminal power grid, water lines, sewer lines, and road repairs. Labor work force consisted entirely of Iraqi nationals.
- **Operations Director/Construction Manager/QC Manager, Statewide Petroleum, Anchorage, Alaska (2004 – 2005; $4.5M).** White Alice-DEW Line facility demolition in Hoonah, Alaska. The USACE project consisted of abating lead paints and asbestos-containing materials. Demolition of one 38,000-square-foot concrete building, two Quonset

huts, and three 90-foot by 90-foot by 100-foot radio towers. Environmental cleanup of approximately 1,000 cubic yards of diesel/gas-contaminated soils and PCB-contaminated soils.

- **Construction Manager, Alaska Showcase Homes, Anchorage, Alaska (2001 – 2004; $15M).** Project Manager for the construction of high-end custom homes and commercial multi-family dwellings.
- **Construction Manager, Statewide Petroleum Service, Anchorage, Alaska (1991 – 2001; $15.5M).** Project Manager and Site Superintendent for a USACE - FAA housing and bulk fuel farm construction project at Sisters Island, Alaska.

TYLER ELLINGBOE

Project Manager/Senior Waste Specialist

Years of Experience

Total: 21; Bristol: 8

Areas of Expertise

Project Management

Hazardous/Non-Hazardous Waste Materials Management

Regulatory Compliance

Logistics

Sampling

Training and Certifications

40-hour Hazardous Waste Operation & Emergency Response (HAZWOPER)

HAZWOPER Site Worker and Supervisor Training

RCRA Hazardous Waste Regulations/Land Disposal Restrictions

Hazardous Materials Transportation (49CFR 172.700-704) / IATA and Refresher

HAZCAT Chemical Identification System Training

Physical Sampling for Hazardous Materials and Contaminants Training

Toxic Substances Control Act Training (TSCA)

Laser Induced Fluorescence (LIF) Data Interpretation Training

Lead-Based Paint Renovator

Education

M.S., Engineering and Science Management – Science Option, University of Alaska Anchorage, Alaska, 2007

B.S., Biological Sciences-Fish and Wildlife Management Option, Montana State University, Bozeman, Montana, 1994

Since 1995, Mr. Ellingboe has used his education and specialized training to advance his skills in project management, chemical identification and characterization, and logistics. His project management experience ranges from small privately-owned businesses to larger corporations and from municipal and borough household waste programs to federal projects and contracts. Mr. Ellingboe has extensive experience executing remedial investigations and removal actions. His knowledge of the Washington Administrative Code (WAC); Occupational Safety & Health Administration (OSHA); Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); U.S. Department of Transportation (DOT); International Air Transport Association (IATA); and Toxic Substances Control Act (TSCA) regulations are crucial to completing work on time while maintaining regulatory compliance. Mr. Ellingboe is a State of Alaska Qualified Sampler, and has extensive experience in sampling, identification, consolidation, labeling, lab-packing, packaging, profiling, manifesting, and transporting of hazardous/ nonhazardous waste materials. His primary responsibilities also include the supervision and direction of project staff, and managing the schedules of personnel and equipment. His experience also includes regulatory and contract compliance accountability, waste tracking, and reporting requirements. His various projects have led to a wide range of experiences in both local and remote arctic areas and conditions.

As Project Manager for Bristol, Mr. Ellingboe is responsible for all aspects of project management including developing and monitoring project schedules and budgets, appraising client technical and contract officers of project progress through progress reports and other correspondence, coordinating project activities to ensure the completion of all project tasks and milestones, and coordinating research activities to ensure consistency of report information and presentation.

Project Experience

- **Project Manager, Source and Contaminated Soil Removal (Scottie Creek Scraper Trap, Birch Lake Tank Storage, Timber Pump Station), FUDS (FUDS No. F10AK1016-13/-12/-11), USACE, Alaska District, Vicinity of Salcha, Delta Junction, and Alaska/Canada Border, Alaska (07/2016 – Present; $2.2M).** Primary responsibility included overall project management, including project status reporting, budgeting, invoicing, and management of subcontractors. Primary author of planning documents. General objectives of project is to complete public involvement requirements concerning the scoped field effort and to properly remove, transport, and dispose of fuel-contaminated soil from three sites along the Haines-Fairbanks Pipeline corridor and complete site restoration activities. Additional scoped field work included the removal, transport, and disposal of ASTs, USTs, decommissioning of drinking water and groundwater monitoring wells, and the removal of the pipeline distribution system (pipeline, valving, and concrete valve manifold pits). Project also included a Class V Underground Injection Control (UIC) well closure of the septic system and dry well and the removal of all potential point sources. The planned Class V UIC well closure included an abatement of asbestos-containing material (ACM) component.
- **Project Manager, Contaminated Soil Removal (Gate Valve No. 49) and Groundwater Monitoring Well Decommissioning (Pipeline Milepost 19.5, Gate Valve No. 59, and Gate Valve No. 69), (FUDS No. F10AK1016-03/-09/-10/-16), USACE Alaska District, Vicinity of Haines, Tok, and Salcha, Alaska (04/2015 – 04/2016; $881K).** Primary responsibilities included overall project management including QA/QC of all project deliverables. Key duties included management and control of project performance including cost-tracking, monthly status reporting, pay estimate submittal, and management of subcontractor services. The project involved a POL-contaminated soil removal action located along the former Haines-Fairbanks Pipeline as well as decommissioning groundwater monitoring wells at three sites located along the former pipeline corridor. Project was logistically challenging due to semi-remote locations along Alaska Highway road corridors.
- **Project Manager, Amaknak Rocky Point Pipeline and Transformer CON/HTRW Removal, FUDS (FUDS No. F10AK0841-11), USACE Alaska District, Amaknak Island, Alaska (12/2014 – 04/2016; $1.76M).** Primary responsibilities included coordinating subcontractors and actively communicating with all stakeholders during the removal effort. Responsible for overall management of the contract including monthly status reporting, invoicing, schedule updates, and budgeting. Directly responsible for the proper management of all waste materials generated, packaged, and transported to permitted treatment, storage, and disposal facilities (TSDFs). Supervised and managed the preparation and production of the draft and final removal action (RA) reports. The primary objective of the Rocky Point project was to remove and dispose of seven FUDS-eligible sections of petroleum, oil, and lubricant (POL) pipelines and their contents, as well as identifying, removing, and disposing associated valves/transformers, electrical equipment, vaults and their contents, and petroleum-contaminated soil and water. The project team performed field work in a remote Alaska environment with adverse weather conditions.

- **Project Manager, Sanak Island Formerly Used Defense Site (FUDS) (FUDS Nos. F10AK020401 and F10AK020402), US Army Corps of Engineers (USACE), Alaska District, Sanak Island, Alaska (01/2014 – Present; $4.7M).** Responsibilities included overall management of the contract, including budget tracking and the preparation and submittal of invoices, monthly status reports, updated project schedules, exposure hour reporting, quality assurance, and quality control of the deliverables, and management of subcontractors. The project included hazardous, toxic, and radioactive waste (HTRW) Remedial Investigation (RI) with limited Containerized (CON)-HTRW removal at a remote FUDS located on an uninhabited island off the Alaska Peninsula. Objectives of the RI-CON/HTRW removal were to remove, transport, and dispose of all potential sources of contamination and associated contaminated soil contained within or emanating from prior FUDS-related activities. The objectives of the RI were to (1) identify contaminants of concern that have impacted soil, groundwater, sediment, and/or surface water; (2) fully delineate surface and subsurface soil contamination; (3) determine if groundwater contamination is present at the site and delineate to the extent practicable via monitoring wells; and (4) determine if sediment and surface water contamination exists at the site. A key RI objective was to collect adequate data to incorporate into a baseline risk assessment.
- **Project Manager, Fort Richardson Landfill Monitoring, USACE Alaska District, Joint Base Elmendorf-Richardson (JBER), Alaska (04/2011 – 03/2014; $921K).** Supported monitoring activities at the Fort Richardson Landfill. Supervised the preparation and submittal of an updated monitoring plan, which included a Quality Assurance Project Plan (QAPP), Sampling and Analysis Plan (SAP), Accident Prevention Plan (APP), and Site Safety and Health Plan (SSHP). Reporting requirements included the preparation and submittal of annual monitoring reports and quarterly technical memorandums. Annual monitoring reports included statistical trend analysis. Key components of monitoring activities included the installation of new compliance and background groundwater monitoring wells, performance of annual groundwater detection monitoring, performance of quarterly groundwater detection monitoring, quarterly and annual gas probe monitoring, and the performance of landfill maintenance activities. Landfill maintenance activities included installation of new access gates, landfill cap, and drainage ditch restoration, and the repair of security fencing. Coordinated all field work and coordinated subcontractors. Performed cost-tracking and prepared and submitted invoices to the USACE PM.
- **Project Manager/Senior Waste Specialist, UST Corrective Action Hot Tanks, USACE Alaska District, JBER, Alaska (09/2010 – 03/2013; $365K).** This project included corrective action activities at seven sites across Fort Richardson. Prepared planning documents to guide and support UST corrective action procedures, prepared and submitted pay estimates using ENG Form 93 with supporting documentation, coordinated subcontractors, and performed overall management of the project. Actions performed included excavating and disposing petroleum-impacted soil, backfilling excavations from a clean borrow source, installing soil borings using air rotary drilling methods, installing compliance and background groundwater monitoring wells, and collecting soil and groundwater samples for laboratory analysis. Upon conclusion of corrective action activities, Corrective Action Reports were prepared and submitted documenting all field activities performed.

- **Project Manager/Senior Waste Specialist, Class V Underground Injection Control (UIC) Closure, Building 722, USACE, Alaska District, JBER, Alaska (06/2010 – 12/2010; $273K).** Responsibilities included preparing planning and final reporting documents, cost-tracking, invoicing, scheduling of subcontractors and vendors, and meeting with stakeholders including the USACE PM and Fort Richardson Department of Public Works. Prepared all required waste stream profiling and manifesting paperwork and coordinated all subcontractors. The project included the excavation and removal of a 1940s-era septic tank and cesspool. Conducted soil sampling for site characterization, confirmation, and waste stream disposal. Performance evaluation sampling was a required part of the project. Excavated, transported, and removed approximately 170 tons of petroleum hydrocarbon-impacted soil.
- **Senior Waste Specialist, Removal of Polychlorinated Biphenyl (PCB)-Containing Transformers at a FUDS, USACE, Albuquerque District, Deming, New Mexico (04/2010 – 11/2010; $640K).** Project was at the former Deming Army Airfield. Oversaw the preparation of all waste material profiling and manifesting paperwork required for proper disposal. Supervised the subcontractor and the removal, packaging, transportation, and disposal of TSCA-regulated PCB waste from the site to the disposal/recycling facility.
- **Project Manager, Native American Lands Environmental Mitigation Program (NALEMP) RA, and Site Investigation (SI), Native Village of Savoonga (NVS), Native Village of Northeast Cape, St. Lawrence Island, Alaska (01/2009 – 06/2015; $568K).** Prepared the planning documents, conducted a reconnaissance of all sites, performed a hazardous materials building survey, and collected samples from areas of concern. Prepared the Reconnaissance Report and helped the NVS plan the next phase of work. Project site was the Native Village of Northeast Cape “Fish Camp” located at the Northeast Cape of St. Lawrence Island, Alaska. The NALEMP was developed by the Department of Defense (DoD) to address environmental issues from past DoD activities on Indian lands. The NVS obtained funding under the NALEMP Program from the USACE to identify and mitigate military impacts to Native land. Bristol subcontracted to the NVS to assist them in conducting the first phase of the SI/RA at several areas of concern and supported the tribe with the preparation of Fiscal Year 2009-2012 Facilitated Cooperative Agreement documents between the tribe and the USACE. In 2011, coordinated the onsite combustion of nonhazardous building debris and the collection and subsequent shipment of lead-based paint-containing construction debris and asbestos-containing material offsite. For 2012, scheduled field activities included the collection and management of remaining debris; the offsite shipment of non-burnable, nonhazardous debris; the offsite shipment of hazardous materials found onsite during the site investigation; and the performance of a site investigation, including the collection of surface water, sediment, and soil samples for laboratory analysis. In 2014, PCB-contaminated soil was excavated and removed from the site followed by confirmation soil sampling.
- **Senior Waste Specialist, NE Cape In Situ Chemical Oxidation (ISCO) (Phase I ISCO), Intrusive Drum Removal/Landfill Cap, and Removal Action Project, USACE, Alaska District, Northeast Cape of St. Lawrence Island, Alaska (04/2009 – 12/2014; $67M).** Supported the preparation of waste management planning documents. Responsible for proper characterization, containerization, and profiling of waste streams for disposal. This project also required the preparation of nonhazardous and uniform hazardous waste

manifests and Canadian transit notices and movement documents. The shipping of RCRA and Non-RCRA waste by barge from a remote site in an Alaska subarctic setting presented a series of logistical challenges.

- **Project Manager, NALEMP Site Reconnaissance, Debris Removal, and Investigation, Tetlin Village Council (TVC), Multiple Sites, Tetlin, Alaska (09/2009 – Present; $400K).** Prepared the planning documents including the Strategic Project Implementation Plan and Work Plans. Field work conducted in 2011, 2013, and 2015 included the performance of a subsurface investigation utilizing a Geoprobe direct-push drilling rig, the installation of temporary well points, and the collection of groundwater and subsurface and surface soil samples. Test pits and trenches were excavated near debris fields to assess whether buried metal and/or debris were present and to facilitate the collection of additional soil samples for laboratory analysis. Background surface soil samples were collected from each allotment and analyzed for RCRA metals. Field work included the identification, containerization, and removal of hazardous and nonhazardous environmental hazards, including drums and debris. Logistical challenges included the coordination of mobilization/demobilization to the site, the removal and transport of nonhazardous debris to the local landfill, and the removal, transport, and disposal of hazardous materials to properly permitted TSDFs. Additional site investigation and removal action field work was performed at the Midway Lake and Midway Lake North NALEMP sites in 2015.
- **Project Manager/Senior Waste Specialist, NALEMP SI and RAs, Gulkana Village Council (GVC), Gulkana, Alaska (09/2008 – Present; $565K).** Prepared the planning documents, conducted a reconnaissance of all the sites, and site investigations and removal actions from areas of concern. Prepared SI and RA reports on behalf of the GVC. The NALEMP was developed to address environmental issues from past DoD activities on Indian lands. The Village of Gulkana, Alaska, obtained funding under the NALEMP Program from the USACE to identify and mitigate military impacts to Native land. Bristol subcontracted to the GVC to assist them in conducting the first phase of an SI/RA at several areas of concern.
- **Project Manager, Leaking Underground Storage Tank (LUST) Investigations and Remediation, U.S. Environmental Protection Agency (EPA), Region 8, Several States (09/2008 – 09/2011; $1.2M).** Supervised the performance of site assessments/ characterizations and/or remedial actions at 12 sites on five reservations. Responsible for contracts, budgets and invoices, monthly progress reports to the EPA, and oversight of all field activities and reports. This work was performed under a three-year contract with EPA to investigate and remediate LUST sites on Indian Lands in Colorado, Montana, North and South Dakota, Utah, and Wyoming. Project work included installing soil borings and groundwater monitoring wells, collecting analytical samples, evaluating and upgrading existing remediation systems, designing and installing remediation systems, and removal actions including soil excavation and removal, and groundwater monitoring well pumping and removal.

Professional Experience

- **Contract Manager, Emerald Alaska, Inc. (02/2001 – 09/2008).** Played a vital role on the Defense Logistics Agency (DLA)/Defense Reutilization and Marketing Office (DRMO) contract that Emerald held for the military in the State of Alaska. Ensured that all contract requirements were fulfilled accurately and within specified time constraints. With support from the team, ensured that all service requests for hazardous waste management from the U.S. Army, U.S. Air Force (USAF), Coast Guard and National Guard were completed correctly, according to all RCRA/DOT/TSCA regulations. Primary responsibilities included project and contract oversight, interpreting data, decision making, and preparation of all necessary paperwork to properly manage and transport all hazardous and nonhazardous wastes to final disposal facilities. Also supervised environmental specialists and other project personnel on a variety of commercial customer projects, both locally and in remote locations.
- **Transportation Manager, Emerald Alaska, Inc. (02/2001 – 09/2008).** Primary responsibility was to coordinate and provide all proper documentation for shipping hazardous and nonhazardous wastes from Anchorage to the Lower 48 via road, rail, air, and marine systems. Some of the documentation prepared included the following: bills of lading, hazardous and nonhazardous waste manifests, Canadian manifests, and transit notices. Coordinated inbound and outbound loads to maximize efficiency, reduce costs, and remain compliant with transfer facility waste storage times. In 2004, managed the incident-free transportation of over 12 million pounds of hazardous and nonhazardous wastes to both intrastate and interstate destinations.
- **Philip Services Corp., Anchorage, Alaska (03/1995 – 02/2001).**
  - Environmental Specialist II, Foster Wheeler, St. Lawrence Island, Alaska (05/2000 – 10/2000). Served as the on-site regulatory specialist on a remedial action and demobilization project for the USACE. Directly responsible for all regulatory compliance in regards to the following agencies: EPA, Alaska Department of Environmental Conservation (ADEC), CERCLA, and TSCA. Guided field personnel in the characterization, consolidation, sampling, and shipment of all hazardous and nonhazardous waste materials off site.
  - Environmental Specialist II, Linder Construction, Pedro Dome, Alaska. (05/1999 – 08/1999). Directly responsible for the shipment of all TSCA-regulated wastes off site during a PCB excavation and removal project for the USACE. Prepared and submitted all related and required paperwork to Linder and the USACE representative for review and approval. Labeled, marked, and placarded all waste containers for shipment and coordinated all waste loading and off-loading activities between each waste transporter.
  - Environmental Specialist II, UIC Construction, Barrow and Kotzebue, Alaska (05/1999 – 07/1999). Supervised the removal of hazardous and nonhazardous wastes from the borough landfills. Prepared and completed all required paperwork and properly containerized, labeled, marked, and shipped all waste off site.
  - Environmental Specialist II, Phillips Alaska, Inc./British Petroleum (BP), Prudhoe Bay and Kuparuk Oilfields, Alaska (03/1999 – 02/2001). Served as the project manager for the ongoing waste management contracts with Phillips/BP. Responsible for properly containerizing, labeling, marking, and shipping of all waste materials off site. Primarily responsible for the preparation of all required paperwork to properly manage and transport

all hazardous and nonhazardous wastes off site and to final disposal facilities according to all applicable laws and regulations.

- Environmental Specialist II, Bristol Environmental Services (BES), Togiak and Alaska Peninsula National Wildlife Refuges, Alaska (11/1998). Responsible for the remote waste cleanup of a radio antenna site and the cleanup of abandoned drums along the Bristol Bay coastline. Daily transportation was via helicopter. Also responsible for properly containerizing, labeling, marking, and shipping all waste materials off site.
- Environmental Specialist II, Jacobs Engineering Group, Inc., Cape Chiniak, Kodiak, Alaska (09/1998). Conducted environmental sampling of soil stockpiles and excavations at an interim remedial action project at Little Navy Annex and Cape Chiniak Tracking Station. Also responsible for the proper characterization, labeling, loading, placarding, and manifesting of hazardous waste shipments off site.
- Environmental Specialist II, BES/Nugget Joint Venture, King Salmon, Alaska (06/1998 – 07/1998). Worked on a remedial action cleanup at Rapids Camp for the U.S. Air Force. Various duties included the proper containerizing, labeling, marking, and shipping of all waste materials off site. Conducted environmental sampling of a soil excavation, abandoned drums, and soil at various other sites. Responsible for maintaining records and reporting all findings to the Joint Venture (JV), the USAF representatives, and the ADEC.
- Environmental Laborer, Linder Construction, Adak Naval Station, Alaska (02/1998 – 04/1998). Worked as a laborer on a tank cleaning and fuel pipeline pigging project. Participated in the cleaning and purging of six large-volume fuel tanks and a 10-inch gasoline fuel line.
- Environmental Specialist II, BES/Nugget JV, King Salmon, Alaska (07/1997 – 10/1997). Conducted sampling of unknown hazardous waste drums that were excavated from a barrel dumpsite at a remedial action cleanup at the local U.S. Air Force base. Conducted air, liquid, and soil sampling using various field-screening techniques and equipment. Photoionization detectors (PIDs), immunoassay test kits, and the HAZCAT® Chemical Identification System were employed. Directed a crew of laborers in the maintenance of the drum accumulation pad. Responsible for maintaining records and for reporting all findings to the JV, the USAF representatives, and the ADEC.
- Environmental Specialist II, Oil Spill Consultants, National Park Service, Alaska (07/1997 – 10/1997). Responsible for the cleanup and disposal of hazardous and nonhazardous wastes generated from six national parks around the State of Alaska. Directly responsible for the proper identification, packaging, marking, labeling, and loading for shipment of all waste.
- Environmental Specialist, CET, Grand Forks, North Dakota (05/1997 – 06/1997). Worked on the Red River Flood Disaster Relief. Supervised the collection, handling, transportation, and disposal of household hazardous waste collected during the relief effort.
- Environmental Specialist, City of Kodiak, Dog Bay Harbor (05/1997). Active participant in the inerting and removal of a 6,000-gallon used oil underground storage tank. Assisted in the removal of the tank and screening of the surrounding soil using qualitative methods such as visual, olfactory, and PIDs. Participated in the collection of confirmation and characterization soil samples from the excavation and excavated soil stockpile.

- Site Supervisor/PM, Kenai Peninsula Borough, City and Borough of Kodiak Island, and City of Juneau, Alaska (05/1997 – 02/2001). Managed the household hazardous waste (HHW) contracts that Phillips held with the cities and boroughs. Site Supervisor during the completion of HHW/Conditionally Exempt Small Quantity Generator (CESQG) collection events and industrial waste pick-ups for the three cities and boroughs. Primary responsibilities included developing health and safety plans, project schedules, budgeting, consolidation, and preparation of monthly and semi-annual reports.
- Facility Supervisor/PM, Municipality of Anchorage, Anchorage Regional Landfill, Alaska (04/1996 – 04/1997). Managed the facility crew at a year-round HHW/CESQG collection facility. Completed billing and month-end reports and served as the liaison between the public, the Municipality of Anchorage, and Philip Services. Also served as the facility safety and spill contingency coordinator and as the regulatory compliance officer. Managed inventories of volume of wastes in storage and supplies on hand. Directly responsible for all waste shipments off site. Hired temporary employees during peak business months.
- Chemist/Environmental Specialist/Lead Technician, Municipality of Anchorage, Anchorage Regional Landfill (03/1995 – 04/1996). Sampled and identified unknown hazardous materials and performed Quality Assurance/Quality Control (QA/QC) on the various facility waste streams. Primary duties included lab packing chemicals for shipment and disposal, recordkeeping, and supervision of the facility crew. Directly responsible for accepting and checking all waste into the facility received from the public, as well as the proper and safe consolidation of these wastes. Also held accountable for all waste shipments out of the facility and ensuring that these shipments complied with all DOT/EPA regulations. Conducted facility inspections, led safety meetings, and functioned as the facility manager during the manager's absence.

- **Fish and Wildlife Technician I, State of Alaska Department of Fish and Game, Anchorage and Fairbanks, Alaska (06/1994 – 09/1994).** Monitored and sampled the commercial fishery on the lower Yukon River. Duties included scale sampling, age/sex/length determinations, interpretation of data, and heavy interaction with the local fishing population. Also worked on a remote sonar project on the upper Yukon drainage performing remote camp maintenance and the collection of biological data.
- **Laboratory Technician, Northwest Technical Services, Prudhoe Bay, Alaska (Summer 1991).** Temporary employee contracted to Atlantic Richfield Company (ARCO) to work in the Prudhoe Bay Oil Field. Stationed at Flow Station 2 in the post-water treatment laboratory and performed qualitative analysis on the water and oil streams throughout the plant. Conducted oil/water extraction techniques and reported findings to plant operators and to the main laboratory.
- **Laboratory Technician, Northwest Technical Services, Kuparuk Oil Field, Alaska (Summers of 1989, 1990, and 1992).** Temporary employee contracted to ARCO to work in the Kuparuk Oil Field, stationed at the Seawater Treatment Plant. Foremost responsibility was to conduct qualitative analyses on the various water streams throughout the plant. Tests conducted included total suspended solids (TSS), pH, salinity, and residual chlorine. Reported findings to the plant operators and to the field's head chemist. Also aided the plant operators with the basic operations of the plant when called upon.

ROBERT M. SCHLOSSER

Senior Geologist

Years of Experience

Total: 35; Bristol: 3

Areas of Expertise

Groundwater Investigations

Surface and groundwater interactions

Project Management

Field Supervisor

Logistics

Health and Safety oversight

Quality Assurance

Training and Certifications

Current 40 Hr. HAZWOPR

HAZWOPR Supervisor

30 HR. construction safety

Current First Aid and CPR

Registration

Certified Professional Geologist. #10941, AIPG
Professional Geologist, #590, AK
Professional Geologist #4865, TN

Affiliations

American Institute of Professional Geologists

National Groundwater Association

Education

B.S., Geological Sciences, Mesa State College, Grand Junction, Colorado, 1983

Mr. Schlosser has 13 years of experience as a geologist and site supervisor in oil, gas, minerals, and coal; and 19 years of experience in radiological and chemical environmental investigations and remediation. He has extensive experience in Midwest, Western, Southwestern regions of the continental United States, and Alaska environments. Mr. Schlosser is an experienced project manager, field supervisor, health and safety officer and technical writer with excellent communication and computer competency in industry-specific technical software.

As a Senior Geologist for Bristol, Mr. Schlosser is responsible for assisting project managers and engineers in development and implementation of work plans. He assists in groundwater, soil, and air assessments and trains junior personnel.

Project Experience

- **Senior Geologist, Environmental Investigations at Three Fuel Terminals, USACE, Alaska District, Northway Junction, Alaska. (08/2015 – 10/2015; $8.8M).** Acted independently as Geologist, onsite Health and Safety Officer and Sample Technician. This project involved installation of a new drinking water well that isolated diesel-contaminated groundwater in the upper part of the aquifer to meet state drinking water quality standards. The project required abandoning the existing diesel-contaminated water well to prevent further impacts to the local drinking water aquifer.

Professional Experience

- **Senior Geologist, Linc Energy Operations, Inc., Anchorage, Alaska (05/2011 – 11/2014)**. Researched coal resources located in west Cook Inlet and select Interior Alaska locations for advancement of underground coal gasification. Reviewed published data, evaluated drill hole, seismic, geotechnical and geochemical data to determine optimum drill hole placement for the evaluation of coal resources.

Developed budgets for drilling projects; evaluated suppliers and ordered drilling support supplies and materials; prepared AOGCC drilling permits; contacted, integrated and scheduled suppliers and subcontractors; scheduled barges, helicopter and ground transportation for transport of personnel, materials, and supplies to drilling locations. As operations manager at remote drill locations, responsibilities included scheduling and tracking subcontract hours and performance, ordering and tracking materials and supplies, scheduling required well inspections, preparing and submitting daily activity reports. Liaised between onsite personnel and corporate personnel. Performed independent safety oversight and identified deficiencies to corporate health and safety officer for corrective action.

- **Consulting Geologist, Owner/Principal, Geo-Consultants, Palmer, Alaska (01/2005 – 05/2011).** Performed geologic consulting for various clients, including Rio Tinto Energy America, Shell Oil, and AECOM Technical Services. Onsite company representative supervising drilling activities to ensure adherence of procedural, environmental, and health and safety directives. Geologic duties included logging drill cuttings and core, picking core points from geophysical logs, correlating geologic units, obtaining samples for quality analysis, and preparing geologic and potentiometric maps. Planned and supervised monitoring well installation for groundwater quality analysis and collected environmental samples. Onsite health and safety representative monitored workers daily activities to ensure safe work practices. Audited drilling contractors and provided feedback to client for improved HAZCOM.
- **General Partner, Hydrogeologic Consulting, Aqua VISION Environmental, LLC, Palisade, Colorado (12/1995 – 01/2015).** As general partner, performed various duties as a full service environmental firm. Primarily developed and implemented the Colloidal Borescope to determine groundwater flow direction and velocities for use in environmental and water resource evaluation. Deployed and sold on six continents, the instrument is now marketed through GeoTech Environmental Instruments, Inc., Denver, Colorado.
- **General Partner, Environmental/Geologic Consulting, Kayenta Consulting Group, Inc., Grand Junction, Colorado (10/2001 – 01/2005).** Performed environmental investigations for private companies. Assessed air, soil, surface water and groundwater to determine existence and extents of both chemical and radiological contaminants using various field techniques. Provided health and safety oversight on drilling projects as well as radiological and chemical demolition projects following procedural guidelines. Prepared detailed reports of activities and results to clients and governing bodies.
- **Project Manager/Project Geologist, Oak Ridge National Laboratory, Grand Junction, Colorado (11/1988 – 10/2001).** Performed scientific research of new technologies for cleanup of radioactive and chemical contaminants in soil and groundwater. Designed and implemented systems to measure and evaluate these technologies. Prepared planning documents and technical reports for government agencies. Other activities included: authoring, editing and reviewing documents; wrote specifications, procedures and statements of work for personnel and subcontract activities; and managed and completed field programs through coordination, supervision, and training of personnel and subcontractors in accordance with project work plans while maintaining field schedules for equipment, personnel, and other resources. Conducted field investigations for chemical and radioactive wastes, including installing monitoring wells; analyzing borehole cuttings for lithologic and

hydrologic parameters; preparing borehole and well completion logs; supervising drilling and well completion activities; collecting soil, surface water, sediment and groundwater samples; and conducting geophysical surveys using various ground penetrating devices and radioactive sources. Trained new or inexperienced field staff in the use of field equipment and procedures. Evaluated employee performance and provide input for hiring of employees. Conducted Quality Assurance audits of projects, including field procedures, records, and other critical data.

- **Health Physics Technician Oak Ridge National Laboratory, Grand Junction, Colorado (09/1985 – 11/1988).** Performed technical duties including acting as Health and Safety officer on RI projects; monitoring work sites for possible hazards; and calibrated, maintained and repaired Health and Safety instruments. Operated field gas chromatograph to determine volatile constituents in groundwater and soil on site. Wrote and reviewed reports. Sketched, surveyed and prepared computer graphics of properties. Performed radiological surveys using alpha, gamma, and beta detection instruments at D.O.E. facilities at various locations throughout the U.S. QA/QC coordinator duties included auditing field and environmental, and health and safety procedures and making recommendations for improvements and corrective actions.
- **Consulting Geologist, Larsen Geologging, Lafayette, Colorado (08/1983 – 09/1985).** Evaluation of drill cuttings, core samples, electric logs, drill stem tests and gas chromatograph logs for oil and gas exploration and reserve estimates. Direct contact between drilling contractor and client.