Environmental Assessment

Yerrick Creek Hydroelectric Project
Mile Post 1339, Alaska Hwy
20 Miles West of Tok, Alaska

Prepared for:
U.S. Department of Agriculture
Rural Utilities Service (RUS)

Prepared by:
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SUMMARY

The USDA Rural Utilities Service (RUS) has selected the Alaska Power & Telephone Company (AP&T) as a finalist in its High Energy Cost Grant Program to construct the proposed Yerrick Creek Hydroelectric Project (or Project). The proposed Project would be located approximately twenty miles west of Tok, Alaska, at Mile Post 1339 on the Alaska Highway. The proposed Project would supply renewable energy to four communities in the Tok area: Dot Lake, Tanacross, Tetlin, and Tok. Prior to making an award for a partial grant, RUS has determined that an Environmental Assessment (EA) must be prepared, pursuant to 7 CFR Part 1794, RUS's Environmental Policies and Procedures, as amended.

This EA identifies environmental impacts associated with the construction and operation of the proposed Project. It has been decided that impacts associated with upgrading the supporting transmission system would be minimal, as the infrastructure already exists and would only require minor upgrading and the stringing of a higher voltage conductor. All of this work would occur in previously disturbed rights-of-way that previously have been cleared of vegetation. The Project would be located on lands owned by the state of Alaska and Tanacross, Inc.

This proposed Project is needed because the communities of Dot Lake, Tanacross, Tetlin, and Tok rely on diesel generation for their electricity, which is expensive and fluctuates frequently. The Project would reduce electric rates to these four communities by approximately 20%. Several of these communities are on the Denali Commission's list of distressed communities[1] as this area is experiencing a significant economic downturn. Reducing electric rates may help the local economy.

The results of the impact analysis show the project may have the follow environmental affects:

- Temporarily impact wildlife due to noise from construction activity, which may temporarily impact hunting in the area
- Have a minor impact to wetlands, by placing fill in the creek (i.e. diversion structure, bridge piers (2), part of tailrace)
- Have a minor impact to Dolly Varden and Arctic grayling in the bypass section of Yerrick Creek during winter and late summer months because of low flow
- Provide easier access for recreation, potentially disturbing wildlife
- Reduce the use of diesel in Tok, which in turn would reduce air emissions of green-house gases and particulate matter as well as reducing opportunities for fuel spills

[1] Dot Lake, Tanacross, and Tetlin are on the 2009 Denali Commission list of distressed communities. Tok was on the 2008 list.

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LIST OF ACRONYMS & ABBREVIATIONS

%	percent
ADF&G	Alaska Department of Fish & Game
AKNHP	Alaska National Historic Preservation
ALA	
APE	area of potential effect
AP&T	Alaska Power and Telephone
ATV	All terrain vehicle
cfs	cubic feet per second
CO_2	carbon dioxide
DNR	Alaska Department of Natural Resources
EA	Environmental Assessment
HDPE	
kV	kilovolt
kWh	kilowatt-hour
MW	megawatt
NEPA	National Environmental Policy Act
OHW	Ordinary high water (mark)
pop.	population
ROW	right-of-way
RUS	Rural Utilities Service
SHPO	State Historic Preservation Office
TES	threatened, endangered, and sensitive (species)
USACOE	U.S. Army Corp of Engineers
USGS	U.S. Geological Service

1 INTRODUCTION

The USDA Rural Utilities Service (RUS) has selected the Alaska Power & Telephone Company (AP&T) as a finalist in its High Energy Cost Grant Program to construct the proposed Yerrick Creek Hydroelectric Project (20 Miles west of Tok, Alaska at Mile Post 1339, Alaska Hwy). The granting of funds by RUS is a federal action subject to environmental impact review, pursuant to the National Environmental Policy Act (NEPA) and RUS's NEPA implementing regulations, Environmental Policies and Procedures, 7 CFR Part 1794, as amended. RUS has determined that an Environmental Assessment (EA) must be prepared for this Project. This EA provides an analysis of potential environmental impacts, which may result from RUS's action related to this proposal. RUS Bulletin 1794A-601, "Guide for Preparing an Environmental Report for Electric Projects Requiring an Environmental Assessment," was used as guidance in the preparation of this EA. In addition to fulfilling its obligations under NEPA, this EA also documents RUS's compliance with Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species Act, and other applicable environmental laws and regulations.

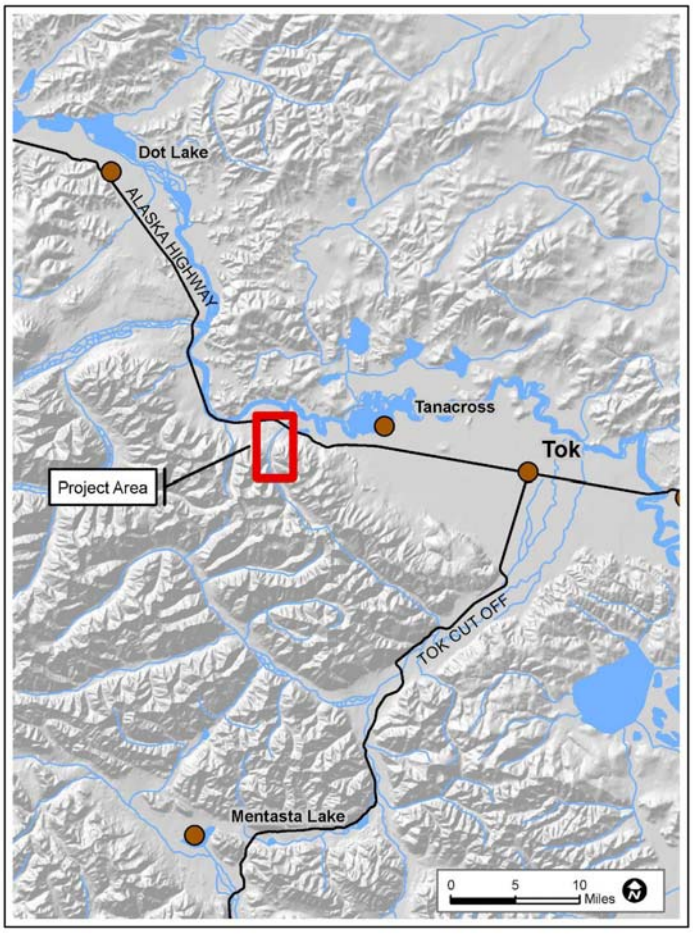
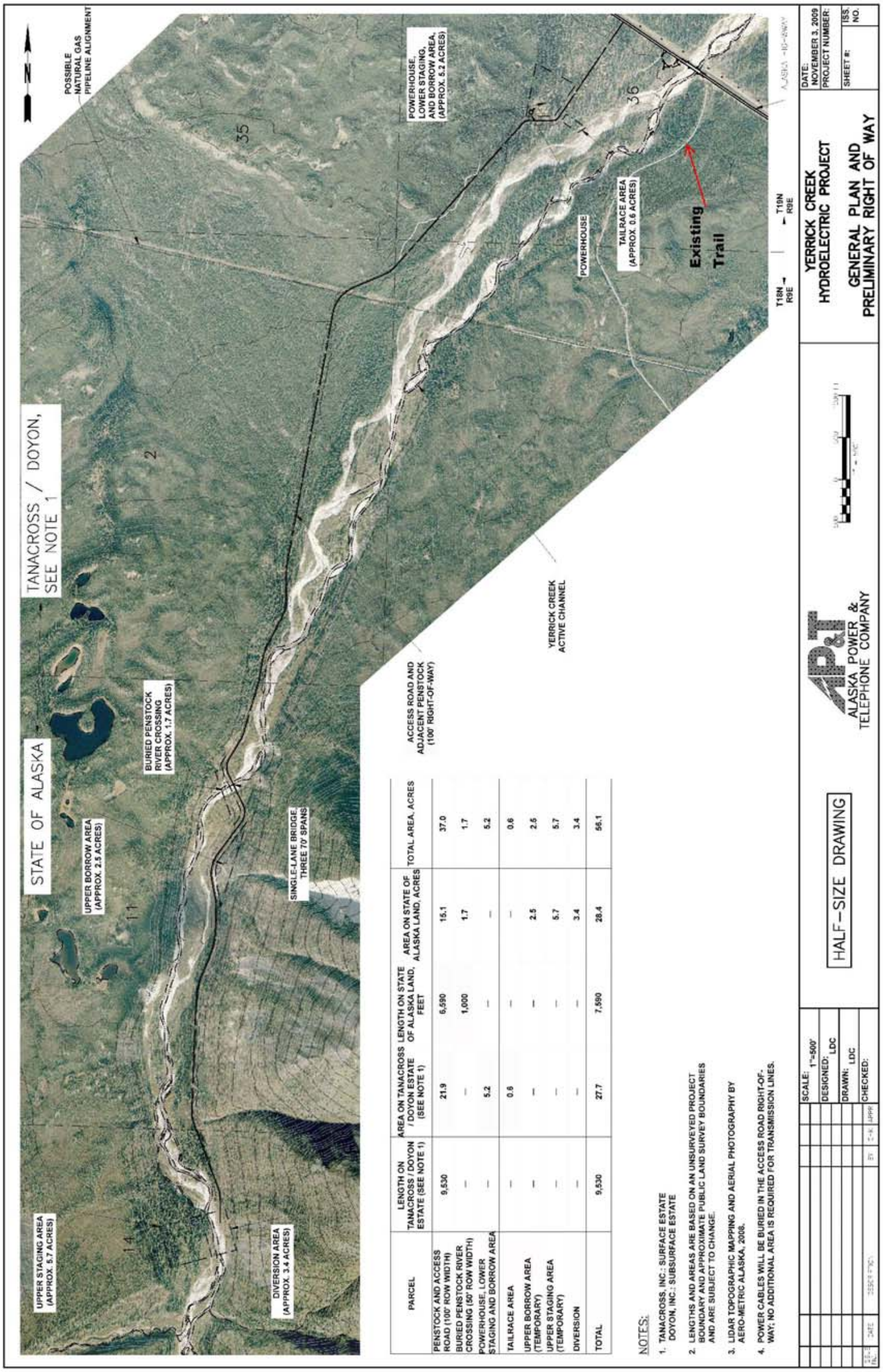


Figure 1: Map of Proposed Project Area



PARCEL	LENGTH ON TANACROSS / DOYON ESTATE (SEE NOTE 1)	AREA ON TANACROSS / DOYON ESTATE (SEE NOTE 1)	LENGTH ON STATE OF ALASKA LAND, FEET	AREA ON STATE OF ALASKA LAND, ACRES	TOTAL AREA, ACRES
PENSTOCK AND ACCESS ROAD (100' ROW WIDTH)	9,530	21.9	6,590	15.1	37.0
BURIED PENSTOCK RIVER CROSSING (50' ROW WIDTH)	—	—	1,000	1.7	1.7
POWERHOUSE, LOWER STAGING AND BORROW AREA	—	5.2	—	—	5.2
TAILRACE AREA	—	0.6	—	—	0.6
UPPER BORROW AREA (TEMPORARY)	—	—	—	2.5	2.5
UPPER STAGING AREA (TEMPORARY)	—	—	—	5.7	5.7
DIVERSION	—	—	—	3.4	3.4
TOTAL	9,530	27.7	7,590	28.4	56.1

NOTES:

1. TANACROSS, INC.: SURFACE ESTATE
   DOYON, INC.: SUBSURFACE ESTATE
2. LENGTHS AND AREAS ARE BASED ON AN UNSURVEYED PROJECT BOUNDARY AND APPROXIMATE PUBLIC LAND SURVEY BOUNDARIES AND ARE SUBJECT TO CHANGE.
3. LIDAR TOPOGRAPHIC MAPPING AND AERIAL PHOTOGRAPHY BY AERO-METRIC ALASKA, 2008.
4. POWER CABLES WILL BE BURIED IN THE ACCESS ROAD RIGHT-OF-WAY; NO ADDITIONAL AREA IS REQUIRED FOR TRANSMISSION LINES.

Figure 2: Proposed Project Features

2 PROJECT DESCRIPTION

AP&T plans to construct a 1.5 megawatt (MW) "run-of river" hydroelectric facility that would supply renewable energy to the communities of Tok, Tetlin, Tanacross, and Dot Lake, Alaska. The facility could potentially supply 100% of the communities' energy demand during high flow periods (typically June and July). During the remainder of the year, only part of the load would be met. AP&T's hydrology studies indicate there will be sufficient flow during the extremely cold winter month for the Project to operate, although at substantially reduced output. While not getting these communities completely off of diesel generation year round, the Project will be a significant first step for the area to reduce and eventually eliminate the use of fossil fuels.

The Project will consist of:

- Approximately 3 miles of single-lane access road from the highway to the diversion site. The clearing width for the road will generally be 40-50 feet, but may be somewhat wider in areas of significant ground slope due to the widths of cuts and fills. The right-of-way (ROW) width will be 100 feet to provide for minor field adjustment of the alignment if necessary. The road will cross Yerrick Creek at one location about 2 miles from the highway; the bridge will be about 200 feet long.
- A diversion structure at about El 2220, just below the confluence of the main stem of Yerrick Creek and two tributaries. The diversion structure will include a concrete-faced rockfill dike on the west abutment, a concrete-faced rockfill spillway and roughened channel outlet in the central portion, and a concrete intake on the right abutment.
- A buried pipeline approximately 15,000 feet in length (known as a penstock) using 42-inch HDPE pipe for the upper 55% and 36-inch ductile iron pipe for the lower 45%. The penstock will cross Yerrick Creek just above the bridge noted above; it will be buried below the stream channel and encased in concrete.
- A powerhouse approximately 1,500 feet upstream of the Alaska Highway where the water will pass through a single turbine to the tailrace. Other powerhouse equipment will include the 1500 kW generator, controls and switchgear, bridge crane, and pad-mount transformer. The powerhouse structure will be a metal building set on a concrete foundation.
- A tailrace consisting of a pond and 800 feet of excavated canal to an existing overflow channel of Yerrick Creek. The pond will be formed in a borrow pit excavated to provide fill material for the access road. The pond is expected to develop a stable ice cover in winter that will allow the turbine to discharge without glaciering.
- A transmission line consisting of 1,500 feet of 12.4 kV underground transmission cable from the powerhouse to the highway and 10 miles of upgraded 12.4 kV overhead transmission line adjacent to the highway (see Figure 3),

Based on the hydrology studies conducted to date (see Appendix 9.2), AP&T has selected a hydraulic capacity for the Project at 60 cfs, which will provide a generating capacity of 1,500 kW. The streamflow will only exceed the hydraulic capacity during the early summer (typically June and July), or about 10%-20% of the year. This is a relatively low exceedence level for a run-of-river project, but AP&T believes the high capacity is

worthwhile because of the high cost of diesel generation. Before pipe and generating equipment is ordered, AP&T will reevaluate the hydraulic capacity. It could be reduced to perhaps 50 cfs, which would allow a reduction in the penstock diameter from about 42 inches to 36 inches. The environmental impacts would be virtually the same with a smaller capacity, therefore the conclusions of this EA would not change.

During times of high flow, water will flow over the diversion structure. If the overflow is less than about 30 cfs, it will all pass through the roughened channel outlet to allow fish passage. At higher rates of overflow, water will also pass over the spillway. The duration of this overflow will be intermittent, and of course will vary with the amount of snow accumulated in the basin; during low runoff years there may be only a very short period of overflow, but during high runoff years the overflow period may start in June and extend into August.

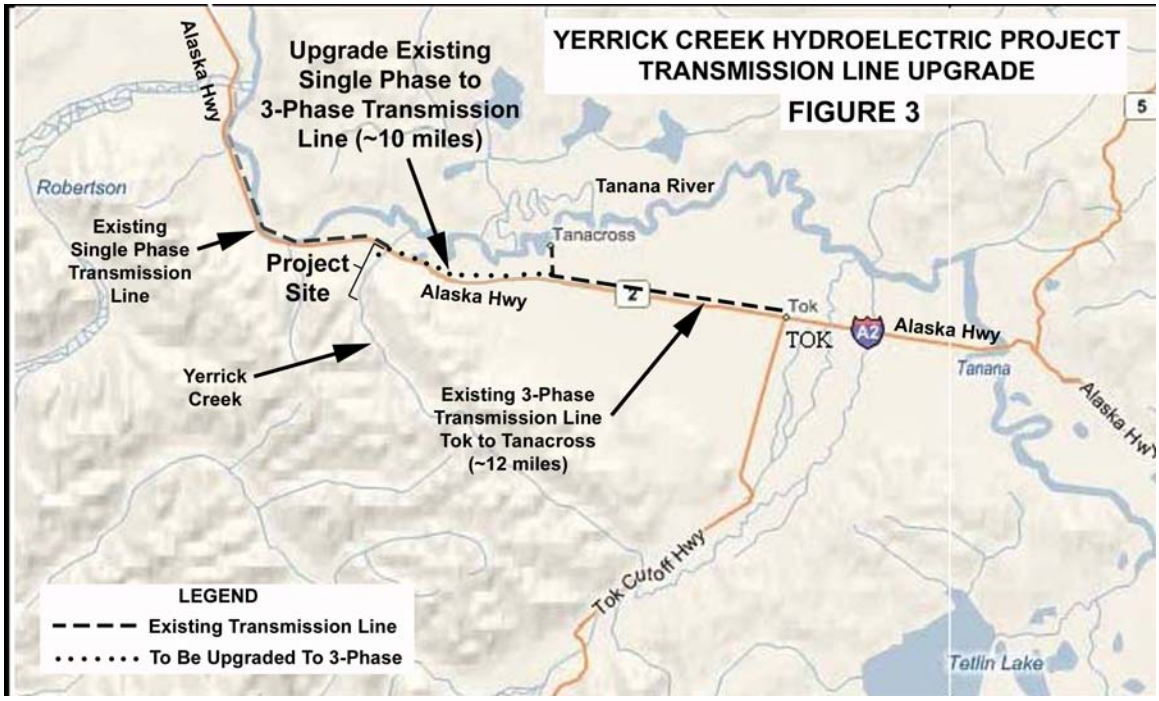


Figure 3: Transmission Line Features

The proposed Project requires state and federal permitting prior to project commencement of construction. The permits needed are: (1) a Department of Natural Resource (DNR) land lease permit; (2) DNR water rights permit; (3) Department of Fish & Game (ADF&G) habitat permit; and, (4) a U.S. Army Corp of Engineers permit. In addition, besides being on State of Alaska managed lands, this project is also on Tanacross, Inc. lands (private), which is a Native corporation. The diversion structure and approximately 7,000 feet of the penstock and access road will be on state land, the remainder of the penstock and access road as well as the powerhouse and buried portion of the transmission line will be on private land. The size of easement needed on state land will be approximately 28.4 acres. The size of easement needed on private land will be approximately 27.7 acres.

3 PURPOSE/NEED FOR PROPOSED ACTION

The purpose of this hydroelectric project is to reduce the use of fossil fuels presently used for generating electricity in the Tok area along the Alaska Highway. The communities that will benefit from this project are Tetlin (pop. 117), Tanacross (pop. 140), Dot Lake (pop. 19), and Tok (pop. 1,393), Alaska. These communities are presently 100% reliant upon fossil fuels for their electricity. AP&T applied to the RUS for a grant for a 2.0 MW run-of-river hydroelectric project that would connect directly to the AP&T transmission system that is centralized out of Tok where diesel generation facilities are located. Based on further hydrologic analysis, the facility is currently being designed with a 1.5 MW capacity. AP&T presently sells power for $0.47 per kWh (2009) in Tok and to other communities connected to Tok's closed grid.

The Proposed Action is needed to reduce this areas use of fossil fuels and to reduce price fluctuations and air emissions associated with diesel generation. To do this, a renewable energy resource is necessary. The proposed Project will be the first such project on this interior Alaska grid. Placing this hydroelectric project on the Tok grid will reduce electric rates to approximately $0.37 per kWh (~20% reduction). The current rate is above the RUS High Energy Cost Benchmark of *Extremely High Average per unit energy costs* ($0.239 per kWh), one of the eligibility criteria of this program. Two of the communities that would benefit from this project have large Native Alaskan populations, Tetlin 94.9%, Tanacross 88.6%.

4 ALTERNATIVES

4.1 No Action

If no action is taken, the four communities that would benefit from the proposed Project would remain on diesel generation for their electrical needs. The price of diesel fluctuates and is expected to remain high, keeping the area's electric rates high. Diesel generation also puts particulate matter and gases such as CO_2 into the air, which are related to global warming. The high volume of diesel fuel needed for this small grid increases the likelihood of spills during transport and fueling operations as well as potential leaks from storage. The transport of hundreds of thousands of gallons of fuel each year relies on the burning of fossil fuels to transport fuel, which would continue. The high cost of electricity is a stress on residential customers, schools, and businesses, suppressing economic and population growth. The increasingly expensive electrical rates may drive people away from these communities. This economically impacted area on the Alaska Highway will continue to struggle with increases in the cost of diesel fuel.

4.2 Energy Generation Technologies Considered

Other energy generation technologies considered other than hydroelectric power were hydrokinetics, wind power, and woody biomass.

A hydrokinetic project (the use of moving water to passively move a turbine placed in its flow) was evaluated for the Tanana River not far from Yerrick Creek. However, the environmental issues related to placing a turbine in this river appeared significant (possible impacts to fish, fishermen, boat traffic, subsistence use, testing of new technology, impact of floating debris). In addition, this type of technology is still being developed and tested. Hydrokinetic technology for a river turbine is presently not as efficient and the units are not very large, producing only a small amount of electricity. AP&T prefers to go with proven technology to get the best use of grant funds made available by RUS for renewable energy development as well as develop a larger project to meet more of the load.

Wind power is still being evaluated for the area. AP&T is evaluating one or two sites that look promising, but their development could be years down the road. Wind generation requires consistent wind speeds above a base velocity rather than just being a windy area. This too is experimental technology at this northern latitude and is not known to be able to startup as fast as hydro from power outages when integrated with a diesel system. Conventional hydroelectric technology can start almost instantaneously, allowing supplemental diesel generation to be brought more slowly on line. Thus, conventional hydroelectric generation is more reliable in hybrid systems like the one being proposed.

Biofuel is being considered by AP&T for the Tok grid. AP&T has been considering the possibility of a 2.0 MW-sized biomass facility using wood from the local area; however, funding was not made available to AP&T by the State of Alaska in its recent grant funding for Renewable Energy Fund Round III. This option will not be pursued in the near term unless grant funding becomes available. In order to get the communities on the Tok grid off of diesel generation, it will require a combination of renewable energy projects. However, biofuel is also less reliable than conventional hydroelectric power in that wood

would have to be purchased and would therefore be dependent on a reliable and available source.

Conventional hydroelectric power is a mature technology that is well proven. The components are readily available, and the science of finding a good site is well established. Yerrick Creek meets the requirements for a sustainable run-of-river (no storage) hydroelectric project due to relatively consistent flow throughout the year, no significant environmental issues, and no major engineering challenges. All of these contribute to keeping costs down. Hydroelectric projects also have the advantage of quick start-up time after a power outage, which is almost instantly. Hydroelectric power also integrates well with diesel generation units, making the balance between the two easy to manage. The other technologies that were considered either do not work well with quick start-ups or are relatively unproven, however, hydroelectric projects integrate well with other renewable energy projects, such as wind, because generation can be well regulated where as most other renewable energy technologies do not have consistent energy production.

4.3 Alternative Locations for siting the hydroelectric facility

Other watersheds considered by AP&T for conventional hydroelectric included:

- Cathedral Rapids Creek No. 1, just west of Yerrick Creek,
  - does not have as large a drainage area as Yerrick Creek
  - does not have enough flow year round, and
  - does not have the easy accessibility of Yerrick Creek.
- Tanana River
  - many environmental issues, particularly fish passage and sediment buildup
  - significantly greater costs to construct a project on a river versus a creek

AP&T's transmission grid passes by Yerrick Creek allowing the project to plug into the existing infrastructure, whereas other potential sites would require new transmission infrastructure because they were further away, which would lead to an increase in project costs and introduce new environmental impacts.

5 AFFECTED ENVIRONMENT

5.1 Land Use

Approximately 50% of the proposed Project is located on state managed land, and the remainder is on property privately owned by Tanacross, Inc. The portion of the Yerrick Creek basin on which the Project would be located is used by hunters for bear, moose, caribou, and Dall sheep. Trapping for small furbearers also takes place. The site is used for a combination of subsistence and recreational activities, which is typical of the general area.

Trespassing for hunting and/or trapping purposes is a concern of Tanacross, Inc., the private landowner. This sort of activity is not unusual in rural Alaska, which resembles an open range without fencing. Development of this project would provide easier access into both Tanacross, Inc. and state lands.

AP&T is considering reasonable solutions to prevent vehicular access, such as installing a locked gate at the access road's entrance point. AP&T is also willing to compensate Tanacross, Inc. for the use of its land and to mitigate the effects of trespassing and loss of land. While subsistence and recreational hunters and trappers will have easier foot access to a part of this area, wildlife hunting would remain heavily controlled and monitored by state and federal agencies that permit the amount of take allowed in the area. Therefore, although hunting is allowed in this area, a permit is necessary to harvest, and only a certain number of each species is allowed to be taken annually. This may provide some restraint for illegal use of this area.

5.2 Cultural Resources and Historic Properties

Under the provisions of the Archaeological Resources Protection Act, archeological site-location information is confidential; disclosure of such information is exempt from requests under federal and state freedom of information laws. The following reports are not public documents. They are intended for release to Alaska Power & Telephone (AP&T), the Rural Utilities Service (RUS), the Alaska State Historic Preservation Office (SHPO), Tanacross, Inc., and other consulting parties under Section 106 of the National Historic Preservation Act.

Prior to initiating consultation with consulting parties under Section 106 of the National Historic Preservation Act (Section 106), AP&T gathered information about historic properties in the general project area. On July 9, 2008, AP&T submitted a letter the Alaska State Historic Preservation Office (SHPO), which included a copy of a literature review and preliminary recommendations for additional archaeological and historic structure surveys. The Alaska SHPO responded on August 15, 2008, that it agreed with the recommendations of the report, specifically the letter stated that additional archaeological surveys should be completed for the proposed access route, powerhouse site, and penstock route and that surveys should not be needed for the impoundment area. Based on this recommendation, RUS determined that the *area of potential effect* (APE) would be the proposed locations for the access road, powerhouse site, and penstock.

By letter dated October 14, 2008, RUS formally initiated consultation with the Alaska SHPO and government-to-government consultation with the Native Village of Tanacross, Tanacross, Inc., the Native Village of Tetlin, and the Village of Dot Lake. The letter identified the project's APE, requested that additional information be provided about historic properties within the APE, and requested the participation of consulting parties (Alaska SHPO, the Native Village of Tanacross, Tanacross, Inc., the Native Village of Tetlin, and the Village of Dot Lake) in a teleconference on November 13, 2008. The purpose of this teleconference was to give a more detailed description of the project, discuss known historic properties that may be within the APE, and discuss the predicted progression of this project under Section 106. On November 10, 2008, Tanacross, Inc., provided comments in response to RUS's letter. Comments included:

- A significant portion of the project (approximately one half of the penstock route, construction and maintenance roads, and all of the powerhouse site & its auxiliary facilities [access road and transmission infrastructure]) would be located on lands owned and managed by Tanacross, Inc.

- The project would conflict with use of historic trails by members of the Native Village of Tanacross for subsistence purposes.

- The project would interfere with right-of-way development by Denali-The Alaska Gas Pipeline LLC (Denali) for the transportation of North Slope natural gas to market. The proposed location of the powerhouse would be at the same location of Denali's proposed compressor station.

Several of these concerns were addressed during the teleconference held on November 10, 2008. Meeting minutes and a formal response to Tanacross, Inc.'s letter were submitted via email to participants of the teleconference on December 17, 2008.

Representatives from the Native Village of Tanacross, Tanacross, Inc., the Native Village of Tetlin, and the Village of Dot Lake participated in the teleconference. Minutes from this meeting are included in Appendix 9.1 – Project Correspondence. Following the discussion, Tanacross, Inc., identified a historic trail used by members of Tanacross for subsistence purposes that may be within the APE of this Project. By letter dated, December 17, 2008, RUS requested that site-specific locations of the trail be identified. To date, this information has not been submitted to RUS for review.

Following the teleconference, RUS authorized AP&T to begin surveys of the APE, provided it acquired the necessary permissions from Tanacross, Inc., to access its land. In 2009, AP&T hired Northern Land Use Research, Inc. (NLUR) to conduct a cultural resource survey of the APE. The survey identified the following sites within the APE:

- TNX-156: Tanacross quadrangle segment of the Haines-Fairbanks pipeline
- TNX-074: Yerrick Creek cabin
- TNX-211: Can Dump area
- TNX-212: Construction camp site

When designing this project, AP&T treated all of these sites as eligible for inclusion in the National Register of Historic Properties, although RUS, with SHPO concurrence) have

determined that site TNX-211 is ineligible.[2] The historic trail, identified by Tanacross, Inc., was not found within the APE.

5.3 Biological Resources

Yerrick Creek is located within the Yukon/Tanana uplands physiographic province (Warhafting 1965). The climate of this area is continental with average annual temperatures ranging between -32°F and 72°F, and extreme temperatures have been measured from -60 to 99°F (ADCED 2004). The Tanana Valley is bound by low, rounded hills ranging in elevation from 300 meters to 1,500 meters (1,000 to 5,000 feet) above sea level, that are interspersed with lowland bog areas and depressions. Wildlife resources within Upper Tanana region include large game, such as moose, caribou and Dall sheep, and furbearers, such as snowshoe hare, muskrat and red squirrels (Halpin 1987). Aquatic resources include occasional whitefish, arctic grayling, and Dolly Varden, while avian resources include geese, ptarmigan, ducks and grouse. A literature search indicates that these species exist in the Yerrick Creek area.

The Alaska Range lines the southern horizon of the project area beyond the low-lying hills. The higher relief hills are typically igneous intrusions that sometimes have extensive rock exposures and shallow soil deposition, whereas the lowlands are often characterized by vegetated loess dunes and thick organic layers covering permafrost. The area surrounding the Tanana River is dotted with lowland lakes and small creeks. Yerrick Creek flows north from the Alaska Range before joining the Tanana River.

Yerrick Creek is a cascading stream with fast flow with some "islands" of vegetation present in the channel, but for the most part the channel consists of braided sand, gravel, and cobble bars with some large boulders. Old meander channels and lower elevation vegetated creek banks exhibit signs of recent and past vegetation log jams from spring break up. Vegetation in the project area consists of an upland spruce-hardwood forest. Dominant trees include black and white spruce, paper birch, quaking aspen and cottonwood. Willow and alder shrubs are also present in recently disturbed areas. Understory shrubs include dwarf birch, wild rose, Labrador tea, high bush cranberry and raspberry. The dominant forest ground cover noted include toad flax, bog and low bush cranberry, Sphagnum moss, lichens, blue joint grasses and horsetail.

Initially, AP&T submitted a Draft Study Plan to the resource agencies to determine what studies were needed and what information was lacking in their biological analysis of the site. Based on comments received from ADF&G on September 3, 2008, the study of mammals was not necessary because there was significant information already available on agency websites, which was included in AP&T's Study Plan. Fish species, plant surveys, and a wetland determination, however, were conducted.

5.3.1 Fish Resources

For most of its length, Yerrick Creek is a cascading stream with fast flow and boulder substrate. The stream generally comprises one to three channels, within a wide dynamic

[2] March 24, 2010, letter from SHPO to RUS.

(scoured) perimeter. Apparent fish habitat consists of widely spaced, very small (~10-foot long) pools behind large boulders or logjams. Roughly one mile before the creek joins the Tanana River, the habitat is significantly different; flow is much slower and the habitat is composed mostly of sand. In this "delta" area, there are three main channels with several smaller channels which leave and rejoin the larger channels, and at least one large area ("city block" in size) through which the creek flows more-or-less overland, in very shallow channels among dense spruce trees. In between these two reaches is a transition zone, where flow is intermediate in strength and substrate is small rocks and large gravel. This transition zone is only a few hundred yards long. Complicating this situation is the fact that the surface water flowing in the creek is not always continuous within the river. Because of the porous substrate, the water sometimes disappears from the surface and flows underground.

Fish surveys were conducted by a qualified fish biologist, Stephen Grabacki (Anchorage), who conducted surveys in 2008 on September 3-4 and 29-30 and in 2009 on May 19-20, May 27-29, and June 7. A report on the fish surveys can be found in Appendix 9.3.1 – Fish Resource Report. Mr. Grabacki stated, "*The stream bed morphology indicates that even when there is surface flow, the quality of the habitat is limited and the larger rock moved during the high flow periods reduces the quality of fish habitat*."

Based on sampling in early September 2008, and on the three sampling sessions in May-June 2009, an understanding of Dolly Varden (*Salvelinus malma*) and Arctic grayling (*Thymallus arcticus*) use of Yerrick Creek seems to have emerged. Grayling appear to use parts of Yerrick Creek (below and within the bypass reach) for summer feeding, on an opportunistic basis. No evidence was found to support that grayling spawn in Yerrick Creek:

- The creek did not connect to the river at the expected time of grayling spawning
- No aggregations were observed of grayling anywhere in Yerrick Creek; all grayling observed in the creek in May-June 2009 appeared to be individual fish
- No adult-size grayling were observed, and the largest grayling observed in June 2009 (a 2- or 3-year-old) did not appear to be in either a pre-spawning or post-spawning condition.

Studies conducted showed that the majority of Dolly Varden (DV) year-round habitat is above the diversion site. During a May 2009 meeting between ADF&G and AP&T, ADF&G acknowledged that this Project would not significantly impact DV (it was at this time AP&T was directed to focus on studying Grayling use of the creek). Studies confirmed that there is little over-wintering refugia in the bypass portion of the creek so that any loss of over-wintering refugia will have minimal impact to DV.

5.3.2 Wildlife (mammal) Review

Wildlife is not expected to be significantly impacted by the proposed Project, either by construction or operation. Species that use the proposed Project area are not considered threatened, endangered, or listed species of concern (TES). A literature search conducted by AP&T does not point to any TES using this basin, although some may occasionally pass through during migration. Of the many species that do use the Yerrick Creek area, Game

Management Unit 12, some are hunted for their meat (moose, caribou, Dall sheep, black and brown bear) and trapped for their pelts (lynx and marten), or harvested because they kill other preferred game, i.e., wolves. There will be a minimal loss of habitat types from project features:

- The powerhouse, staging area, and lower borrow area are near the Alaska Highway and a total of approximately 5.2 acres will be cleared.
- The tailrace will require clearing approximately 0.6 acres.
- The access road/penstock route will require approximately 38.7 acres of clearing.
- The upper borrow area will require approximately 2.5 acres, however this is mostly exposed bedrock.
- The upper staging area will require approximately 5.7 acres of clearing, but will be allowed to revegetate after construction.
- The diversion area covers 3.4 acres, but little of this has vegetation.

The habitat type for the project area is typically open paper birch – white spruce forest. Open balsam poplar–white spruce forest and open white spruce forest habitats are found in drier portions of the Project area. Open black spruce forest and open dwarf black spruce forest occupy areas with poorly drained soils. Closed tall alder or willow scrub occupies the transitional areas between forested areas and creek channel. This habitat type is common throughout this drainage basin as well as other drainages along the Tanana River that Yerrick Creek drains into.

ADF&G in a July 1, 2008, letter to AP&T, requested that the penstock and access road remain a minimum of 66 feet from the creek accept when intersecting with the diversion structure or powerhouse; however, it is necessary to cross the creek due to perma frost, wetlands, and steep slopes found further south on the west side of the creek. A single-lane bridge would be used to cross the creek and the penstock would be buried under the creek to avoid damage from flooding that occurs in this wide, dynamic creek. The penstock (pipe) would be passable to wildlife because it will be buried along the access road. This Project is viewed as having limited impacts to wildlife in the area. The main concern would be whether this project will provide easier vehicular access into this basin for hunters and trappers, which could place more pressure on wildlife.

However, in regards to increased hunting pressure, sport and subsistence hunting go hand-in-hand in this area, although most is by Alaskan hunters and is therefore most likely for subsistence. All hunting is controlled by permit in this area and there is a limit to how many of each species can be harvested in a given year. This places a control on harvesting these species regardless of whether there is improved access to this drainage or not.

Big game that use Game Management Unit 12 are black and brown bear, moose, and possibly migrating caribou. Dall sheep most likely stay at higher elevations. Wolves probably migrate through looking for game. Roads in remote areas with little traffic often become travel corridors for the wildlife using the area (AP&Ts experience from other projects), which simply makes it easier for them to get around. However, the Yerrick Creek forest is primarily open, possibly reducing use of the road by wildlife. Although this project will remove habitat, the loss is not significant because the amount of land is small in comparison with the surrounding undeveloped area.

Dall sheep hunting is controlled by a drawing for a permit, only so many permits are allowed, so increased access should have little impact to this species because only so many can be legally harvested. Of the participating hunters, 94% were Alaska residents in regulatory years (RY) 2001-2003, of which 92% of the harvested rams were by Alaskans.[3]

For Macomb caribou, a permit is required as well with a harvest limit of one bull per year (only for residents). Only one Macomb caribou was harvested in Unit 12 in RY2001-2002 and RY2002-2003. Highway vehicle followed by horse are the dominant methods to hunt Macomb caribou in recent years.[4]

Brown bears are distributed throughout Unit 12. Unit 12 brown bear hunting regulations were liberalized in 1981 to reduce the bear population and elevate moose calf survival. "*In 1994, the Unit 12 brown bear management goal to reduce the brown bear population to increase moose calf survival was eliminated and the management goal was revised to provide for maximum opportunity to hunt brown bears in Unit 12. The management goal has remained the same since 1994*."[5] Presently, only one brown bear per permit per regulatory year is allowed to be harvested. During RY 04 & 05, non-residents of Alaska accounted for 65% and 75% of the harvest respectively. For black bear, three bears per permit per regulatory year can be harvested. Alaska residents accounted for 89-93% of the black bears harvested during RY98-RY00. Yerrick Creek does not contain a reliable source of fish in the project area (diversion to the powerhouse) to attract bears to feed. Other streams along the Tanana River have better runs of grayling and Dolly Varden as well as other salmonid species.

Regarding moose, "*Predation by wolves and grizzly bears has likely been the greatest source of mortality for moose in Unit 12 and has likely been the major factor keeping the population at a low density since the mid 1970s. In contrast to most other areas that contain sympatric moose, wolf, and grizzly bear populations, wolves, rather than bears, appeared to be the primary predator on moose calves on the Northway-Tetlin Flats, based on research conducted during the late 1980s (ADF&G, unpublished data; U.S. Fish and Wildlife Service, unpublished data). Wolf predation also appeared to be the greatest source of adult mortality. However, in some mountainous areas of Unit 12, fall composition data indicate that predation on moose neonates was high, suggesting grizzly bear predation*."[6] Hunters using 3 or 4 wheelers accounted for the highest percentage of the harvest with highway vehicles next. Predation by wolves and bears shows that other natural processes have a far greater impact on moose than humans. Only one bull can be harvested per year per permit.

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[3] Parker McNeill D.I. 2005. Portions of Units 12, 13C, and 20D Dall sheep management report. Pages 68-79 *in* C. Brown, editor. Dall sheep management report of survey and inventory activities 1 July 2001-30 June 2004. Alaska Department of Fish and Game. Project 6.0. Juneau, Alaska.

[4] DuBois, S. D. 2007. Units 12 and 20D caribou. Pages 65-82 *in* P. Harper, editor. Caribou management report of survey and inventory activities 1 July 2004-30 June 2006. Alaska Department of Fish and Game. Project 3.0. Juneau, Alaska, USA.

[5] Gross, J. A. 2007. Unit 12 brown bear. Pages 132-142 *in* P. Harper, editor. Brown bear management report of survey and inventory activities 1 July 2004-30 June 2006. Alaska Department of Fish and Game. Project 4.0. Juneau, Alaska, USA.

[6] Hollis, A. L. 2006. Unit 12 moose. Pages 126-143 *in* P. Harper, editor. Moose management report of survey and inventory actitivies 1 July 2003-30 June 2005. Alaska Department of Fish and Game. Project 1.0. Juneau, Alaska, USA.

Up to five wolves can be harvest per year in Game Management Unit 12.

Management of these species with state harvest limits is what controls the human take of these species. Putting a road into the Yerrick Creek drainage to reach the diversion site may provide easier access by hunters, but all these species require permits to harvest. The harvest total for the management unit is based on what the populations can tolerate. This short road into Yerrick Creek will not change management of these species, even if it makes it easier to get into this area.

Avian species are not expected to be significantly impacted due to the limited nature of the clearing needed (15 feet wide for access road / penstock route) although there could be some loss of habitat.

5.3.3 TES botanical survey

A threatened, endangered, and sensitive (TES) plant species survey was conducted within the Yerrick Creek Hydroelectric project area by a qualified botanist of HDR, Inc., Anchorage. The purpose of the study was to determine if there were any individuals or populations of plant species of interest that may be affected by project activities. The survey was conducted at Level 5 intensity.

Most of the project area is undeveloped with an open gravel waterway, islands of mixed hardwood and softwood trees, abandoned gravel side channels in various states of revegetation, and heavily forested banks. The main vegetation of Yerrick Creek study area is typically open paper birch – white spruce forest. Open balsam poplar–white spruce forest and open white spruce forest inhabits drier sites. Open black spruce forest and open dwarf black spruce forest occupy areas with poorly drained soils. Closed tall alder or willow scrub occupies the transitional areas between forested areas and creek channel. Narrow areas of gravel floodplain areas along Yerrick Creek are inhabited by early seral graminoids and forbs. Bluejoint meadows and lowland sedge wet meadows occupy wet areas adjacent to ponds.

The HDR project botanist surveyed most of the major vegetation types, and covered much of the geographic extent of the Yerrick Creek project area. The majority of collection locations were concentrated on gravel river bars and shrub areas adjacent to the Yerrick Creek. More than 100 vouchers were collected. Specimens were given provisional names in the field and later sorted, examined and identified by the HDR botanist. Specimens of notable taxa will be sent to the UAF Herbarium (ALA) for review by the museum staff. Most of these species are widespread in interior Alaska. No non-native species were observed in the Yerrick Creek study area.

In total, 145 species from 40 families were recorded at the area. The complete list of species encountered in Yerrick Creek study area is found in Appendix 9.3.2 – TES Plant Report. Two lakes were visited. Aquatic plants were observed and recorded from the shore. The study area was not surveyed for aquatic plants specifically.

Four notable plants were found in the project area. The AKNHP tracks populations of plants of interest. Notable plants are not considered rare, sensitive, or endangered but are considered to be of ecological interest by the AKNHP.

Phlox sibirica (Siberian phlox) was not previously reported from the area. The closest records of this plant are approximately (UAF 2008):

1. 30 miles NW of Yerrick Creek in Fort Greely Military Reservation in 2004 (63.78°, -145.79°)
2. 45 miles SE of Yerrick Creek at Wrangell-St. Elias National Park and Preserve (62.20266°, -142.123273°)

Other notable plants, for which there are no nearby records, include:

1. *Botrychium lunaria* (common moonwort)
2. *Platanthera obtusata* (blunt-leaved orchid)
3. *Astragalus robbinsii* ssp. *harringtonii* (Harold's milkvetch)

The TES plant survey found no globally or state ranked Rare or Sensitive species during the survey. No Endangered species were encountered or identified during the survey. The only plant federally listed or proposed by the U.S. Fish and Wildlife Service in Alaska is *Polystichum aleuticum* C. Christensen, which is endangered. It is only known from Adak Island and is not expected to occur in the proposed Project area. Most plant species observed in the area are considered common and widespread in interior Alaska.

5.4 Water Quality & Quantity

5.4.1 Water Quality

A water quality survey was conducted by Travis/Pederson Environmental Consulting, Inc., Fairbanks, using past (USGS 15476000) and present information to complete an analysis (report can be found in Appendix 9.3.3. – Literature Review and Field Report: Hydrology Baseline Study). The findings from the water quality study is that Yerrick Creek is a clear, oligotrophic (low nutrient levels) and well oxygenated stream. The moderately high pH for surface water suggests contact with some kind of carbonate rock within the drainage. High flushing flows occur on almost an annual basis, scouring and moving the cobble within the creek banks.

5.4.2 Water Quantity

AP&T's initial assessment of the water quantities in Yerrick Creek (Berkshire, 2007) were based on transposition of the record of the USGS gage on Berry Creek some 33 miles west of Yerrick Creek, with adjustment for the drainage areas of the two streams.

AP&T installed a stream gage on Yerrick Creek near the diversion site in June 2007. In July 2008, the gage installation was washed out by flooding. The gage was subsequently moved upstream a few hundred feet to a more protected location, but equipment malfunctions prevented collection of data until the spring of 2009. As with all stream gages in interior Alaska, the gage installation is subject to ice influence, and flows in the winter can only be estimated.

AP&T has attempted to correlate the small amount of data from the Yerrick Creek gage with contemporaneous data from USGS gages in the area. Unfortunately, there are no contemporaneous USGS gages with similar characteristics (basin size, elevation, annual precipitation); available USGS gages are as follows:

- Phelan Creek near Paxton - - 12.2 mi^2 drainage area, mostly glaciated.
- Goodpaster River near Big Delta - - 677 mi^2 drainage area, lower and flatter topography
- Yukon River near Eagle - - 113,500 mi^2 drainage area

Correlations between the data from AP&T's gage and that from the USGS gages are only fair, with correlation coefficients (R^2) between 0.79 and 0.85.

Based on the flow data collected to date and the correlations with the USGS gage data, it appears that Yerrick Creek has a higher base flow than might be expected. Even in the winter, AP&T has always found water flowing under the ice at the gage location. AP&T theorizes that this is because of the large amount of alluvium in the valley. AP&T will continue to measure Yerrick Creek flows to develop more reliable streamflow correlations.

In 2010, AP&T contracted for another review of the hydrology information for the site (Environ Corp., 2010). For that study, a double correlation was attempted between Berry Creek, the Yukon River, and Yerrick Creek. The study determines likely upper and lower limits for Yerrick Creek flows.

5.5 Floodplains/Wetlands

A wetlands jurisdictional determination was conducted by HDR, Inc. (Appendix 9.3.4 – Preliminary Jurisdictional Determination). Most of the proposed Project area is undeveloped, with an open gravel waterway, adjacent forests, abandoned gravel side channels in various states of re-vegetation, and heavily forested banks. The creek corridor is the only floodplain, and the project features that will be within the floodplain are the diversion structure and a small portion of the penstock. Besides the creek, there are small and large ponds on the ridges above the creek to the west as well as hydric soils and permafrost scattered about. A significant portion of the soils are not hydric and are well drained.

Conclusions from the wetland delineation were: at wetland data from locations, 15 out of the 28 sites had hydrophytic vegetation. The most common trees in the project area include white spruce (*Picea glauca*), balsam poplar (*Populus balsamifera*), and some paper birch (*Betula papyrifera*). The most common shrub is alder (*Alnus crispa*). Saplings of white spruce and cottonwood are also common in the shrub layer. Common graminoids include bluejoint reedgrass (*Calamagrostis canadensis*) and a variety of sedges (*Carex* spp.). Common forbs include timberberry (*Geocaulon lividum*) and dwarf fireweed (*Chamerion latifolium*). Mosses and lichens were found primarily in forested plots.

Wetland locations are based upon the dominance of hydrophytic vegetation, hydrologic indicators, and hydric soil indicators. Other waters of the U.S. are based on the investigators' judgement about the location of the ordinary high water mark of Yerrick Creek. Based on the findings above, approximately 21.3% (147.1 acres), a conservative delineation, of the mapped acres were determined to meet the USACOE requirements for being classified as wetlands or other waters. Most of the mapped wetland areas are not within the proposed project construction areas.

The remainder of the mapped project area, approximately 78.7% (542.6 acres) of the mapped area, lacks one or more of the required three parameters to support classifying an area as wetland and is not below the plane of the ordinary high water (OHW) mark of Yerrick Creek. These areas would not be subject to jurisdiction under Section 404 of the Clean Water Act.

Yerrick Creek and its adjacent active bars are waters of the U.S. below the creek's OHW mark. OHW is particularly difficult to define for a braided channel such as this one. There may be some areas within the river bars that are not actually below the OHW mark.

5.6 Environmental Justice

The communities that would benefit from the proposed Project are Tetlin (pop. 117; 94.9% is Native American), Tanacross (pop. 140; 88.6% is Native American), Dot Lake (pop. 19), and Tok (pop. 1,393; 12.8% is Native American), Alaska. The state's percentage of Native Americans is 13.4%. According to the U.S. Census data, the county median household income was $38,776, which is 75% of the State median household income of $51,571. The per capita income for these communities is: Tetlin $7,372; Tanacross $9,429; Tok $18,521; and Dot Lake $19,406 compared to the State at $33,761. Family poverty levels are higher in Tetlin (40%), Tanacross (22.6%), and Tok (9.5%) than the State as a whole (6.7%). Unemployment in Tanacross is 57.1%, Tetlin 46.9%, and in Tok 18%.[7] The Denali Commission's 2009 Report on Distressed Communities in Alaska lists Dot Lake, Tetlin and Tanacross as distressed. Tok was last listed as a distressed community by the Denali Commission in their 2008 report. Based on the current state of the U.S. economy, it is likely that all four communities will be listed in 2010. The Denali Commission list of Distressed Communities can be found in Appendix 9.4 – 2009 Denali Commission List of Distressed Communities.

5.7 Socioeconomics

The present (2009) electric rates for AP&T customers in Tetlin, Tok, Tanacross and Dot Lake (a small, isolated grid) is approximately $0.47 per kWh. AP&T's current diesel fuel consumption is approximately 350,000 gallons per year, which at today's prices (the 2008 average was $3.577 per gallon) costs $1,252,000 annually. Over 50 years, AP&T's diesel generation plant will use approximately 17,500,000 gallons of diesel. The existing diesel plant in Tok, which supplies electricity to all four communities, presently has six diesel generators to meet and act as backup for the load demand. The generators require significant labor and maintenance. The frequency of generator overhaul and replacement of these six units averages a cost of approximately $50,000 annually. These costs are passed on to customers via the electric rates.

Many customers in AP&T's service area supplement their electrical use with wood, kerosene, and oil or gas generators for heating because of the high cost of electricity. Several customers also use propane for cooking, clothes dryers, hot water heaters, etc. The economy along the Alaska Highway has suffered from high gas prices, the slowed national economy. This situation has impacted the local economy, which is reliant upon tourism for

[7] Based on the 2000 U.S. Census Records

its economic sustainability. As mentioned under Environmental Justice, Dot Lake, Tetlin, and Tanacross are on the 2009 Denali Commissions list of distressed communities, and have been so for years, with Tok last listed in 2008. The local school is seeking cheaper electric rates and is therefore looking at other technologies. A couple businesses have come through looking for sites to build manufacturing plants in the Tok area until they discovered how expensive the electricity is. Economic development is bleak for the area at this time.

6 ENVIRONMENTAL CONSEQUENCES

6.1 Alternative 1: No – Action

If No Action is taken, the environment at Yerrick Creek would remain unchanged. There would be no diverting of flow out of the creek to be returned further downstream, having no impact on the limited fish habitat available in this area of the creek and therefore allow free movement by fish as currently exists. There would be no loss of terrestrial habitat from the clearing of the right-of-way for the access road and penstock route. Wildlife that uses the area would not be stressed by the activity of construction, possibly temporarily forcing them out of the area. There would be no possibility of human induced erosion or sedimentation to the creek.

The No Action alternative would also mean the four communities that would benefit from this project will remain on diesel generation for their electrical needs. This will cause their electric rates to fluctuate with the price of diesel, which is expected to remain high keeping the area electric rates high. Diesel generation also puts particulate matter and gases such as CO_2 into the air, which are related to global warming. The high volume of diesel fuel needed for this small grid increases the likelihood of spills during transport and fueling operations as well as potential leaks from storage. The transport of hundreds of thousands of gallons of fuel each year relies on the burning of fossil fuels, which would continue. The high cost of electricity would continue to stress residential customers, schools, and businesses, suppressing economic and residential growth. The increasingly expensive electrical rates may drive people from these communities. This economically impacted area on the Alaska Highway will continue to struggle with increases in the cost of diesel fuel.

6.2 Alternative 2: The Proposed Project

6.2.1 Land Use

Fall hunting, subsistence activity, and trapping would likely be temporarily impacted during the construction phase because wildlife would probably stay away during construction activity. Although, as usually happens at this type of construction activity, based on AP&Ts experience, if construction clearings cross a wildlife corridor the wildlife will continue to use it but may change the time of day they cross the area of activity. During the operations phase, impacts to hunting, subsistence activity, and trappers would be minor due to personnel surveillance of the proposed Project site for operation and maintenance. Building the access road into the diversion site will make access easier for hunters, possibly changing the land use by increasing, at minimum, the foot traffic into the basin and increasing pressure on wildlife. However, wildlife hunted in this state management unit (Unit 12) is managed by permits, which limits the number harvested per permit. This protects the mammals so that they are not harvested beyond what their population can tolerate. Therefore, any easier access into this area should not increase pressure on wildlife because only a certain number can be taken. Other pressure from increased access is just the intrusion or disturbance potentially caused by more recreational foot traffic or ATVs if they are able to access the project access road. Though use of the

basin is likely to increase, this is not expected to be a significant impact as this is a remote part of Alaska, even being on the Alaska Highway.

Overall, use of the project area for recreational purposes is likely to increase due to easier access, but impacts are not expected to be significant. The use of both state and private land for this project would be mitigated by paying fees for the use of the land. A gate which locks just off the highway will help limit access by vehicle to prevent illegal dumping.

6.2.2 Cultural Resources and Historic Properties

On January 13, 2010, RUS submitted a finding of effects letter to consulting parties (i.e., Alaska SHPO, Tanacross, Inc., Native Village of Tanacross, Native Village of Tetlin, and the Village of Dot Lake). In that letter, RUS included its determination of eligibility of sites identified in the November 2009 survey for inclusion in the National Register of Historic Places, which included sites: TNX-156 (Tanacross quadrangle segment of the Haines-Fairbanks pipeline), TNX-074 (Yerrick Creek cabin), TNX-211 (Can Dump area), and TNX-212 (Construction camp site). On March 24, 2010, the Alaska SHPO indicated that it considers TNX-212 a historic property. The Alaska SHPO stated that it has no objections with the current design of the proposed Project (i.e., the access road avoiding site TNX-212). SHPO requested that the boundaries of the site be marked as an avoidance area for construction crews. The Alaska SHPO concurred with RUS's determination that monitoring at site TNX-212 would not be needed. To date, no letters from the other consulting parties have been received.

6.2.3 Biological Resources

No Threatened, Endangered, or Sensitive wildlife species are known to utilize the proposed Project area, although they may pass through it. Impacts would be temporary from construction activities causing wildlife to avoid the site during construction. No long term impacts are expected.

No Threatened, Endangered, or Sensitive plant species were found to inhabit the site; therefore, no impacts are anticipated.

Fish resources in the Project's bypass reach will be minimally impacted because the existing quality of the habitat is currently poor. Dolly Varden in the creek primarily use habitat above the proposed Project area, and the Arctic grayling primarily use habitat below the proposed Project's discharge point. There is no evidence that the Arctic grayling use the creek for spawning; but the species are opportunistic, they may enter the area to feed. The potential loss of the bypass reach as fish habitat during parts of the year when flow is low is not significant for the sustainability of these two species due to better habitat in other nearby streams in the Tanana River basin.

ADF&G issued a permit on August 5, 2009, allowing the construction of this Project; however, they do request to see the intake and spillway designs prior to construction. As requested by ADF&G, AP&T plans to remain 66 feet away from the riparian corridor as much as practicable to reduce impacts of sedimentation into the creek. AP&T also

proposes to implement erosion and sedimentation control methods to reduce this potential to a level of non-significance. AP&T also proposes to bury the penstock to prevent a barrier to wildlife passage through the project and to place the penstock within the access road corridor as much as possible to minimize vegetation clearing. ADF&G has indicated they agree with both these approaches. ADF&G requested in the habitat permit that an "*excess flow bypass shall be constructed as a roughened channel that permits all flow in excess of 60 cfs to remain in the middle bypass reach and that provides fish passage, both upstream and downstream*." This creek is not considered Essential Fish Habitat.

With the proposals made by AP&T, which are approved by ADF&G, this Project is not expected to have significant impacts to Biological Resources.

6.2.4 Water Quality & Quantity

Based on the water quality studies conducted, there are no chemical abnormalities that would warrant further investigation of the stream to be impacted by the hydroelectric project. With the erosion and sedimentation control methods AP&T proposes to employ (i.e. silt fencing, jut netting, seed mix using annual non-invasive species, using as narrow a corridor as possible, and use of riprap to stabilize slopes along with revegetation as needed) during and after construction of the proposed Project, water quality should be only minimally impacted as these methods will significantly reduce the opportunity for sedimentation. Construction within the creek will use cofferdams to divert flow around construction activity to minimize sedimentation. Cofferdams will likely be made from super-sacks[8] filled with sand. Therefore, the proposed Project should have no significant impacts to water quality.

6.2.5 Floodplains/Wetlands

The project will impact a floodplain (creek) by installing a diversion structure across the creek, which will remove flow of up to 60 cfs. This floodplain, or creek, is an open gravel waterway with abandoned gravel side channels in various states of re-vegetation with heavily forested and steep banks. Construction of the diversion and removal of up to 60 cfs would remove most water flow between the diversion and the Project's tailrace; however, this would have minimal environmental impacts to this floodplain due to a lack of vegetation and poor fish habitat to support. Based on the flow data collected to date and in correlation with other nearby gaged streams, during a typical year flows greater than 60 cfs will occur only in early summer (June and July). During times of high flow, water will flow over the diversion structure and continue down the creek. The duration of this spill flow will be intermittent, and will vary with the amount of snow accumulated in the basin. During low runoff years, there may be only a very short period of spill, but during high runoff years the spill period may start in June and extend through August.

The Yerrick Creek channel routinely experiences peak flows over 1000 cfs (based on regional parameters, the two-year flood is estimated at 1,102 cfs and the five-year flood is estimated at 1,575 cfs). This Project will reduce flood flows below the diversion structure, however, the 60 cfs reduction is not considered significant compared to the high peak flows. The diversion structure will be constructed with a relatively flat upstream concrete

[8] Large nylon-fabric sacks (very strong) meant to perform like conventional sandbags, only larger.

face (4H:1V) to allow movement of bedload and sediment downstream during floods. Nevertheless, accumulation of sediment in the diversion pond is expected, and will require periodic removal and placement in the downstream floodplain to maintain the existing sediment movement regime. There will be minimal impacts to the Yerrick Creek floodplain caused by Project construction or operation because high flows that exceed 60 cfs occur annually.

Outside of the creek floodplain, there will be few if any impacts to wetlands because the Project utilizes uplands, thereby avoiding impacting wetlands along the access road/penstock route. The wetland survey conducted found that there were approximately 21% wetlands within the project boundary (including hydric soils), though not necessarily where the project features will be located. In fact, the final design specifically avoids wetlands along the access road/penstock route until meeting the creek where it is spanned by a single-lane bridge. AP&T proposes to mitigate potential impacts to wetlands by using silt fencing to prevent runoff from disturbed soils and revegetation with grass seed mixes, which will help stabilize disturbed soils. AP&T also proposes to confine construction activity to as narrow a footprint as possible, which will also reduce impacts.

6.2.6 Environmental Justice

This project would not disproportionately affect low income or minority communities in the proposed Project area. This Project, however, will improve conditions for these small communities by saving the customers money and potentially attracting industry or other commercial endeavors, which would provide employment to the area. Part of the Project is located on the Tribal Corporation, Tanacross, Inc., lands that AP&T will pay compensatory fees to use.

6.2.7 Socioeconomics

The proposed Project would provide rate stabilization and lower rates, which may attract more residents and commercial operations to any and all the communities this Project would serve. This Project may have a byproduct of providing more local employment in this economically distressed area. Having stabile rates could impact demographics as mentioned above and if the economy continues to decline, there will still be a need for less expensive and clean power. This project will reduce the noise and air pollution associated with diesel generation facilities which are located within city limits and will increase public safety by reducing the use of diesel fuel. This project will partially displace the use of diesel and diesel fuel sellers by reducing the amount AP&T purchases.

7 MITAGATION AND PERMITS

Mitigation measures that would be implemented in the construction and operation of the proposed Project include:

General

- Diversion should have an excess flow bypass when flows exceed the hydraulic capacity of the project (60 cfs) as a roughened channel to provide fish passage in both directions.
- Fish exclusion configuration at intake to prevent their injury or mortality; screen openings would not exceed ¼ inch.
- The access road and penstock will remain a minimum of 66 feet from the riparian zone along the creek except where access is needed to the diversion structure, the bridge crossing, and powerhouse, or unless otherwise necessary.
- The penstock will be buried as much as possible to allow wildlife passage.
- Project clearing will be kept to a minimum to reduce potential impacts to wildlife.
- The boundaries of site TNX-212 will be marked as recommended by SHPO. Construction crews will be notified of this avoidance area.
- Silt fencing will be used to contain runoff and prevent sedimentation.
- Grass seed mix, jut netting, and/or riprap will be used to stabilize disturbed soils after construction activity has ceased in an area.

ADF&G issued a habitat permit for construction on August 5, 2009, with the following stipulations that AP&T would implement:

- Prior to construction, civil plans for construction of the impoundment dam and excess flow bypass shall be submitted to ADF&G for review and approval.
- The excess flow bypass shall be constructed as a roughened channel that permits all flow in excess of 60 cfs to remain in the middle bypass reach and that provides fish passage, both upstream and downstream.
- Prior to construction, plans shall be submitted to provide for fish exclusion at the penstock intake. These plans must provide for an effective screen opening that does not exceed ¼ inch.

USACOE issued a Department of Army (DA) permit for construction on April 30, 2010, [POA-2009-445] with the following stipulations that AP&T would implement:

- All fill slopes and disturbed areas subject to erosion and siltation of Yerrick Creek or project area wetlands shall be stabilized against erosion by revegetation either by seeding and/or transplanting species native to the immediate area. Erosion control with materials such as coir logs, straw wattles, silt fencing, fiber biodegradable mats, straw mulch etc. must be used as best management practices.
- Migratory birds, their nests, eggs, nestlings, etc. will not be taken (disturbed in any manner). Vegetation must not be cleared between 5 May and 25 July of any year, unless the area to be cleared has been surveyed for birds and their nests, by a qualified biologist, and the land clearing or human disturbances can be conducted without a take.

- Yerrick Creek bed and banks disturbed by construction of temporary diversion channels, cofferdams, bridges, or other disturbances must be restored to original conditions upon removal of the temporary fills or structures.
- No equipment or machinery shall be refueled, lubricated, or maintained while in any active or inactive channels of Yerrick Creek. All debris will be cleaned from work areas authorized by this permit immediately following construction.
- Earthen materials shall not be stockpiled adjacent to Yerrick Creek to prevent erosion and siltation of creek waters.
- Trenching of Yerrick Creek for installation of the penstock crossing shall not occur within any flowing or open waters. The diversion must result in a dry work area. The creek bed must be restored with the large cobble rocks existing in the channel for armor protections prior to diverting the creek waters back to the original channel over the buried penstock. The creek bed and banks shall have the original elevation and contours re-established.
- Reasonable precautions and controls must be used to prevent incidental and accidental discharge of petroleum products or other hazardous substances into any water or wetland areas. Clean-up materials shall be available on-site and used immediately to contain any spills of such pollutants. Fuel storage and handling must not be conducted in Yerrick Creek or wetland areas. Equipment leaking fuel, oil, hydraulic oil, etc. must not be operated in aquatic areas and be repaired prior to use in or near Yerrick Creek.
- As compensatory mitigation for the permanent net loss of approximately 0.8 acre of Yerrick Creek area, the permittee shall pay an in-lieu fee to The Conservation Fund, or other Corps' In-lieu Fee Program sponsor, prior to initiating construction in waters of the U.S., at the ratio of 1 acre of creek to 1.5 acre preserved. The Conservation Fund will provide the cost per debit to the permittee at the time of payment. Proof of the in-lieu fee payment shall be provided to the Corps prior to beginning construction in the waters of Yerrick Creek.

The issuance of following permits are pending:

- DNR Land Use Permit
- DNR Water Rights Permit

AP&T is committed to implementing all environmental stipulations associated with the issuance of these permits.

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9 APPENDICES

9.1 Agency Correspondence

9.2 Hydrology Studies

ENVIRON

May 26, 2010

Mr. Larry Coupe, PE
Alaska Power & Telephone
Attn: Larry Coupe, PE
193 Otto Street
Port Townsend, WA 98368

Re: Yerrick Creek - Review of Available Data and Recommended Flow Duration Curve

Dear Larry:

The AP&T stream gage on Yerrick Creek has been collecting data since June 2007. The data record is not only short, but the gage was relocated several times; and its new location is subject to ice corruption, which can affect the data collected. In order to develop daily flow time series and duration curves, at least twenty years of average daily flow data are needed. This analysis can be conducted on a stream with a long flow record, if: (a) its flows are correlated with Yerrick Creek flows, and (b) its watershed is hydrologically similar to the Yerrick Creek watershed. Specifically, the watershed should have a similar drainage area (30 square miles), mean annual precipitation (MAP) (18 inches), mean elevation (2,000 feet), and should not be glaciated.

A search of the US (USGS and its partners) and Canadian hydrologic data found only two hydrologically similar watersheds: (a) Berry Creek watershed, thirty miles northwest of Yerrick Creek, with USGS gage 15476300 near Dot Lake, recording between 1971 and 1981; and (b) the Boulder Creek watershed, more than 100 miles north-northwest of the site, with USGS gage 15439800, and a data record from 1966 to 1986. The watershed above Berry Creek gage was measured at 65.1 square miles, and had average MAP of 18 inches. The gage was located at 1,400 feet, Both Berry Creek and Yerrick Creek watersheds drain a mountain-type watershed, with highest drainage peaks exceeding 6,000 feet. The Boulder Creek watershed drains a drainage area with elevations up to 3,000 feet, and has an average MAP of 16 inches. Flow measurements were distorted by ice between October and April of every year recordings made over the 20 year period. The Berry Creek flow data was used by a previous consultant (Berkshire 2007) to reconstruct representative Yerrick Creek flows; however, the Berkshire study was conducted in 2007, and they had no access to Yerrick Creek flow data.

After further analysis, it was decided to use the Berry Creek gage data, in order to develop its correlation with the existing Yerrick gage data. This was conducted in two steps:

(1) As the Berry Creek and Yerrick Creek data cover different time periods, the Berry Creek gage data was first correlated to the Yukon River flows at Eagle (USGS gage 15356000). This Yukon River gage has a continuous flow record for 38-years. Although the Yukon River is a much larger stream than Berry Creek, and drains a significantly larger watershed (113,500 square miles), it was the only stream in the region where flows were continuously recorded from 1971, and for which flows also have a fair correlation (coefficient of determination R^2 was 0.48) with Berry Creek flows. The Berry Creek flows were then extended through 2009 using the Berry Creek-Yukon River correlation.

(2) Berry Creek flows developed in step (1) were correlated with the recorded Yerrick Creek flows recorded at the AP&T gage (2007-2009). Then, the Yerrick Creek 38-years flow series was constructed using the Yerrick-Berry Creek flow correlation.

The correlation between Yerrick Creek and Berry Creek flow data is presented in Figure 1 below. The coefficient of determination (R^2) was 0.7856. The best fit curve is shown in black color; while the boundary line approximating outliers is shown in purple color.

The Yerrick Creek flow duration curve (Figure 2) was developed using 38-years of reconstructed Yerrick Creek data. The flow duration curve using the developed correlation equation is shown in blue color. The flow duration curve of the boundary line approximating outliers is shown in red color. The flow duration curve using recorded Berry Creek data developed by Berkshire is also shown (in black color) for comparison. The Berkshire Berry Creek flow duration curve lies midway between the Yerrick Creek main duration curve and the Yerrick Creek low prediction envelope, except for very low flows (below 10 cfs) and high flows (exceeding 70 cfs).

Conclusion:

With collection of more data at the Yerrick Creek gage, the flow duration curve may tend to adjust to the lower prediction limit flow duration curve (shown in red color in Figure 2). However, this adjustment may be limited to medium range flows (10 cfs – 30 cfs). It is unlikely that the curve will be adjusted towards lower flows that were recorded at the Berry Creek USGS gage 15476300 near Dot Lake. The reason is that the AP&T gage is located in a wide shallow section of a stream that is susceptible to ice during the period of low flows in Yerrick Creek. Formation of this ice prevents correct recording of low flows at the Yerrick Creek gage. It also appears that the ice (“frazil ice”) is corrupting data collection in the weeks leading up to the complete freeze, as pointed out by Berkshire in his report (2007). The Berry Creek USGS gage is located at a narrower section of the creek, and is able to capture longer periods of low flows (http://waterdata.usgs.gov/nwis/measurements?site_no=15476300&agency_cd=USGS&format=html_table_expanded).

Figure 1

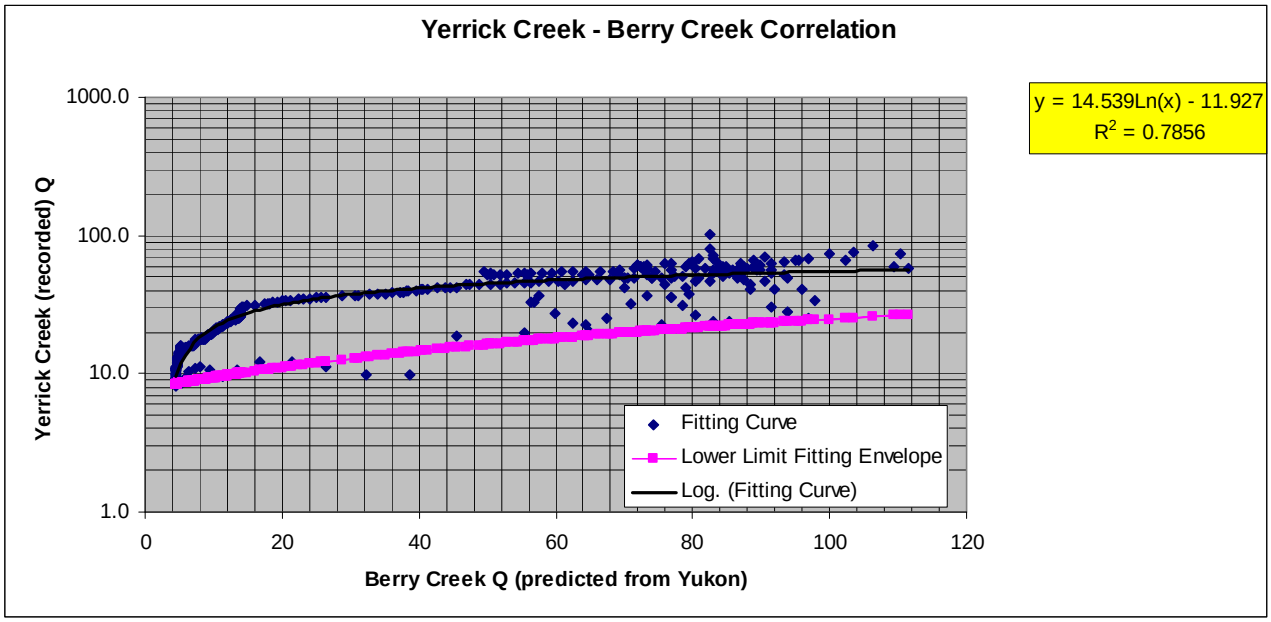
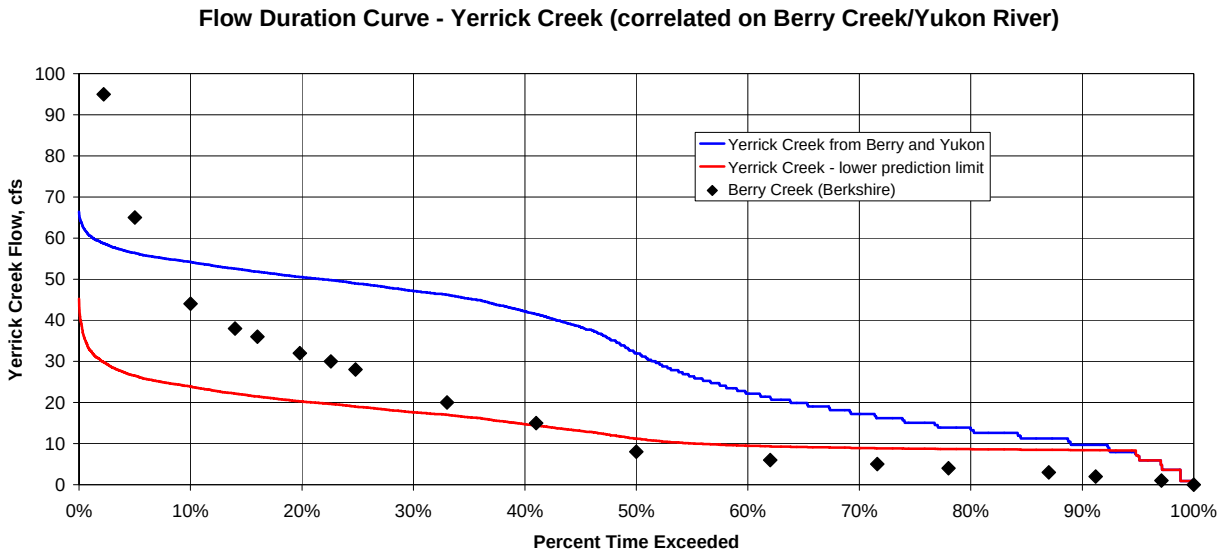


Figure 2



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Yerrick Creek Hydroelectric Project

Estimate of Average Annual Energy

July 2007

Prepared for:

Alaska Power & Telephone

by:

Paul A. Berkshire, P.E.

Executive Summary

Alaska Power & Telephone (AP&T) is in the early evaluation stages of a potential small hydroelectric project on Yerrick Creek located near Dot Lake, Alaska. Renewable energy from this project would offset current diesel generation in nearby Tok. This report provides an initial investigation into the energy potential of the proposed site.

Three project sizes ranging from 1.6-2.3 MW size were evaluated. The potential energy ranges from 4,600-5,100 MWh depending upon the capacity selected. Harsh winter conditions will likely limit generation to the months of May – October.

The data used to generate these estimates is not site specific. Additional data and analysis using site specific data should be performed when the information becomes available.

Project Overview

The Yerrick Creek project is a proposed small hydroelectric facility located approximately 20 miles west of Tok, in South Central Alaska. As initially configured by AP&T, the proposed project will have a small diversion located at approximately elevation 2,350. Up to 60 cfs of water will be conveyed to the powerhouse through approximately 11,000 feet of 36-inch diameter penstock. The powerhouse will be located at approximately elevation 1,750 and will house a single impulse type of turbine/generator set with a rated capacity of 1.5MW. The project is proposed to run in a "run-of-river" mode of operation.

Hydrology

General

Yerrick Creek originates in the foothills of the Alaskan Range at approximately elevation 6,000 and flows northward terminating in the Tanana River at about elevation 1,700. The drainage basin has been estimated by others[1] at 30 mi^2.

Ideally, a historical record of stream flow of 30 years or more is desirable to analyze a stream of interest. However, long-term stream flow records are seldom available for small hydroelectric projects as is the case for Yerrick Creek. In situations where long-term data is not available, the surrounding area is reviewed for USGS and other stream flow gages with adequate periods of record, and similar geologic and hydrologic conditions. These other records are then adjusted to reflect local conditions.

Available Data

Site Specific Data

AP&T has installed a gage at the proposed diversion site and has initiated a program to record flow history. At this time, data from this site is extremely limited and unverified. However, gage calibration data and photos help define the characteristics of the creek. As shown in Figures 1 and 2 below, Yerrick Creek runs relatively wide and shallow in the range of proposed project flows.

[1] Alaska Power & Telephone, Petition for Declaratory Order-FERC, January 2007

USGS Stream Gaging Records

USGS gage #15476300, with a drainage area of 65.1 mi^2, is located at elevation 1,400 on Berry Creek near Dot Lake, AK. The location of this gage is approximately 30 miles northwest of the project site and the drainage basin has the same general orientation as the Yerrick Creek drainage. Gage #15476300 has a 10-year continuous period of daily flow recordings from WY1972-1981. As defined by USGS, this gage has a "Fair" rating which indicates that 95% of the daily recordings are within 15% of the true value.

USGS gage #15476000, with a drainage are of 8,550 mi^2, is located at elevation 1,489.58 on the Tanana River near Tanacross, AK. The location of this gage is within 5 miles of the termination of Yerrick Creek. Gage #15476000 has a 35-year continuous period of daily flow recordings from WY 1955-1990.

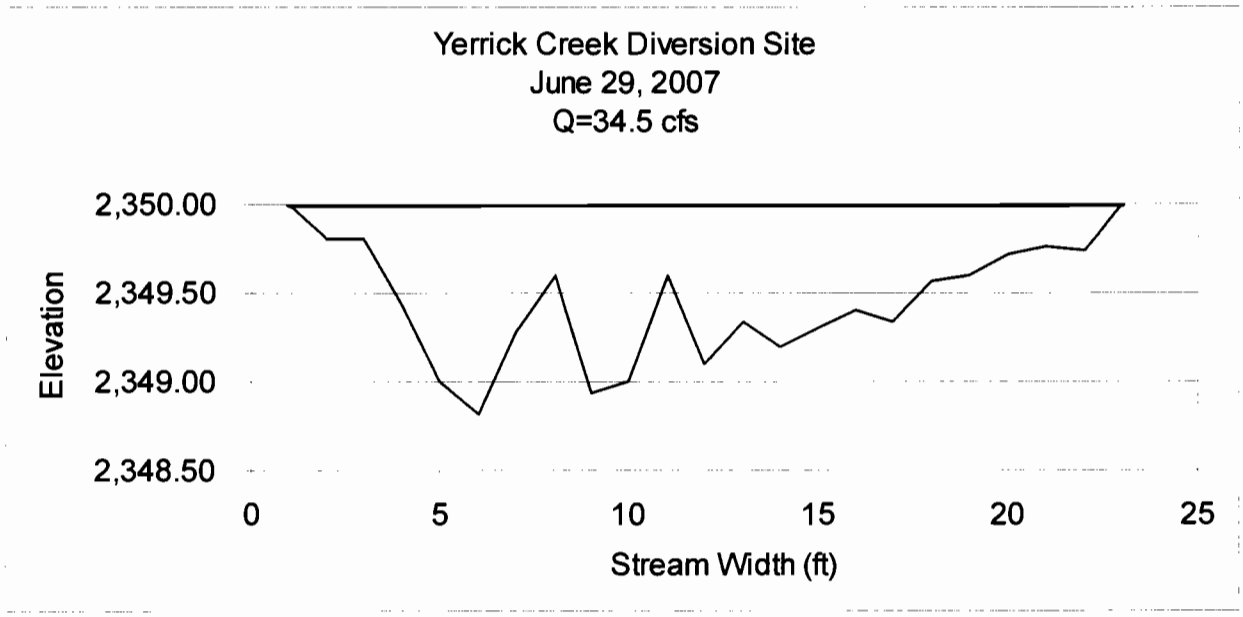

Figure 1

Analysis

Daily stream flow records were obtained from the USGS for gage #15476300 as well as average annual flows for gage #15476000. These two gages have an overlapping period of record from WY 1972-1981. Gage #15476000 has a long-term (35-yr) annual average flow of 8,108 cfs. For the period WY 1972-1981 the average annual flow for this gage was 8,083, or 99.7% of the long-term annual average. This indicates that the period WY 1972-1981 represents likely average flow conditions.

Gage #15476300 was used to develop a simulated flow record for Yerrick Creek. Standard methods for correlating drainage basins include corrections for differences in drainage area, elevation and precipitation. A Yerrick Creek flow record was developed by linearly scaling the data from gage 15476300. In this case, precipitation records for either location are unavailable and the general elevations of the two basins are similar. As such, no corrections were made for either elevation or relative precipitation. Average monthly flows and a flow duration curve based upon the simulated data for Yerrick Creek are presented in Figures 3 and 4 below.

Figure 2

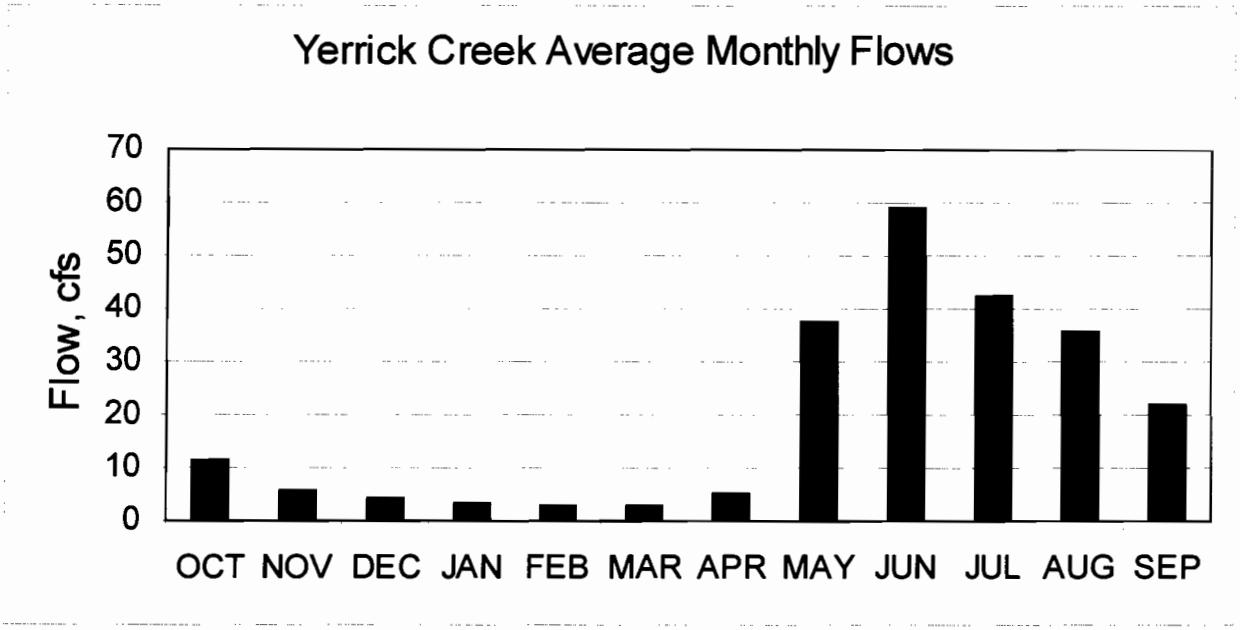

Figure 3

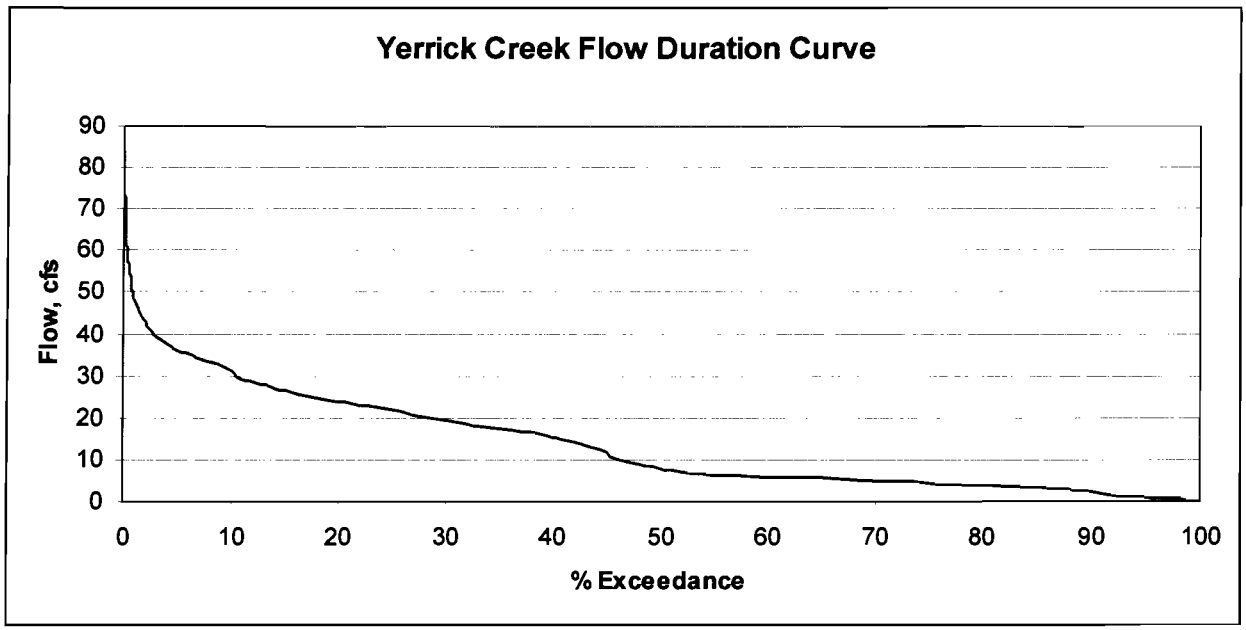

Figure 4

Observations

This analysis relies on the assumption that the Berry Creek drainage is similar to that of the Yerrick Creek drainage. This assumption needs to be verified in the field.

Figure 5 below presents the average monthly temperature for Tok, AK for a period of record from 6/11/1954 to 12/31/2006. This figure indicates that on average the region enters into a sub-freezing period sometime in late October and stays below freezing until early April. This pattern is representative of northern Alaska. A visual inspection of the individual data points in the flow record for gage #15476300 during the winter months reveals extended periods of constant flow. This is often indicative of the level sensor freezing in one position. This data and the fact that Yerrick Creek flows wide and shallow raises questions about whether or not any flow would be available for hydroelectric generation during the months of November-March.

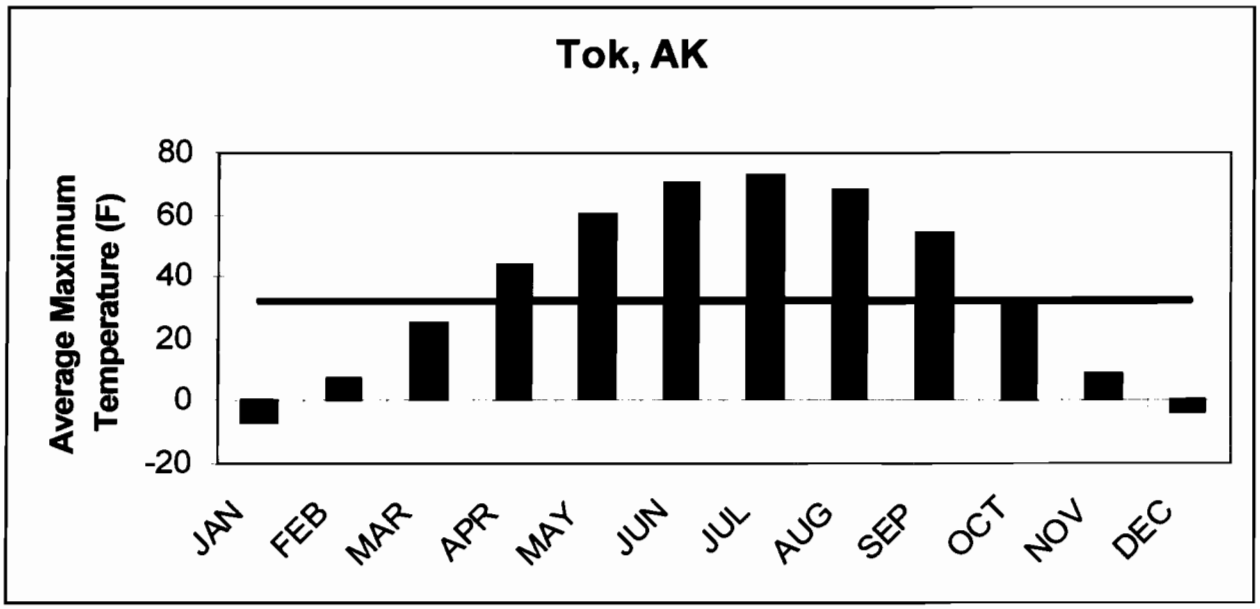

Figure 5

Another consideration that will likely affect project operations is the formation of frazil ice in the water column in the days and weeks leading up to a complete freeze. The wide, shallow flow combined with the lack of any significant reservoir storage and extreme low temperatures make this site a prime candidate for frazil ice problems. The evaluation of frazil ice is beyond the scope of this report but should be considered as part of final project design.

Energy Production

Project Configuration

The project as defined above equates to an overall water-to-wire efficiency of 54%. Modern day generating equipment operates at significantly higher efficiencies. As such, it is highly likely that further engineering will indicate that the optimal project will have either, or a combination of, lower project flows and increased installed capacity. A detailed optimization is beyond the scope of this report. However this report does evaluate three simplified energy generation scenarios.

Equipment Selection

At 600' feet of gross head, the project falls within what is generally referred to as the transition zone between reaction-type (Francis) and impulse-type (Pelton) turbines. For this analysis, a Turgo-type (hybrid) of turbine was selected. This type of turbine operates efficiently over a wide range of flows and offers reduced construction costs. Further analysis may indicate that a different type of turbine is warranted. A standard synchronous generator was assumed. Equipment efficiencies were obtained from actual manufacturer's data from other similar projects.

Penstock Sizing

For all scenarios, a 36-inch diameter steel penstock was assumed. This diameter is most representative of a design flow of 60 cfs. Design flows less than 60 cfs may justify a smaller penstock diameter.

Reservoir Capacity

This project is assumed to have no significant reservoir capacity.

Minimum Instream Flow

There have been no reductions is the projected project hydrology to account for minimum instream flows in the bypass reach to maintain aquatic habitat.

Analysis

To estimate the projected average annual generation for the proposed project, a daily energy simulation model was created using the simulated hydrologic flow record developed above. For each day of record, the model determines the appropriate net head and equipment efficiency. These values are then used to determine the average capacity for the day. This process is repeated for each day in the period of record.

Generalized deductions were made for station service, transformer, transmission and downtime losses. In total, these losses were estimated to be 3%.

Results

Table 1 below presents the results of the evaluation of 3 possible scenarios. The Potential Average Annual Energy column represents the results from using the hypothetical hydrology files. The Probable Average Annual Energy column represents project operations only during the months of May-October.

Table 1

Design Flow, cfs	Installed Capacity, MW	Potential Average Annual Energy, MWh	Probable Average Annual Energy, MWh
60	2.3	5,360	5,100
50	2.0	5,320	4,920
40	1.6	5,100	4,640

Yerrick Creek, AK - Simulated Flow Data
July 2007

AVERAGE MONTHLY FLOW DATA

YEAR	AVG	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1972	21.6	12.7	7.4	6.6	4.6	2.3	1.0	1.0	64.3	60.6	51.3	29.9	15.9
1973	21.0	6.5	3.5	3.0	2.0	2.0	2.0	3.5	43.0	96.1	38.7	33.7	16.9
1974	17.4	6.4	2.0	.4	.0	.0	.0	.8	39.5	56.0	40.0	37.5	24.8
1975	30.1	10.1	6.7	4.6	1.3	1.0	1.0	2.5	63.1	100.0	64.8	67.0	37.5
1976	20.0	14.3	6.7	5.7	5.0	5.0	5.0	6.6	25.1	70.1	35.3	41.3	20.2
1977	20.2	8.5	4.2	4.0	3.0	3.0	3.0	5.1	37.8	72.8	43.7	30.4	26.4
1978	17.7	18.8	6.8	6.0	6.0	5.0	5.0	8.3	37.4	35.4	38.0	28.9	15.9
1979	16.2	8.4	4.5	4.0	3.3	3.0	3.7	9.2	28.7	32.6	35.8	36.8	22.7
1980	12.8	11.6	5.4	4.0	3.0	3.0	3.7	7.3	14.9	23.3	33.3	21.6	22.3
1981	17.2	16.6	7.5	6.0	5.1	4.7	5.1	6.7	20.8	43.7	41.5	29.4	17.9
AVERAGE	19.4	11.4	5.5	4.4	3.3	2.9	3.0	5.1	37.5	59.1	42.2	35.7	22.0

FLOW DURATION CURVE DATA

CLASS	FLOW	TOTAL	ACCUM	PERCT
0	0	118	3653	100.00
1	1	200	3535	96.77
2	2	149	3335	91.29
3	3	335	3186	87.22
4	4	234	2851	78.05
5	5	348	2617	71.64
6	6	338	2269	62.11
7	7	116	1931	52.86
8	8	63	1815	49.69
9	9	56	1752	47.96
10	10	38	1696	46.43
11	11	24	1658	45.39
12	12	45	1634	44.73
13	13	36	1589	43.50
14	14	58	1553	42.51
15	15	52	1495	40.93
16	16	119	1443	39.50
17	18	111	1324	36.24
18	20	67	1213	33.21
19	22	86	1146	31.37
20	24	77	1060	29.02
21	26	79	983	26.91
22	28	78	904	24.75
23	30	102	826	22.61
24	32	69	724	19.82
25	34	69	655	17.93
26	36	72	586	16.04
27	38	36	514	14.07
28	40	62	478	13.09
29	42	32	416	11.39
30	44	18	384	10.51
31	46	25	366	10.02
32	48	21	341	9.33
33	50	57	320	8.76
34	55	22	263	7.20

35	60	61	241	6.60
36	65	21	180	4.93
37	70	15	159	4.35
38	75	22	144	3.94
39	80	18	122	3.34
40	85	11	104	2.85
41	90	13	93	2.55
42	95	4	80	2.19
43	100	9	76	2.08
44	105	8	67	1.83
45	110	6	59	1.62
46	115	8	53	1.45
47	120	8	45	1.23
48	125	3	37	1.01
49	130	2	34	.93
50	135	6	32	.88
51	140	1	26	.71
52	145	0	25	.68
53	150	1	25	.68
54	155	2	24	.66
55	160	2	22	.60
56	165	1	20	.55
57	170	3	19	.52
58	175	3	16	.44
59	180	3	13	.36
60	185	0	10	.27
61	190	1	10	.27
62	195	0	9	.25
63	200	2	9	.25
64	210	0	7	.19
65	220	0	7	.19
66	230	1	7	.19
67	240	1	6	.16
68	250	0	5	.14
69	260	0	5	.14
70	270	1	5	.14
71	280	0	4	.11
72	290	0	4	.11
73	300	1	4	.11
74	310	0	3	.08
75	320	0	3	.08
76	330	0	3	.08
77	340	0	3	.08
78	350	0	3	.08
79	360	1	3	.08
80	370	0	2	.05
81	380	1	2	.05
82	390	0	1	.03
83	400	0	1	.03
84	410	1	1	.03

YERRICK CREEK ESTIMATED POWER GENERATION

DATA FILE USED: YERRICK.QCH

MODEL DESCRIPTION

PIPE #	LENGTH	DIAMETER	MANNING'S n	MINOR LOSSES
1	11000	36	.01	2

HEADWATER ELEV: 2350
TAILWATER ELEV: 1750
GROSS HEAD: 600
DESIGN FLOW: 50
NET HEAD @ FULL LOAD: 562.1
NAMEPLATE CAPACITY (kW): 1999.4 @ 1 POWER FACTOR

STATION SERVICE LOSS: .5
TRANSFORMER LOSS: .5
TRANSMISSION LOSS: 1
SCHEDULED DOWN TIME: 1

TURBINE SELECTED: 1 - TURGO-GENERAL
GENERATOR SELECTED: GE

MINIMUM INSTREAM FLOWS

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
0	0	0	0	0	0	0	0	0	0	0	0

SIMULATED PRODUCTION IN MEGAWATT-HOURS

YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1972	363.4	181.6	163.3	66.8	0.0	0.0	0.0	838.1	1181.7	1203.7	890.3	452.8	5341.6
1973	165.2	0.0	0.0	0.0	0.0	0.0	23.7	1077.5	1344.4	1095.6	973.3	484.6	5164.2
1974	132.9	0.0	0.0	0.0	0.0	0.0	0.0	841.1	1240.3	1125.3	1042.2	703.8	5085.7
1975	278.1	160.7	85.7	0.0	0.0	0.0	38.4	935.4	1367.1	1296.3	1413.2	1036.4	6611.5
1976	414.1	162.8	138.6	119.1	111.4	119.1	164.0	744.5	1224.4	1043.1	1086.3	583.3	5910.8
1977	228.5	19.2	0.0	0.0	0.0	0.0	71.5	795.9	1308.0	1189.4	909.6	764.9	5286.9
1978	556.0	164.4	146.6	146.6	107.6	119.1	213.7	938.3	993.0	1030.1	866.9	453.7	5736.2
1979	225.3	57.6	0.0	0.0	0.0	37.2	239.4	749.5	912.8	1008.8	910.8	658.3	4799.7
1980	329.0	126.0	0.0	0.0	0.0	20.1	179.9	437.7	604.7	931.3	647.6	645.2	3921.5
1981	489.7	187.7	146.6	122.7	76.9	83.4	163.6	610.9	974.4	1155.1	847.6	513.6	5372.0
AVERAGE	318.2	106.0	68.1	45.5	29.6	37.9	109.4	796.9	1115.1	1107.9	958.8	629.7	5323.0

AVERAGE PLANT FACTOR: 0.30
AVG. # DAYS/YEAR SHUTDOWN DUE TO LOW WATER: 103

THIS SIMULATION USED THE FOLLOWING EQUIPMENT EFFICIENCIES

% LOAD	TURBINE	GENERATOR	COMBINED
0	0.0	0.0	0.0
10	70.1	92.8	65.0
20	79.4	94.9	75.4
30	83.7	96.3	80.6

40	84.9	97.0	82.3
50	85.9	97.3	83.5
60	86.0	97.5	83.9
70	86.0	97.7	84.0
80	86.0	97.7	84.0
90	86.0	97.7	84.1
100	86.0	97.7	84.0

9.3 Biological and Other Surveys

9.3.1. Fish Resources Report

9.3.2. Threatened, Endangered, Sensitive (TES) Plant Report

9.3.3. Literature Review and Field Report: Hydrology Baseline Study

9.3.4. Preliminary Jurisdictional Determination

9.3.5. Heritage Resource Survey

9.3.1. – FISH RESOURCES REPORT

10 June 2009

To: APT – Glen Martin

From: GRAYSTAR – Steve Grabacki

Subject: Report of Fisheries Fieldwork, Yerrick Creek, May-June 2009

I conducted three sampling sessions on Yerrick Creek -- 19-20 May 2009, 27-29 May 2009, and 7 June 2009.

For the first two sessions, the study area included lower Yerrick Creek, from roughly ½-mile above the proposed powerhouse site downstream to the Tanana River. The main purpose of the sampling was to compare spawning aggregations of Arctic grayling above vs. below the proposed powerhouse site. Sampling methods included visual observation with polarized lenses, angling with spin and fly terminal tackle, underwater video, and 3 styles of fish traps (small wire-mesh minnow traps, medium collapsible minnow traps with larger throat, and larger collapsible traps) baited with commercially cured salmon roe.

On the third sampling session, we focused on the creek downstream of the highway. The purpose of this sampling was to observe and capture Arctic grayling in lower Yerrick Creek, and to compare grayling's use of the creek for spring spawning by adults vs. summer feeding by juveniles. Sampling methods included visual observation with polarized lenses, angling with spin and fly terminal tackle, and herding fish through pools into a bag seine.

General Habitat Description

For most of its length, Yerrick Creek is a cascading stream with fast flow and boulder substrate. The stream generally comprises 1-3 channels, within a wide dynamic (scoured) perimeter. Apparent fish habitat consists of widely spaced, very small (~10-foot long) pools behind large boulders or logjams.

Roughly 1 mile before the creek joins the Tanana River, the habitat is significantly different. Flow is much slower, and the habitat is composed mostly of sand. In this "delta" area, there are 3 main channels, several smaller channels which leave and rejoin the larger channels, and at least one large area ("city block" in size) through which the creek flows more-or-less overland, in very shallow channels among dense spruce trees.

In between these two reaches is a transition zone, where flow is intermediate in strength and substrate is small rocks & large gravel. This transition zone is only a few hundred yards long.

Complicating this situation is the fact that the water flowing in the creek is not always continuous with the river. Because of the porous substrate, the water sometimes disappears from the surface, and flows underground.

First Sampling Session

During the field trip of 19-20 May 2009, Yerrick Creek did not flow into (connect to) the Tanana River. Water flow appeared strongest at the uppermost sampling station (above the powerhouse site), and water was flowing in only 1 channel under the highway bridge.

On 19 May, the water disappeared approximately ¾-mile downstream of the bridge, within the rocky streambed. On 20 May, the water had reached about 0.9 miles farther downstream, but disappeared in the sandy substrate. In the sandy delta area, there were a few very small pools with very little flow, and mostly dry substrate.
At the bridge, water temperature was –

10.8°C at about 1630 on 18 May

5.1°C at 1030 on 19 May

1.7°C at 0915 on 20 May

-- this range of daily temperature variation was observed on both sampling trips. (Arctic grayling are thought to spawn at 4°C).

The 3 channels of Yerrick Creek drain into a backwater slough of the Tanana River. Although there was no surface water flow from the creek to the river, there was water in that slough. Water temperature was 10.5°C. We observed approximately 12 grayling in a tight school. The fish appeared to be roughly 250-300 mm in length. They were easily spooked, and did not respond to spinners or flies. We also observed 1 round whitefish, of approximately 300 mm in length, dozens of small (~20 mm) grayling, and hundreds of tiny (<10 mm) fish (species unknown). We captured no fish in the fish traps.

Above the powerhouse site on 19-20 May, we captured 1 Dolly Varden (225 mm FL) in a trap, but observed no other fishes in this area.

Second Sampling Session

During the field trip of 27-29 May 2009, the flow in the creek was much greater, and the water appeared to be more turbid, than it had been a week earlier. At the bridge, the water was flowing in 2 channels (vs. one 1 channel, a week before), and was –

5.1°C at 1010 on 27 May

4.1°C at 0600 on 28 May, after a cool night

7.1°C at 1240 on 28 May

2.8°C at 0610 on 29 May, after a rainy night

3.5°C at 0925 on 29 May

5.3°C at 1455 on 29 May

Yerrick Creek was flowing into the Tanana River (the slough where we had earlier sampled) through its 3 main channels. Just above those confluences, the creek was braided through the forest, with several small channels and overland flows (among the trees). In these small channels, we observed 2 individual grayling (the fish were widely separated, not aggregated).

We observed no fish in the lower creek (below the bridge), on either the rocky or sandy substrates, but we did capture 2 slimy sculpin in a trap. Water temperature in the lower creek was –

6.8°C at 1145 on 28 May

4.5°C at 1135 on 29 May

Above the powerhouse site, we captured 7 Dolly Varden in traps, but observed no other fishes, with any sampling method. Water temperature in this area was –

7.5°C at 1325 on 28 May

3.7°C at 1330 on 29 May

During this second field trip, we found some of the fish traps in different positions from where we had set them. They appeared to have been moved to the shore or (in one case) out of the water by an overnight flood event.

To summarize the first two samplings -- For grayling to spawn in Yerrick Creek, 2 factors are necessary – water temperature of 4-5°C, and continuity of water flow from the creek to the river. As expected, we observed a school of grayling in the Tanana River very near the mouth of Yerrick Creek, before the creek had reached the river. Those fish were apparently waiting to enter the creek. After the creek had reached the river, we observed grayling in the sandy-bottom, slower-flowing "delta" channels of the creek, but no grayling in the rocky-bottom, faster-flowing cascading parts of the creek. Also, we did not observe aggregations of grayling anywhere in Yerrick Creek.

Third Sampling Session

We sampled Yerrick Creek on 7 June 2009. The weather was cool and rainy in the morning, but turned mostly sunny and warm in the afternoon. Water was clear, and 5.4C at 1100.

The purpose of this sampling was to observe and capture Arctic grayling in lower Yerrick Creek, and to compare grayling's use of the creek for spring spawning by adults vs. summer feeding by

juveniles. Sampling methods included: visual observation with polarized lenses, angling with spin and fly gear, and herding fish downstream through pools into a bag seine, which was stretched across the creek.

We observed no fishes in the fast flow / boulder substrate zone, or in the slow flow / sand substrate zone. In the transition zone, we captured 1 grayling, and observed 4 individual (not aggregated) grayling: 2 of these were roughly 200 mm long, and 2 fish were approximately 100 mm long. The captured grayling was 208 mm fork length, and did not appear to be in either a pre-spawning or post-spawning condition.

I took scale samples from the captured grayling, and released it in apparent good condition. I drove to Delta, and met with ADFG's Fronty Parker. We discussed my findings, and we pressed and read the sample of scales that I took from the fish I caught on Sunday (6/7). That grayling was 2 or 3 years old, definitely juvenile, not a spawning adult.

Based on my sampling in early September 2008, and on these three sampling sessions in May-June 2009, a picture of grayling use of Yerrick Creek seems to have emerged. Grayling appear to use parts of Yerrick Creek (below and within the bypass reach) for summer feeding, on an opportunistic basis. While I cannot prove that grayling do not spawn in Yerrick Creek, I have found no evidence to support it --

* The creek did not connect to the river at the expected time of grayling spawning.

* I observed no aggregations of grayling anywhere in Yerrick Creek; all grayling observed in the creek in May-June 2009 appeared to be individual fish.

* I observed no adult-size grayling, and the largest grayling observed in June 2009 (the 2- or 3-year-old) did not appear to be in either a pre-spawning or post-spawning condition.

GRAYSTAR

REPORT

FISHERIES BASELINE STUDY

for a

PROPOSED HYDROELECTRIC DEVELOPMENT

on

YERRICK CREEK

near

TOK, ALASKA

prepared for –

ALASKA POWER & TELEPHONE Company
Port Townsend, Washington

by –

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October 2008

1 -- INTRODUCTION

ALASKA POWER AND TELEPHONE COMPANY (AP&T) has proposed to install a hydroelectric project on Yerrick Creek, near Tok, Alaska. This document is the report of the first year of a fisheries baseline study, in support of that project.

The study area included Yerrick Creek (YER) and Cathedral Rapids Creek #1 (CR1). These streams are small tributaries of the upper Tanana River, in eastern interior Alaska. The fish and fisheries of the upper Tanana River drainage are studied and managed by the Alaska Department of Fish & Game (ADFG, or "the department"). Neither YER nor CR1 are listed in ADFG's Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes and its associated Atlas -- http://www.sf.adfg.state.ak.us/SARR/awc/ -- although the Tanana River itself is listed.

YER and CR1 lie within ADFG's Upper Tanana Management Area (UTMA), which is within ADFG's fishery management region III, also known as the Arctic-Yukon-Kuskokwim (AYK) region (Figure 1). The UTMA encompasses Delta Junction, Tok, and several smaller communities (Figure 2).

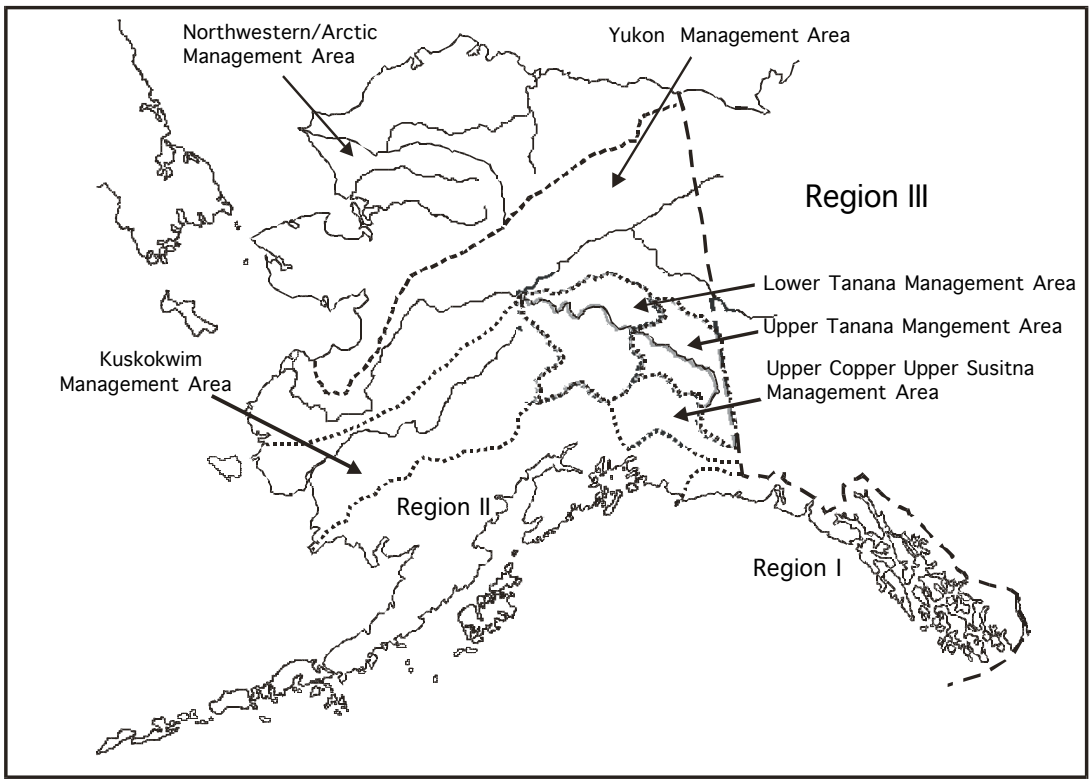

Figure 1 -- Map of ADFG's Sport Fish Regions, and the Six Region III Management Areas
source: Parker 2006

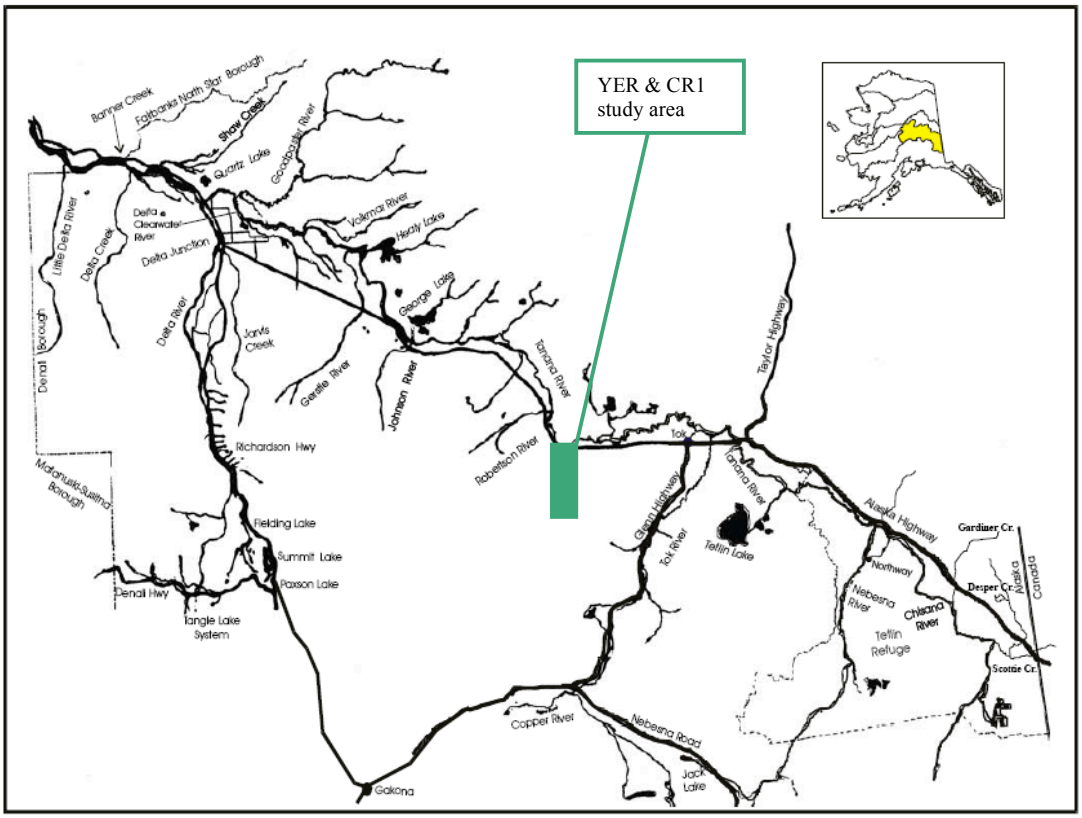

Figure 2 -- Map of the Upper Tanana Management Area within the Tanana River Drainage
source: Parker 2006

Several fish species are found in the UTMA –

Common Name	*Scientific Name*
chinook (king) salmon	*Oncorhynchus tshawytscha*
coho (silver) salmon	*Oncorhynchus kisutch*
chum (keta) salmon	*Oncorhynchus keta*
Arctic grayling	*Thymallus arcticus*
burbot	*Lota lota*
lake trout	*Salvelinus namaycush*
Dolly Varden	*Salvelinus malma*
round whitefish	*Coregonus cylindraceum*
least cisco	*Coregonus sardinella*
humpback whitefish	*Coregonus pidschian*
northern pike	*Esox lucius*

ADFG's Division of Sport Fish publishes an annual Fishery Management Report for Sport Fisheries in the Upper Tanana River Drainage. These reports focus on the more abundant sport-caught fishes: coho salmon, Arctic grayling, northern pike, lake trout, and burbot. Dolly Varden char are not explicitly studied. The most recent available such report (as of October 2008) is Parker 2006.

ADFG has stocked rainbow trout (*Oncorhynchus mykiss*), Arctic char (*Salvelinus alpinus*), coho salmon, Arctic grayling, and lake trout in selected waters of the Upper Tanana area (Parker 2006).

In general, there is less sport fishing effort in the UTMA, as compared to the Lower Tanana Management Area (Parker 2006); for example, in 2005 --

* 33% of anglers in the Tanana River drainage fished in UTMA
* 30% of fishing trips in the Tanana River drainage were in UTMA
* 28% of fishing effort in the Tanana River drainage was in UTMA
* 39% of fish harvest in the Tanana River drainage was in UTMA

In 2005, Arctic grayling comprised over half of the sport fish catch, but less than one-third of the sport fish harvest (fish caught and retained) in UTMA (Parker 2006) –

Species	Catch	% of Catch[d]	Harvest	% of Harvest[e]	% Harvested
Salmon					
* chinook	25	0.03	25	0.15	100.0
* coho[a]	2,830	2.97	267	1.61	9.4
* coho[b]	2,973	3.12	1,002	6.02	33.7
* chum	686	0.72	0	0.0	0.0
Non-Salmon					
* rainbow trout	17,355	18.20	6,336	38.10	36.5
* lake trout	3,651	3.83	569	3.42	15.6
* char[c]	1,453	1.52	463	2.78	31.8
* Arctic grayling	55,943	58.66	5,242	31.52	9.4
* northern pike	8,299	8.70	1,646	9.90	19.8
* whitefish	455	0.48	60	0.36	30.5
* burbot	1,370	1.44	1,021	6.14	74.8
* sheefish	0	0.0	0	0.0	0.0
* other fishes	321	0.34	0	0.0	0.0
TOTAL	95,361		16,631		17.4

[a] – anadromous salmon
[b] – landlocked coho & Chinook salmon
[c] – includes Arctic char & Dolly Varden
[d] – the species' percent of UTMA total catch, calculated from Table 7 in Parker 2006
[e] – the species' percent of UTMA total harvest, calculated from Table 7 in Parker 2006

The preceding table shows that 1.52% of the catch, and 2.78% of the harvest, were composed of "char", which includes both wild Dolly Varden and stocked Arctic char.

Because of their wide distribution and comparatively high abundance, Arctic grayling are important to both sport and subsistence harvesters. As such, they have been extensively studied by ADFG scientists for decades. In the Tanana River drainage, grayling exhibit a wide range of age and size at maturity (Clark 1992). Similar studies have not been conducted for Dolly Varden in the upper Tanana drainage, but anecdotal observations indicate that Dolly Varden in that area may reach maturity and spawn at small sizes (< 200 mm fork length) (J.F. Parker, ADFG, personal communication, 2008), and even while exhibiting so-called "juvenile" characteristics such as parr marks (A.E. Rosenberger, University of Alaska Fairbanks, School of Fisheries & Ocean Sciences, personal communication, 2008).

ADFG has conducted comprehensive fish surveys of the streams of the middle and lower Tanana River drainage, including clear, clear/glacial, glacial, humic/glacial, and humic creeks and rivers, and found no Dolly Varden in any of those habitats (Durst 2001, Hemming & Morris 1999).

Arctic grayling conduct seasonal migrations among overwintering, spawning, and summer feeding habitats, and seasonal changes in water temperature are generally considered to be the triggers for those movements (Ridder 1995, Ridder 1994, and several previous studies cited in those reports. Similar studies have not been conducted for Dolly Varden in the upper Tanana drainage, but anecdotal reports indicate that there may be year-round resident populations of Dolly Varden in the upper reaches of Yerrick Creek (J.F. Parker, ADFG, personal communication, 2008).

In 1988, 367 Tok households were surveyed to determine their subsistence use of fish, game, and plant resources. Most households used subsistence-caught salmon (79.4%) and freshwater fish (71.4%). In the freshwater fish category, the predominant subsistence species were grayling (55.7%), burbot (40.2%), rainbow trout (35.0%), large pike (27.2%), whitefish (25.9%), and lake trout (22.9%). Only 0.9% of Tok households reported using subsistence-caught Dolly Varden. The report does not identify where these various fish species were harvested, but because the Tok data set includes marine fish (27.5%), such as halibut, it appears that Tok residents harvest subsistence fisheries resources far from home, and not only in the local Tok area (McMillan & Cuccarese 1988).

In conclusion, Arctic grayling are the most commonly sport-caught fish in the UTMA, and the second-most common sport-harvested species. Grayling are also taken by subsistence harvesters. Dolly Varden are comparatively uncommon in the UTMA, in both the sport and subsistence harvests, and were not reported by either of two ADFG scientific investigations.

Finally, in the late 1970s and early 1980s, the Alaska Department of Fish & Game's Division of Fisheries Rehabilitation, Enhancement, & Development (FRED) investigated possible sites for salmon hatcheries throughout Alaska. In a survey of Yerrick Creek in February 1980, Raymond (1980) reported –

* the Upper Tanana River Valley has many ingredients for a good hatchery site: year-round highway access, high-gradient streams, and hardly any salmon
* most of the creeks in this area dry up in winter
* there was no evidence of running water at the highway bridge
* there was evidence of running water at two sites: 1 mile and 2 miles upstream of the highway
* water temperature was too low for a flow-through hatchery
* there was plenty of hydropower available

2 -- METHODS

YER is characterized by steep gradient, cascading flows, and large boulder substrate. The channels appear to be dynamic, as judged by cleanliness of the substrate in and near the water: very little periphyton and almost no terrestrial vegetation. There are few pools in YER that appear capable of providing habitat for fishes. Those pools are small, in the range of 10-20 ft long.

CR1 is much smaller and steeper than YER. It is essentially one long, cascading run, with strong current and large boulder substrate. Small pools are apparent only at very low flows. For example, in June (lower flow than in September), a pool of roughly 10 ft wide x 20 ft long x 2 ft deep was observed at WP 037: 63°21.595'N 143°43.005'W elevation: 2,239 ft but this pool could not be located in early September, when flow was greater. Similarly, a few smaller pools were observed in June, but by early September, the dynamic channel appeared to have shifted so that they were no longer apparent.

During sampling visits in summer 2008, the wetted perimeters of both streams were much smaller (narrower) than their respective dynamic channels (area of clean boulders).

The fish sampling stations on YER and CR1 were selected to bracket the area of interest to AP&T's proposed project (Figure 3) –

* Station UYC: upper Yerrick Creek, well above the hydropower impoundment site
* Station UMY: middle/upper Yerrick Creek, above the impoundment site
* Station YCI: Yerrick Creek, in the general vicinity of the proposed impoundment
* Station MYC: middle Yerrick Creek, between the impoundment and the powerhouse
* Station LYC: lower Yerrick Creek, downstream of the proposed powerhouse
* Station CRI: Cathedral Rapids Creek #1, in the vicinity of the proposed impoundment

The purpose of this study was to characterize the seasonal presence and distribution of fishes in the two streams.

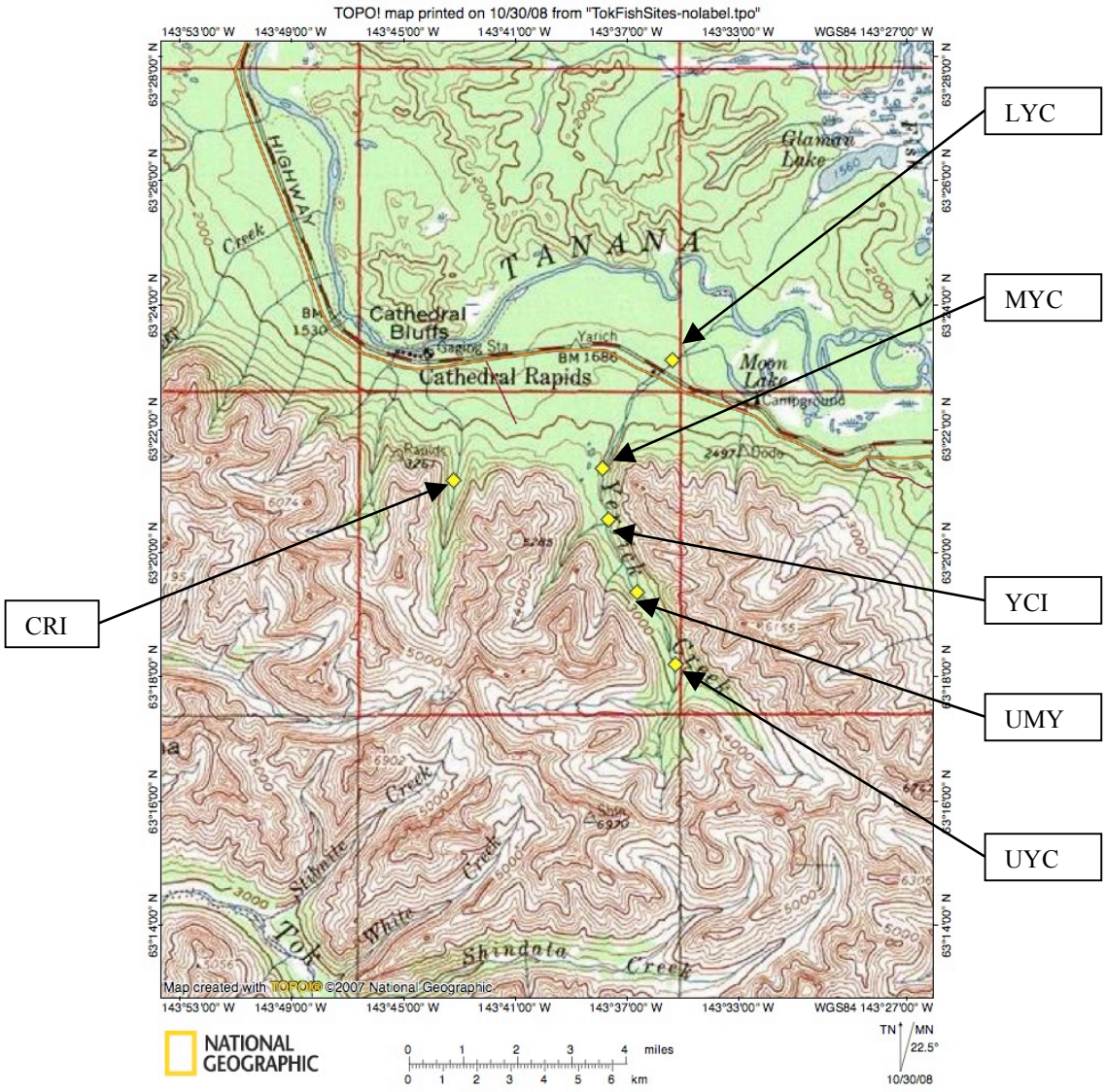

Figure 3 -- Sampling Sites for the 2008 Fisheries Baseline Study

The two creeks were visited on foot and examined, but not sampled, 6-7 June 2008. Fish habitat was generally characterized, and the locations of possible fish-bearing pools were recorded.

Sampling, supported by helicopter, was conducted –

* 3-4 September 2008 (YER and CR1); this sampling was originally scheduled for early August, in order to sample fish in their summer habitats, but because of unusually heavy and prolonged rains and flooding in the Tok area, the trip was postponed twice until early September; nevertheless, the weather and water were warm and summer-like, but the water flow was still noticeably higher than in June

* 29-30 September 2008 (YER only); this sampling was intended to sample fish immediately before freeze-up, in order to understand the species winter habitats; the water flows were lower than in early September

Sampling methods included --

* electrofisher + bag seine (the electrofisher was used to herd the fish into the bag seine, rather than stunning them); it was difficult to maintain the seine in the current at some sites, and impossible at other sites; also, this was more effective in late September, because flow was less than in early September; where it was not possible to maintain the bag seine in strong current, electrofishing was performed as best as possible along the sides of the stream and in small backwater areas; in most cases, electrofishing was performed by two people: one bearing the backpack unit, and the other using a dipnet

* minnow traps baited with commercially cured salmon eggs and left to soak overnight in pools, where pools could be found; fewer pools were visible during early September (higher flow) vs. in late September (lower flow), so that traps were not set at all sites in early September

GPS coordinates, as displayed on a brand new Garmin GPS unit, do not appear to match the apparent location as displayed in Figure 3, which is drawn from a brand new version of the TOPO! mapping software. It is not clear if the error is within the GPS unit, the software, or in the interaction between the two. In this report, the GPS readings are listed in Appendix A, and the apparent location is shown in Figure 3.

3 -- RESULTS

Fish sampling was conducted under ADFG Fish Resource Permit SF2008-172. A report of those activities was submitted to ADFG on 27 October 2008, and is attached to this report as Appendix A. Two species of fish were captured: Dolly Varden (DV) and Arctic grayling (AG). All fishes were measured and released alive, in apparent good condition. The results of the 2008 fish sampling were –

YERRICK CREEK – 3-4 September 2008

Station UYC

** 1 minnow trap + electrofish ~40 yds of stream

DV (5): 127, 122, 120, 127, 117 mm fork length (FL)

Station YCI

** 2 minnow traps + electrofish ~160 yds of stream
DV (4): 135, 110, 102, 115 mm FL
AG (3 possible males): 220, 235, 190 mm FL
AG (1 possible female): 207 mm FL
AG (7 undetermined sex): 165, 150, 148, 190, 148, 162, 148 mm FL

Station MYC

* not possible to set bag seine: current too strong, too wide in run, too deep & fast
* not possible to set minnow trap: current too strong, no slow water
* water still high & fast >10 days after latest rain; thalweg depth 3.5-4.0 ft
* attempted electrofishing along ~50 yards of shoreline: sighted 1 fish ~150mm, species unknown

Station LYC

* set of seine not very good; current very strong
* electrofish ~35 yards downstream to seine: no fish observed
* no other fish-able sites nearby or anywhere below old pipeline corridor
* no minnow trap set here

YERRICK CREEK – 29-30 September 2008

Station UYC

** 1 minnow trap
DV (3): 175, 126, 145 mm FL

Station UMY

** 1 minnow trap + electrofish ~ 25 yds of stream
DV (4): 125, 147, 159, 142 mm FL
+ 1 DV sighted

Station YCI

** 2 minnow traps + electrofish ~40 yds of stream
DV (14): 124, 131, 167, 133, 131, 137, 136, 128, 125, 123, 141, 105, 130, 80 mm FL
DV (1 possible gravid female?): 149 mm FL

Station MYC

* 1 minnow trap + electrofish ~100 yds of stream
  DV (2): 122, 98 mm FL
  DV (1 w/ white-edged fins, possible spawning male?): 164 mm FL
  AG (1): 162 mmFL
  + sighted 3 small fish, each <100 m FL

Station LYC

* 1 minnow trap + electrofish ~100 yds of stream
  AG (1): 79 mm FL

CATHEDRAL RAPIDS CREEK #1 – 3-4 September 2008

Station CRI

* electrofished ~0.1 mile of CR1, roughly near the approximate impound site
  no fish sighted or captured
* no minnow trap set (no pools)

4 – CONCLUSIONS

Yerrick Creek is used by Dolly Varden and Arctic grayling, in occasional small pools separated by long sections of cascading runs.

Dolly Varden were captured in the middle and upper reaches of the creek (including the proposed impoundment area), while Arctic grayling were captured in the middle and lower sections. In this sampling, Arctic grayling were captured less often than were Dolly Varden.

Dolly Varden were commonly encountered in both late summer and late fall (immediately before freeze-up), which suggests that they are year-round residents, including over winter. [Inferring the over-winter habitat of Dolly Varden based on pre-freeze-up surveys and sampling is used by ADFG biologists in other Alaska streams (Scanlon 2008).]

The capture of a possibly gravid female and possibly spawning male suggests that Dolly Varden might spawn in the middle reaches of this stream.

This apparent distribution is consistent with general anecdotal observations of these species in UTMA –

* dwarf Dolly Varden are thought to be year-round residents of upper Yerrick Creek

* Arctic grayling migrate seasonally into and out of lower Yerrick Creek

No fish were captured or sighted in Cathedral Rapids Creek #1, and fish habitat appears to be very scarce. It is not clear to what extent, if any, this cascading stream is used by either fish species.

5 -- RECOMMENDATIONS

The 2008 fisheries sampling has provided useful characterizations of fish presence and distribution in Yerrick Creek and Cathedral Rapids Creek #1, in late summer, late fall, and by inference, over-winter. These data, when supplemented by a sampling in late spring or early summer of 2009, will yield a picture of yearly habitat use of these two streams. This future sampling should be performed at a very low water stage, to allow for thorough electrofishing at all stations.

6 – LITERATURE CITED

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APPENDIX A

Report for FRP SF2008-172

Report of Activities and Collections

27 October 2008

Fish Resource Permit SF2008-172

Stephen T. Grabacki, FP-C; 907-272-5600; graystar@alaska.net

Location: Yerrick Creek (YER) and Cathedral Rapids Creek #1 (CR1)

The two creeks were examined but not sampled 6-7 June 2008. Fish habitat was generally characterized, and the GPS locations of possible fish-bearing pools were recorded.

Sampling was conducted 3-4 September 2008 (YER and CR1), and 29-30 September 2008 (YER only), with electrofisher + bag seine (the electrofisher was used to herd the fish into the bag seine, rather than stunning them), and minnow traps baited with commercially cured salmon eggs and left to soak overnight.

GPS coordinates, as displayed on Grabacki's brand new Garmin GPS unit, do not appear to match the apparent location as displayed on the attached map. In this report, the GPS readings are listed in the text, and the apparent location is shown on the map.

(1) RESULTS FROM 3-4 SEPTEMBER 2008

YERRICK CREEK (YER)

Upper YER, above fork, western channel, well above impoundment, 04SEP08
63°18.204'N 143°35.387'W elevation: 2,830 ft
Minnow trap set 03SEP08@1915, retrieved 04SEP08@1030 –
DV (1): 127 mmFL
Electrofished 2 channels –
* single channel, ~40 yards
* Y-shaped channel, ~80 yards
DV (4): 122, 120, 127, 117 mmFL
All fish in apparent good condition, released alive

Pool at/near impoundment site (above Mike's camp), 03SEP08
Waypoint 009, elevation: 2,284 ft
63°20.435'N 143°37.852'W
Electrofished pool & run, ~30 yards –
DV (1): 115 mmFL
AG (3 possible males): 220, 235, 190 mmFL
AG (1 possible female): 207 mmFL
AG (5 undetermined sex): 150, 148, 190, 148, 162, 148 mmFL
All fishes in apparent good condition, and released alive
Minnow trap set 1430, retrieved 0955 (04SEP08) –
DV (2): 110, 102 mmFL
Fish in apparent good condition, released alive

Pool below impoundment site, 03SEP08
Waypoint 008, elevation: 2,263 ft
63°20.589'N 143°37.684'W
Electrofished 2 channels –
* main channel, ~80 yards: no fish captured or sighted
* side channel, ~50 yards: 1 fish sighted + 2 fish captured –
Arctic grayling (AG) 165mm fork length (FL), apparent good condition, released alive
Dolly Varden (DV) 135 mmFL, apparent good condition, released alive
(DV bore parr marks)
Minnow trap set 1300, retrieved 0930 (04SEP08): no catch

Middle YER, near big cut in hill on west bank
Waypoint 024 on Mike Warner's GPS: 63°21.411'N 143°37.852'W elevation: 2,100 ft
Not possible to set bag seine: current too strong, too wide in run, too deep & fast below pool
Water still high >10 days after latest rain; thalweg depth 3.5-4.0 ft
Attempted electrofishing along ~50 yards of shoreline: sighted 1 fish ~150mm, species unknown
Same conditions downstream ~0.5 mile
Might be able to work this site in lower flow

Lower YER, below highway bridge
63°23.062'N 143°35.538'W elevation: 1,971 ft
Set bag seine below a slight pool
Set of seine not very good; current very strong; lead line not on bottom in some places
My assistant was the anchor for one end of the seine
Electrofished ~35 yards downstream to seine: no fish observed
No other fish-able sites nearby or anywhere below old pipeline corridor

Observation: In June, flow at upper YER was greater than at lower YER. In September, there was stronger flow at mid- and lower YER sites. Judging by wet marks on the rocks, the water level was dropping.

Yerrick Creek is characterized by steep gradient, cascading flows, and large boulder substrate. The channels appear to be dynamic, as judged by cleanliness of the substrate in and near the water: very little periphyton and almost no terrestrial vegetation. There are few pools in YER that appear capable of providing habitat for fishes. Those pools are small, in the range of 10 ft long. Besides the pools that we sampled, other small pools were observed (in June) at –

* 63°22.308'N 143°37.007'W elevation: 1,847 ft
* 63°22.123'N 143°37.104'W elevation: not recorded
* 63°21.572'N 143°37.608'W elevation: 2,050 ft (pool near spur of hill)
* 63°21.582'N 143°37.638'W elevation: 1,930 ft
* 63°21.257'N 143°37.913'W elevation: 2,220 ft (pool near scree slope; 1 AG seen in June)

CATHEDRAL RAPIDS CREEK #1 (CR1)

Station CRI

Electrofished ~0.1 mile of CR1, roughly near the approximate impound site

* from WP 012: 63°21.086'N 143°43.153'W elevation: 2,495 ft
* to WP 011: 63°21.175'N 143°43.163'W elevation: 2,442 ft

No fish sighted or captured

No minnow trap set (no pools)

Note: this site was not really a pool or pools; it was a reach of the stream near the impound site, where we could reasonably set the bag seine and conduct electrofishing.

CR1 is much smaller and steeper than YER. It is essentially one long, cascading run, with strong current and large boulder substrate. In June (lower flow than in September), a pool of roughly 10 ft wide x 20 ft long x 2 ft deep was observed at WP 037: 63°21.595'N 143°43.005'W elevation: 2,239 ft but this pool could not be located in early September. Similarly, a few smaller pools were observed in June, but by early September, the dynamic channel appeared to have shifted so that they were no longer apparent.

(2) RESULTS FROM 29-30 SEPTEMBER 2008

YERRICK CREEK (YER)

Station UYC
Upper YER
Waypoint 026, elevation: 2,811 ft
63° 18.193'N 143°35.406'W
Minnow trap set 29SEP08@1415; retrieved 30SEP08@1320 --
DV (3): 175, 126, 145 mmFL
All fish in apparent good condition, released alive

Station UMY
Upper YER, below WP 026
Waypoint 029, elevation: 2,548 ft
63° 19.371'N 143°36.591'W
Nice pool at big dead spruce and snag
Minnow trap set 29SEP08@1440; retrieved 30SEP08@ 1235 –
DV (3): 147, 159, 142 mm FL
All fish in apparent good condition, released alive.
Electrofished 2 pools, ~25 linear yards of stream –
DV (1): 125 mm FL
+ 1 DV sighted
Fish in apparent good condition, released alive

Station YCI
Pools near impoundment site
Waypoint 030, elevation: 2,242 ft
63° 20.606'N 143°37.686'W
2 minnow traps set 29SEP08@1500, retrieved 30SEP08@1115 –
DV (12): 149*, 133, 131, 137, 136, 128, 125, 123, 141, 105, 130, 80 mm FL
* possible gravid female?
All fish in apparent good condition, released alive.
Electrofished pools near impoundment site, ~25 linear yards of stream –
no fish sighted or captured
Electrofished pool at fork of 3 channels ~100 yards above impoundment site
Waypoint 032, elevation: 2,204 ft
63° 20.521'N 143° 37.773'W
DV (3): 124, 131, 167 mm FL
All fish in apparent good condition, released alive

Station MYC
Middle YER, near big spur of hill ("razorback") on west bank
Waypoint 031, elevation: 2,026 ft
63° 21.623'N 143° 37.565'W
Minnow trap set 29SEP08@1550, retrieved 30SEP08@1400 –
DV (3): 164*, 122, 98 mmFL
* white-edged fins, possible spawning male?
Electrofished ~100 linear yards of stream, in various small pools –
AG (1): 162 mmFL
+ sighted 3 small fish, each <100 m FL
Fish in apparent good condition, released alive

Station LYC
Lower YER, below highway bridge
Waypoint 025, elevation: 1,717 ft
63° 22.878'N 143°36.438'W
Minnow trap set 29SEP08@1350, retrieved 30SEP08@1000 –
* no catch
Electrofished ~100yards of stream –
AG (1): 79 mm FL

9.3.2. – THREATENED, ENDANGERED, SENSITIVE (TES) PLANT REPORT

Yerrick Creek Hydroelectric Project
Tok, Alaska

Threatened, Endangered, and Sensitive (TES) Plant Report

February 2009

Prepared for:
Alaska Power and Telephone Company
PO Box 3222
Port Townsend, WA 98368

Prepared by:

HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503

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Yerrick Creek Hydroelectric Project
Threatened, Endangered, and Sensitive (TES) Plant Report

Key Findings:

No threatened, endangered, or sensitive plants were located within areas likely to be affected by project activities.

The project, as described, is not expected to adversely affect any sensitive plants.

Study Purpose and Location

A threatened, endangered, and sensitive (TES) plant survey was conducted within the Yerrick Creek Hydroelectric project area. The purpose of the study was to determine if there were any individuals or populations of plant species of interest that may be affected by project activities. The survey was conducted at Level 5 intensity (Appendix A).

The project area is located near along Yerrick Creek, a cobble, gravel and sand substrate creek which crosses the Alaska Highway at approximately milepost 1339 (see Figure 1 in the Yerrick Creek Preliminary Jurisdictional Determination Report for wetlands). Most of the project area is undeveloped with an open gravel waterway, islands of mixed hardwood and softwood trees, abandoned gravel side channels in various states of revegetation, and heavily forested banks. Specific legal and geographic descriptions for the property required for Preliminary Jurisdictional Determinations are included in the Preliminary Jurisdiction report for wetlands in Table 1.

The main vegetation of Yerrick Creek study area is typically open paper birch – white spruce forest. Open balsam poplar–white spruce forest and open white spruce forest inhabit drier sites. Open black spruce forest and open dwarf black spruce forest occupy areas with poorly drained soils. Closed tall alder or willow scrub occupies the transitional areas between forested areas and creek channel. Narrow areas of gravel floodplain areas along Yerrick Creek are inhabited by early seral graminoids and forbs. Bluejoint meadows and lowland sedge wet meadows occupy wet areas adjacent to ponds.

Methods

A five-day site visit was completed between August 21st and 25th, 2008, to identify any threatened, endangered, and sensitive plant species in the proposed project area.

To target rare plants within the Yerrick Creek project area, we composed a list of rare plant species likely to be encountered. The target species list was compiled based on the Alaska Natural Heritage Program's (AKNHP) Biotics database. The AKNHP database query did not show the occurrence of rare plants within the project area. This area has not been previously

surveyed for rare plants. Rare plants known in the general vicinity of Tanacross B5 and B6 USGS Quad maps were located from two queries on 7/21/2008. One query was the AKNHP Biotics Database query, and the other was from the Arctos Database at the University of Alaska-Fairbanks (UAF), which lists all known herbarium records stored at the UAF Herbarium (code letters ALA). The compiled list was reviewed and edited by local botanist Rob Lipkin (pers. com.) Rarity was determined by the AKNHP's 2006 Vascular Plant Tracking list (Lipkin, 2008).

Table 1: Preliminary list of potential rare plants (for explanation of Rarity Rank, see Appendix A).

Scientific Name	Common Name	Family	Global Rarity Rank	State Rarity Rank	Possible Habitat
Agrostis clavata	clavate bentgrass	Poaceae	G4G5	S1S2	Open balsam poplar-white spruce forest. Bare soils, wet meadows
Carex heleonastes	Hudson Bay sedge	Cyperaceae	G4G5	S2S3	Peat bogs, swamps
Castilleja annua		Scrophulariaceae	G3G4Q	S3S4	Waste places
Ceratophyllum demersum	coon's tail	Ceratophyllaceae	G5	S1	Ponds, lakes, and slow moving streams and rivers. Either anchored in the mud or floating freely near the surface.
Draba paysonii	Payson's draba	Brassicaceae	G5	S1S2	Gravel cutbank in glacial cirque
Lupinus kuschei	Yukon lupine	Fabaceae	G3	S2	roadsides
Montia bostockii	Bostock's minerslettuce	Portulacaceae	G3	S3	Wet places in the mountains
Phacelia mollis	soft phacelia	Hydrophyllaceae	G2G3	S2S3	Tall white spruce-aspen forest, coarse sand, dry sand beach, dry alpine tundra meadows.
Poa secunda	curly bluegrass	Poaceae	G5	SNA	Meadows, open woods
Taraxacum carneocoloratum	fleshy dandelion	Asteraceae	G3Q	S3	high alpine scree slopes, extremely rare

Sampling Design

The goal was to visit all vegetation types in the study area and identify all plant species encountered during field work that was focused on wetland mapping. All species were identified in the field or collected for further identification.

We reviewed aerial photography to identify vegetation types most likely to contain the taxa of interest. Habitats of greatest interest included the following:

- Openings in mixed birch – spruce forest,
- Edges of ponds and meadows,
- Seeps and small creeks,
- Gravel river banks along Yerrick Creek.

Daily work was planned to visit as many different habitat types as possible, including those most likely to include rare plants.

Field Methods

Teams traveled by foot while conducting the survey. As new vegetation communities were encountered, sampling points were established and the following data were collected:

- Each plot was georeferenced using a Garmin GPS unit. Survey routes were also mapped.
- Representative photos of the vegetation community were taken at each plot.
- Vegetation type and dominant species by growth form (trees, shrubs, forbs, ferns/ non-vascular plants) were recorded at each site, using the vegetation classification system by Viereck (1992).
- Additional data were gathered specific to the location, habitat, landform, notable plants, bare ground, or other parameters of interest.
- Unidentified plants were collected for lab identification and noted on the field form.
- A complete list of plant species encountered was compiled as the survey progressed.

Collection and Vouchers

Collections were made only if the population was large enough to support removal of individuals. The following data were recorded with each voucher specimen: date, latitude and longitude (Datum: NAD_1983_StatePlane_Alaska_2_FIPS_5002_Feet, in decimal degrees, taken from the Garmin GPS unit), associated species, vegetation type, substrate, notes on characteristics that may not preserve well (e.g., flower color), associated photo number, and other ecological observations. Each voucher specimen was referenced to a specific geographic locality.

Results and Discussion

The HDR project botanist surveyed most of the major vegetation types, and covered much of the geographic extent of the Yerrick Creek project area. The majority of collection locations were concentrated on gravel river bars and shrub areas adjacent to the Yerrick Creek.

More than 100 vouchers were collected. Specimens were given provisional names in the field and later sorted, examined and identified by the HDR botanist. Specimens of notable taxa will be sent to the UAF Herbarium (ALA) for review by the museum staff. Most of these species are widespread in interior Alaska. No non-native species were observed in the Yerrick Creek study area.

In total, 145 species from 40 families were recorded at the area. The complete list of species encountered in Yerrick Creek study area is found in Appendix C.

Two lakes were visited. Aquatic plants were observed and recorded from the shore. The study area was not surveyed for aquatic plants specifically.

Notable Plants

Four notable plants were found in the project area. The AKNHP tracks populations of plants of interest. Notable plants are not considered rare, sensitive, or endangered but are considered to be of ecological interest by the AKNHP.

Phlox sibirica (Siberian phlox) was not previously reported from the area. The closest records of this plant are approximately (UAF 2008):

1. 30 miles NW of Yerrick Creek in Fort Greely Military Reservation in 2004 (63.78°, -145.79°)
2. 45 miles SE of Yerrick Creek at Wrangell-St. Elias National Park and Preserve (62.20266°, -142.123273°)

Figure 2: *Phlox sibirica*, Siberian phlox.

Other notable plants, for which there are no nearby records, include:

1. *Botrychium lunaria* (common moonwort)
2. *Platanthera obtusata* (blunt-leaved orchid)
3. *Astragalus robbinsii* ssp. *harringtonii* (Harold's milkvetch)

Conclusion

No globally or state ranked Rare or Sensitive species were encountered or identified during the survey.

No Endangered species were encountered or identified during the survey. The only plant federally listed or proposed by the U.S. Fish and Wildlife Service in Alaska is *Polystichum aleuticum* C. Christensen, which is endangered. It is only known from Adak Island and is not expected to occur in the project area.

Most plant species observed in the Yerrick Creek project area are considered common and widespread in interior Alaska.

This TES plant survey is significant as a first floristic study in Yerrick Creek area.

Determination of TES Species Made By

Irina Lapina
Vegetation Ecologist
HDR Alaska, Inc.
Date: February 2008

Attachments

Figure 1: TES Survey Map

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Appendices

Appendix A: Survey Intensity and Rarity Rank for Species

Survey intensity level for plants:
LEVEL 1 = "FIELD CHECK"
The surveyor gives the area a quick "once-over" but does not walk completely through the project area. The entire project area has not been examined.
LEVEL 2 = "CURSORY"
The surveyor gives the area a "once-over" by walking through the project area. The entire project area has not been examined.
LEVEL 3 = "LIMITED FOCUS"
The surveyor closely examines one or more habitat-specific locations within the project area, but does not look at the rest of the area.
LEVEL 4 = "GENERAL"
The surveyor gives the area a closer look by walking through the project area and walking around the perimeter of the area or by walking more than once through the area. Most of the project area is examined.
LEVEL 5 = "INTUITIVE CONTROLLED"
The surveyor has closer look by conducting a complete examination of specific areas of the project after walking through the project area and perimeter or by walking more than once through the area.
LEVEL 6 = "COMPLETE"
The surveyor has walked throughout the survey area until nearly all of the area has been examined.

Rarity Rank for Species:

The rarity rank is a value that best characterizes the relative rarity or endangerment of a native taxon within the specified geographic boundaries (i.e., range-wide for global, or within-state or province for subnational).

In general, NatureServe Central Science staff assign global, U.S., and Canadian national Element ranks with guidance from local Heritage Programs/Conservation Data Centres, especially for endemic Elements, and from experts on particular taxonomic groups. Local installations assign subnational ranks for Elements in their respective jurisdictions.
Only the following rank components should be entered in this Rank field:

The appropriate geopolitical-level prefixes currently in use are:
G = global
S = subnational

Allowable values are:
1 = critically imperiled
2 = imperiled
3 = vulnerable

4 = apparently secure
5 = secure
H = possibly extinct
X = presumed extinct
U = unrankable
NR = not ranked
NA = not applicable (Element is not a suitable target for conservation)

If applicable, an indicator of uncertainty about the rank, either in the form of a range rank or a "?" qualifier following a numeric basic rank.

For national and subnational ranks, a suffix that describes the population of a migratory species, as follows:
B = breeding population
N = nonbreeding population
M = transient population

Ranks for one, two, or all three population segments can be entered, separated by commas (e.g., S1B,S2N,S3M).

For global ranks, if applicable, an appended T-rank for an infraspecies.
For global ranks, if applicable, a qualifier after the basic rank in the form of a Q indicating questionable taxonomy, or a C indicating captive or cultivated

Species Ranks used by the Alaska Natural Heritage Program
Species Global Rankings
G1: Critically imperiled globally (5 or fewer occurrences)
G2: Imperiled globally (6-20 occurrences)
G3: Rare or Uncommon globally (20-100 occurrences)
G4: Apparently secure globally, but cause for long-term concern (>100 occurrences)
G5: Demonstrably secure globally
G#G# Rank of species uncertain, best described as a range between two ranks
G#Q Taxonomically questionable
G#T# Global rank of species and global rank of the described variety or subspecies

Species State Rankings
S1: Critically imperiled in state (5 or fewer occurrences)
S2: Imperiled in state (6-20 occurrences)
S3: Rare or Uncommon in state (20-100 occurrences)
S4: Apparently secure in state, but cause for long-term concern (>100 occurrences)
S5: Demonstrably secure in state
S#S# Rank of species uncertain, best described as a range between two ranks

For further information concerning rare plant species for this area, please contact the Alaska Natural Heritage Program Botanist (907) 257-2785.

Appendix B: Plants Recorded at Sample Plots

Scientific Name	Plot Number	Latitude	Longitude	Elevation (ft)	Habitat
Betula papyrifera	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Picea glauca	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Alnus viridis ssp. crispa	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Betula glandulosa	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Ledum groenlandicum	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Vaccinium vitis-idaea	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Vaccinium uliginosum	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Salix scouleriana	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Geocaulon lividum	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Salix alaxensis	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Calamagrostis canadensis	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Lycopodium annotinum	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Polygonum alaskanum	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Cornus canadensis	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Carex sp.	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
feather moss	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
lichens	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Polytrichum sp.	1	63.34361	-143.63515	2479	open paper birch-white spruce forest
Picea mariana	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Ledum groenlandicum	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Salix pulchra	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Betula glandulosa	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Vaccinium vitis-idaea	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Empetrum nigrum	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Alnus viridis ssp. crispa	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Andromeda polifolia	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Lycopodium annotinum	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Equisetum arvense	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Equisetum sylvaticum	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Vaccinium oxycoccus	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Geocaulon lividum	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Carex sp.	2	63.34405	-143.63589	2407	dwarf open black spruce forest
feather mosses	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Sphagnum russowii	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Sphagnum sp.	2	63.34405	-143.63589	2407	dwarf open black spruce forest
lichen	2	63.34405	-143.63589	2407	dwarf open black spruce forest
Betula glandulosa	3	63.34571	-143.63655	2378	open black spruce forest
Ledum groenlandicum	3	63.34571	-143.63655	2378	open black spruce forest
Vaccinium vitis-idaea	3	63.34571	-143.63655	2378	open black spruce forest
Empetrum nigrum	3	63.34571	-143.63655	2378	open black spruce forest
Vaccinium uliginosum	3	63.34571	-143.63655	2378	open black spruce forest
Salix glauca	3	63.34571	-143.63655	2378	open black spruce forest
Carex sp.	3	63.34571	-143.63655	2378	open black spruce forest
Rubus chamaemorus	3	63.34571	-143.63655	2378	open black spruce forest
Trientalis europaea	3	63.34571	-143.63655	2378	open black spruce forest

Scientific Name	Plot Number	Latitude	Longitude	Elevation (ft)	Habitat
Geocaulon lividum	3	63.34571	-143.63655	2378	open black spruce forest
Petasites frigidus x hyperboreoides	3	63.34571	-143.63655	2378	open black spruce forest
Vaccinium oxycoccus	3	63.34571	-143.63655	2378	open black spruce forest
Polytrichum sp.	3	63.34571	-143.63655	2378	open black spruce forest
Sphagnum sp.	3	63.34571	-143.63655	2378	open black spruce forest
Agrostis sp.	4	63.34128	-143.63066	2285	active channel, partially vegetated
Arabis lyrata	4	63.34128	-143.63066	2285	active channel, partially vegetated
Artemisia tilesii	4	63.34128	-143.63066	2285	active channel, partially vegetated
Calamagrostis inexpansa	4	63.34128	-143.63066	2285	active channel, partially vegetated
Epilobium latifolium	4	63.34128	-143.63066	2285	active channel, partially vegetated
Festuca rubra	4	63.34128	-143.63066	2285	active channel, partially vegetated
Poa alpina	4	63.34128	-143.63066	2285	active channel, partially vegetated
Poa arctica	4	63.34128	-143.63066	2285	active channel, partially vegetated
Poa arctica ssp. lanata	4	63.34128	-143.63066	2285	active channel, partially vegetated
Poa palustris	4	63.34128	-143.63066	2285	active channel, partially vegetated
Poa pratensis	4	63.34128	-143.63066	2285	active channel, partially vegetated
Salix alaxensis	4	63.34128	-143.63066	2285	active channel, partially vegetated
Trisetum spicatum	4	63.34128	-143.63066	2285	active channel, partially vegetated
Picea glauca - sapling	5	63.34141	-143.63107	2288	closed tall alder scrub
Alnus viridis ssp. crispa	5	63.34141	-143.63107	2288	closed tall alder scrub
Salix alaxensis	5	63.34141	-143.63107	2288	closed tall alder scrub
Populus balsamifera - sapling	5	63.34141	-143.63107	2288	closed tall alder scrub
Dryopteris fragrans	5	63.34141	-143.63107	2288	closed tall alder scrub
Calamagrostis canadensis	5	63.34141	-143.63107	2288	closed tall alder scrub
Artemisia tilesii	5	63.34141	-143.63107	2288	closed tall alder scrub
Poa glauca	5	63.34141	-143.63107	2288	closed tall alder scrub
Silene menziesii ssp. williamsii	5	63.34141	-143.63107	2288	closed tall alder scrub
Populus balsamifera	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Picea glauca	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Alnus viridis ssp. crispa	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Salix alaxensis	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Ribes triste	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Rosa acicularis	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Spiraea beauverdiana	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Calamagrostis canadensis	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Artemisia tilesii	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Stellaria sp. - no flowers	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Boschniakia rossica	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Pyrola sp.	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Poa glauca	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Aster sibiricus	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Angelica lucida	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Aconitum delphinifolium	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Geocaulon lividum	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Mertensia paniculata	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Taraxacum sp.	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest
Anemone richardsonii	6	63.34259	-143.63077	2287	open balsam poplar-white spruce forest

Scientific Name	Plot Number	Latitude	Longitude	Elevation (ft)	Habitat
Betula papyrifera	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Picea glauca	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Populus balsamifera	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Geocaulon lividum	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Alnus viridis ssp. crispa	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Rosa acicularis	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Salix barclayi	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Ribes triste	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Rubus idaeus	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Ledum groenlandicum	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Calamagrostis canadensis	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Equisetum pratense	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Cornus canadensis	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Vaccinium vitis-idaea	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Epilobium angustifolium	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Linnaea borealis	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Polygonum alaskanum	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Geocaulon lividum	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Pyrola secunda	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Aconitum delphiniifolium	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Equisetum sp.	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Hylocomium splendens	7	63.34992	-143.63422	2274	open paper birch-white spruce forest
Salix barclayi	8	63.35283	-143.63574	2257	fresh sedge marsh and open water
Chamaedaphne calyculata	8	63.35283	-143.63574	2257	fresh sedge marsh and open water
Carex aquatilis	8	63.35283	-143.63574	2257	fresh sedge marsh and open water
Eriophorum sp.	8	63.35283	-143.63574	2257	fresh sedge marsh and open water
Calamagrostis canadensis	8	63.35283	-143.63574	2257	fresh sedge marsh and open water
Potentilla palustris	8	63.35283	-143.63574	2257	fresh sedge marsh and open water
Equisetum fluviatile	8	63.35283	-143.63574	2257	fresh sedge marsh and open water
Populus tremuloides	9	63.35394	-143.63544	2289	bluejoint herb meadow
Iris setosa	9	63.35394	-143.63544	2289	bluejoint herb meadow
Calamagrostis canadensis	9	63.35394	-143.63544	2289	bluejoint herb meadow
Carex lyngbyei	9	63.35394	-143.63544	2289	bluejoint herb meadow
Carex spp.	9	63.35394	-143.63544	2289	bluejoint herb meadow
Callitriche verna	9	63.35394	-143.63544	2289	bluejoint herb meadow
Alopecurus aequalis	9	63.35394	-143.63544	2289	bluejoint herb meadow
Juncus filiformis	9	63.35394	-143.63544	2289	bluejoint herb meadow
Rorippa palustris	9	63.35394	-143.63544	2289	bluejoint herb meadow
Ranunculus filiformis	9	63.35394	-143.63544	2289	bluejoint herb meadow
Agropyron sp.	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Alnus viridis ssp. crispa	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Artemisia tilesii	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Aster sibiricus	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Boschniakia rossica	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand

Scientific Name	Plot Number	Latitude	Longitude	Elevation (ft)	Habitat
Calamagrostis canadensis	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Calamagrostis purpurascens	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Dryopteris fragrans	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Epilobium angustifolium	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Geocaulon lividum	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Hylocomium splendens	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Leymus mollis	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Linnaea borealis	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Lupinus nootkatensis	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Mertensia paniculata	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Moehringia lateriflora	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Picea glauca	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Goodyera repens	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Lupinus nootkatensis	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Poa glauca	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Poa pratensis	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Ribes triste	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Rosa acicularis	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Saxifraga cespitosa	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Shepherdia canadensis	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Silene menziesii ssp. williamsii	14	63.37882	-143.60716	1806	open black spruce forest, with bare ground channel - sand
Alnus viridis ssp. crispa	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Vaccinium uliginosum	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Betula glandulosa	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Empetrum nigrum	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Ledum groenlandicum	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Chamaedaphne calyculata	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Carex aquatilis	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Andromeda polifolia	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Lycopodium annotinum	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Carex sp. - peat forming	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Rubus chamaemorus	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow

Scientific Name	Plot Number	Latitude	Longitude	Elevation (ft)	Habitat
Geocaulon lividum	15	63.36281	-143.63779	2190	subarctic lowland sedge wet meadow
Carex aquatilis	16	63.36144	-143.63693	2229	pond
Nuphar lutea	16	63.36144	-143.63693	2229	pond
Carex lyngbyei	16	63.36144	-143.63693	2229	pond
Iris setosa	16	63.36144	-143.63693	2229	pond
Potamogeton zosteriformis	16	63.36144	-143.63693	2229	pond
Populus balsamifera	18	63.37563	-143.61504	1843	open alder tall shrub
Picea glauca	18	63.37563	-143.61504	1843	open alder tall shrub
Alnus viridis ssp. crispa	18	63.37563	-143.61504	1843	open alder tall shrub
Rubus idaeus	18	63.37563	-143.61504	1843	open alder tall shrub
Populus balsamifera - sapling	18	63.37563	-143.61504	1843	open alder tall shrub
Shepherdia canadensis	18	63.37563	-143.61504	1843	open alder tall shrub
Pyrola secunda	18	63.37563	-143.61504	1843	open alder tall shrub
Calamagrostis canadensis	18	63.37563	-143.61504	1843	open alder tall shrub
Calamagrostis purpurascens	18	63.37563	-143.61504	1843	open alder tall shrub
Artemisia tilesii	18	63.37563	-143.61504	1843	open alder tall shrub
Silene menziesii ssp. williamsii	18	63.37563	-143.61504	1843	open alder tall shrub
Aconitum delphiniifolium	18	63.37563	-143.61504	1843	open alder tall shrub
Poa glauca	18	63.37563	-143.61504	1843	open alder tall shrub
Mertensia paniculata	18	63.37563	-143.61504	1843	open alder tall shrub
Angelica lucida	18	63.37563	-143.61504	1843	open alder tall shrub
Agropyron subsecundum	18	63.37563	-143.61504	1843	open alder tall shrub
lichen	18	63.37563	-143.61504	1843	open alder tall shrub
feather moss	18	63.37563	-143.61504	1843	open alder tall shrub
Hylocomium splendens	18	63.37563	-143.61504	1843	open alder tall shrub
Picea glauca	19	63.37489	-143.61653	1894	open white spruce forest
Rosa acicularis	19	63.37489	-143.61653	1894	open white spruce forest
Geocaulon lividum	19	63.37489	-143.61653	1894	open white spruce forest
Vaccinium vitis-idaea	19	63.37489	-143.61653	1894	open white spruce forest
Shepherdia canadensis	19	63.37489	-143.61653	1894	open white spruce forest
Alnus viridis ssp. crispa	19	63.37489	-143.61653	1894	open white spruce forest
Equisetum pratense	19	63.37489	-143.61653	1894	open white spruce forest
Mertensia paniculata	19	63.37489	-143.61653	1894	open white spruce forest
Astragalus americanus	19	63.37489	-143.61653	1894	open white spruce forest
Calamagrostis canadensis	19	63.37489	-143.61653	1894	open white spruce forest
Boschniakia rossica	19	63.37489	-143.61653	1894	open white spruce forest
Coptis trifolia	19	63.37489	-143.61653	1894	open white spruce forest
Goodyera repens	19	63.37489	-143.61653	1894	open white spruce forest
Erigeron acris	19	63.37489	-143.61653	1894	open white spruce forest
Epilobium angustifolium	19	63.37489	-143.61653	1894	open white spruce forest
Aster sibiricus	19	63.37489	-143.61653	1894	open white spruce forest
Pyrola secunda	19	63.37489	-143.61653	1894	open white spruce forest
Hylocomium splendens	19	63.37489	-143.61653	1894	open white spruce forest
Silene menziesii ssp. williamzii	19	63.37489	-143.61653	1894	open white spruce forest

Appendix C: Project Area Plant Species List

#	Scientific Name	Family
1	Achillea millefolium	Asteraceae
2	Aconitum delphiniifolium	Ranunculaceae
3	Agropyron sp.	Poaceae
4	Agropyron subsecundum	Poaceae
5	Agrostis scabra	Poaceae
6	Agrostis sp.	Poaceae
7	Alnus viridis ssp. crispa	Betulaceae
8	Alopecurus aequalis	Poaceae
9	Andromeda polifolia	Ericaceae
10	Anemone parviflora	Ranunculaceae
11	Anemone richardsonii	Ranunculaceae
12	Angelica lucida	Apiaceae
13	Antennaria sp.	Asteraceae
14	Arabis lyrata	Brassicaceae
15	Arctagrostis latifolia	Poaceae
16	Arctostaphylos uva-ursi	Ericaceae
17	Artemisia alaskana	Asteraceae
18	Artemisia arctica	Asteraceae
19	Artemisia tilesii	Asteraceae
20	Aster sibiricus	Asteraceae
21	Astragalus alpinus	Fabaceae
22	Astragalus americanus	Fabaceae
23	Astragalus robbinsii ssp. harringtonii	Fabaceae
24	Betula glandulosa	Betulaceae
25	Betula papyrifera	Betulaceae
26	Boschniakia rossica	Orobanchaceae
27	Botrychium lunaria	Ophioglossaceae
28	Calamagrostis canadensis	Poaceae
29	Calamagrostis inexpansa	Poaceae
30	Calamagrostis lapponica	Poaceae
31	Calamagrostis purpurascens	Poaceae
32	Calamagrostis purpurascens ssp. purpurascens	Poaceae
33	Callitriche verna	Callitrichaceae
34	Campanula lasiocarpa	Campanulaceae
35	Carex aquatilis	Cyperaceae
36	Carex brunnescens	Cyperaceae
37	Carex canescens	Cyperaceae
38	Carex loliacea	Cyperaceae
39	Carex magellanica	Cyperaceae
40	Carex saxatilis	Cyperaceae
41	Carex scirpoidea	Cyperaceae
42	Carex tenuiflora	Cyperaceae
43	Carex utriculata	Cyperaceae
44	Cerastium sp.	Caryophyllaceae
45	Chamaedaphne calyculata	Ericaceae
46	Coptis trifolia	Ranunculaceae
47	Cornus canadensis	Cornaceae
48	Crepis elegans	Asteraceae

#	Scientific Name	Family
49	Dasiphora fruticosa ssp. floribunda	Rosaceae
50	Dryopteris fragrans	Dryopteridaceae
51	Empetrum nigrum	Ericaceae
52	Epilobium angustifolium	Onagraceae
53	Epilobium latifolium	Onagraceae
54	Equisetum arvense	Equisetaceae
55	Equisetum fluviatile	Equisetaceae
56	Equisetum pratense	Equisetaceae
57	Equisetum scirpoides	Equisetaceae
58	Equisetum sylvaticum	Equisetaceae
59	Erigeron acris	Asteraceae
60	Erigeron acris ssp. polatus	Asteraceae
61	Eriophorum brachyantherum	Cyperaceae
62	Eriophorum vaginatum	Cyperaceae
63	Festuca brachyanterum	Poaceae
64	Festuca brachyphylla	Poaceae
65	Festuca rubra	Poaceae
66	Geocaulon lividum	Santalaceae
67	Goodyera repens	Orchidaceae
68	Hedysarum mackenzii	Fabaceae
69	Hierochloe alpina	Poaceae
70	Hierochloe odorata	Poaceae
71	Iris setosa	Iridaceae
72	Juncus castaneus	Juncaceae
73	Juncus filiformis	Juncaceae
74	Ledum groenlandicum	Ericaceae
75	Leymus innovatus	Poaceae
76	Linnaea borealis	Caprifoliaceae
77	Lupinus arctica	Fabaceae
78	Lupinus nootkatensis	Fabaceae
79	Luzula parviflora	Juncaceae
80	Lycopodium annotinum	Lycopodiaceae
81	Lycopodium clavatum	Lycopodiaceae
82	Lycopodium complanatum	Lycopodiaceae
83	Mertensia paniculata	Boraginaceae
84	Mertensia paniculata ssp. paniculata	Boraginaceae
85	Minuartia stricta	Caryophyllaceae
86	Moehringia lateriflora	Caryophyllaceae
87	Moneses uniflora	Pyrolaceae
88	Nuphar lutea	Nymphaeaceae
89	Oxyria digyna	Polygonaceae
90	Oxytropis campestris	Fabaceae
91	Oxytropis campestris ssp. gracilis	Fabaceae
92	Oxytropis nigrescens	Fabaceae
93	Pedicularis labradorica	Scrophulariaceae
94	Petasites frigidus	Asteraceae
95	Petasites frigidus x hyperboreoides	Asteraceae
96	Petasites hyperboreus	Asteraceae
97	Phlox sibirica	Polemoniaceae

#	Scientific Name	Family
98	Picea glauca	Pinaceae
99	Picea mariana	Pinaceae
100	Platanthera obtusata	Orchidaceae
101	Poa alpina	Poaceae
102	Poa arctica ssp. lanata	Poaceae
103	Poa glauca	Poaceae
104	Poa palustris	Poaceae
105	Poa pratensis	Poaceae
106	Polemonium acutiflorum	Polemoniaceae
107	Polygonum alaskanum	Polygonaceae
108	Polygonum bistorta	Polygonaceae
109	Populus balsamifera	Salicaceae
110	Populus tremuloides	Salicaceae
111	Potamogeton zosteriformis	Potamogetonaceae
112	Potentilla palustris	Rosaceae
113	Pyrola asarifolia	Pyrolaceae
114	Pyrola secunda	Pyrolaceae
115	Ranunculus filiformis	Ranunculaceae
116	Ranunculus lapponicus	Ranunculaceae
117	Ribes triste	Grossulariaceae
118	Rorippa palustris	Brassicaceae
119	Rosa acicularis	Rosaceae
120	Rubus chamaemorus	Rosaceae
121	Rubus idaeus	Rosaceae
122	Salix alaxensis	Salicaceae
123	Salix alaxensis var. alaxensis	Salicaceae
124	Salix arbusculoides	Salicaceae
125	Salix barclayi	Salicaceae
126	Salix bebbiana	Salicaceae
127	Salix glauca	Salicaceae
128	Salix pulchra	Salicaceae
129	Salix scouleriana	Salicaceae
130	Saxifraga cespitosa	Saxifragaceae
131	Saxifraga tricuspidata	Saxifragaceae
132	Sedum rosea	Crassulaceae
133	Shepherdia canadensis	Eleagnaceae
134	Silene menziesii ssp. williamsii	Caryophyllaceae
135	Spiraea beauverdiana	Rosaceae
136	Stellaria crassifolia	Caryophyllaceae
137	Taraxacum sp.	Asteraceae
138	Trientalis europaea	Primulaceae
139	Trisetum spicatum	Poaceae
140	Trisetum spicatum ssp. spicatum	Poaceae
141	Vaccinium oxycoccus	Ericaceae
142	Vaccinium uliginosum	Ericaceae
143	Vaccinium vitis-idaea	Ericaceae
144	Viburnum edule	Caprifoliaceae

Appendix D: Photographs

Included as a Word file:
AppendixD_plantphotos_yerrick.doc

Appendix E: Field Data Forms

Included as an Adobe file:
AppendixE_plantfieldforms_yerrick.pdf

9.3.3. – LITERATURE REVIEW AND FIELD REPORT: HYDROLOGY BASELINE STUDY

LITERATURE REVIEW AND FIELD REPORT: HYDROLOGY BASELINE STUDY YERRICK CREEK HYDROELECTRIC PROJECT, TOK, ALASKA

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APPENDICES

1.0 INTRODUCTION

The hydroelectric project proposed by Alaska Power and Telephone (AP&T) will include an impoundment in Yerrick Creek just below the confluence of two tributaries with Yerrick Creek (Yerrick Creek Diversion Sample Site, Figure 1.1). A penstock will be constructed to carry water to a powerhouse to be constructed near the old pipeline corridor (Yerrick Creek Discharge Sample Site). A separate diversion and powerhouse system may be constructed on Cathedral Rapids Creek No. 1 as well. The impoundment would be in the approximate location of Cathedral Rapids No. 1 Diversion Sample Site (Figure 1.1). Power generated from the hydroelectric project would power Tok and surrounding communities during summer months and possibly supply some portion of the power supply for a larger portion of the year.

Figure 1.1. Sample locations on Yerrick Creek and Cathedral Rapids Creek No. 1 (Google Earth, 2008).

The purpose of the hydrology and water quality studies presented herein is to establish a preliminary baseline necessary for the permitting process. Additional baseline studies may be required (see Section 4.0 for recommended further action). Additional flow studies are being

conducted by AP&T to determine the potential power output and feasibility of the hydroelectric project.

2.0 HYDROLOGY AND WATER QUALITY MONITORING

2.1 BACKGROUND

Hydroelectric project background

The Yerrick Creek hydroelectric project, as described by AP&T is to include: (1) a small diversion structure with intake; (2) a 48-inch diameter, 15,000-foot long penstock; (3) a powerhouse with the capacity of 2 to 3 MW; (4) a 0.5-mile long buried and 22-mile overhead transmission line to connect an existing power grid; and (5) appurtenant facilities.

Hydrology background from nearby USGS stations

Water quality data were collected from Yerrick Creek at USGS station 632257143353500, which is located in Yerrick Creek at the highway crossing (63°22’57” N; 143°35’35” W; NAD27). Data were collected between 1949 and 1956. No flow data are available, but a total of 28 physical and chemical parameters were recorded, most of which are summarized in tables below (Table 2.1, 2.2, 2.3, and 2.4; USGS, 2008).

Table 2.1. Yerrick Creek USGS water quality measurements (USGS, 2008).

	Temperature	**Specific Conductance**	**pH**	**Carbon Dioxide**	**Color**
	°C	µS/cm	pH units	mg/L	PtCo units, filtered
7/21/1949	7	95	6.6	14	--
6/22/1951	--	164	7	8.2	10
6/4/1952	--	109	6.8	9.6	25
2/17/1953	0	254	7.5	4.5	5
5/13/1953	0	130	7.1	5.6	25
5/18/1955	--	107	7	6.1	50
9/20/1955	--	161	7.8	1.5	5
5/11/1956	--	105	7	6.4	--

Table 2.2. Yerrick Creek USGS water quality sampling – alkalinity and hardness (USGS, 2008).

	Acid neutralizing capacity	**bicarbonate**	**hardness**	**non-carbonate hardness**
	mg/L as CaCO3	mg/L	mg/L as $CaCO_3$	mg/L as $CaCO_3$
7/21/1949	29	35	39	10
6/22/1951	42	51	65	23
6/4/1952	31	38	50	19
2/17/1953	72	88	120	49
5/13/1953	36	44	60	24
5/18/1955	31	38	46	15
9/20/1955	50	61	68	18
5/11/1956	33	40	45	12

Table 2.3. Yerrick Creek USGS water quality sampling – metals, filtered (USGS, 2008).

	Calcium	Magnesium	Sodium	Potassium	Iron
	mg/L, filtered	mg/L, filtered	mg/L, filtered	mg/L, filtered	µg/L, unfiltered
7/21/1949					
6/22/1951	21	3.1			20
6/4/1952	15	3.1	1.8	2.1	70
2/17/1953	39	5.6	2.8	4.3	10
5/13/1953	19	3.1	1.2	2.3	40
5/18/1955	15	2.2	1.2	2.4	170
9/20/1955	22	3.2	2.3	2.8	0
5/11/1956	14	2.5	1.6	2	

Table 2.4. Yerrick Creek USGS water quality sampling – nutrients, ions, and residuals (USGS, 2008).

	Nitrate	**Sulfate**	**Chloride**	**Fluoride**	**Silica**	**Residue, sum of constituents**	**Residue**
	mg/L as N, filtered	mg/L, filtered	mg/L, filtered	mg/L, filtered	mg/L filtered	mg/L, filtered	tons/acre-foot, filtered
7/21/1949	0.2	15	0.5		4.3		
6/22/1951	0.2	27	0.5	0.2	7.3	88	0.12
6/4/1952	0.38	20	1	0.1	5.7	69	0.09
2/17/1953	0.34	58	0.5	0.1	8.4	164	0.22
5/13/1953	0.25	25	0.5	0.2	3.9	78	0.11
5/18/1955	0.47	20	0.5	0	4.4	66	0.09
9/20/1955	0.16	26	0	0	11	98	0.13
5/11/1956		17	1			58	0.08

Data are also available from USGS station 15476000 on the Tanana River just downstream of the confluence of Cathedral Rapids Creek #1 with the Tanana River. The drainage area sampled by this station is 8,550 square miles. Data were collected at this site from 1953 through 1990, including discharge, peak stream-flow, and water quality information. The record of daily mean discharge is shown in Figure 2.1. Peak flows are shown in Figure 2.2 and the distribution of peak flows among the summer months is shown in Figure 2.3 (USGS, 2008).

Nine of the ten highest daily discharge measurements for USGS 154760000 occurred between July 19th and 27th in 1988. Of the 50 highest daily discharge measurements, 27 occurred in July, 18 occurred in August, and 5 occurred in June, suggesting that summer rains cause the highest flows rather than snowmelt and breakup. If, however, the month of July 1988 is removed from the record, four of the top ten daily discharges occurred in August and three occurred in each June and July. Likewise, excepting July 1988, 29 of the 50 highest daily discharges occurred in August, 14 occurred in July, and 7 occurred in June.

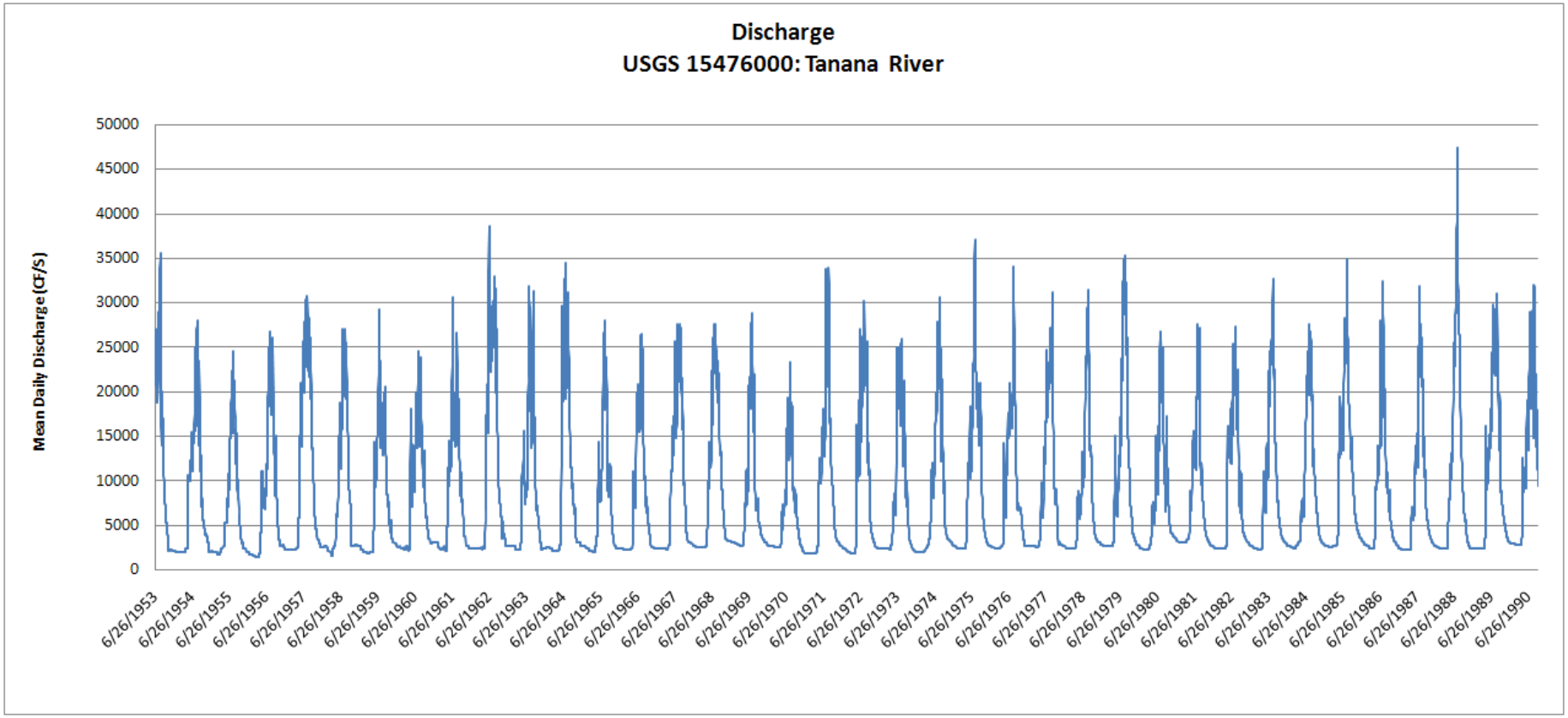


Figure 2.1. Tanana River mean daily discharge, 1953 through 1990 (USGS, 2008).

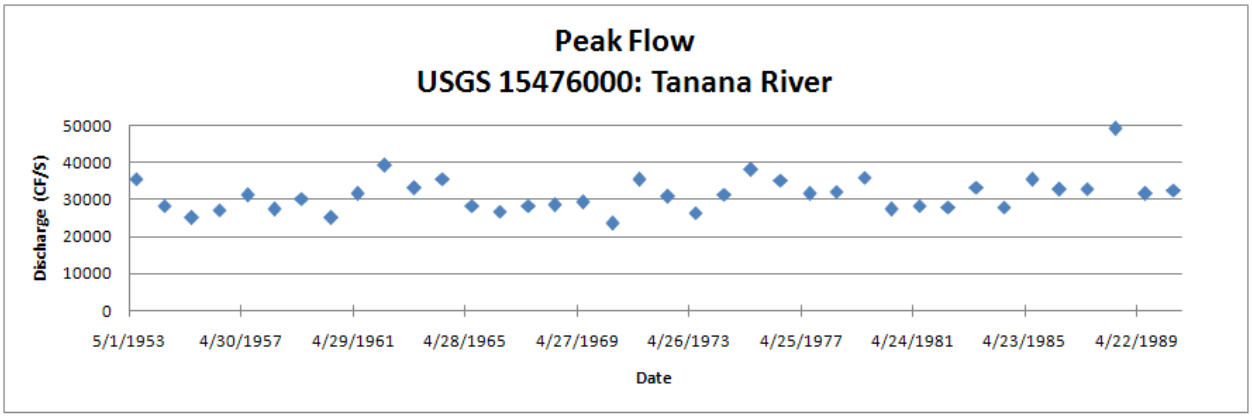


Figure 2.2. Tanana River peak flow (USGS, 2008).

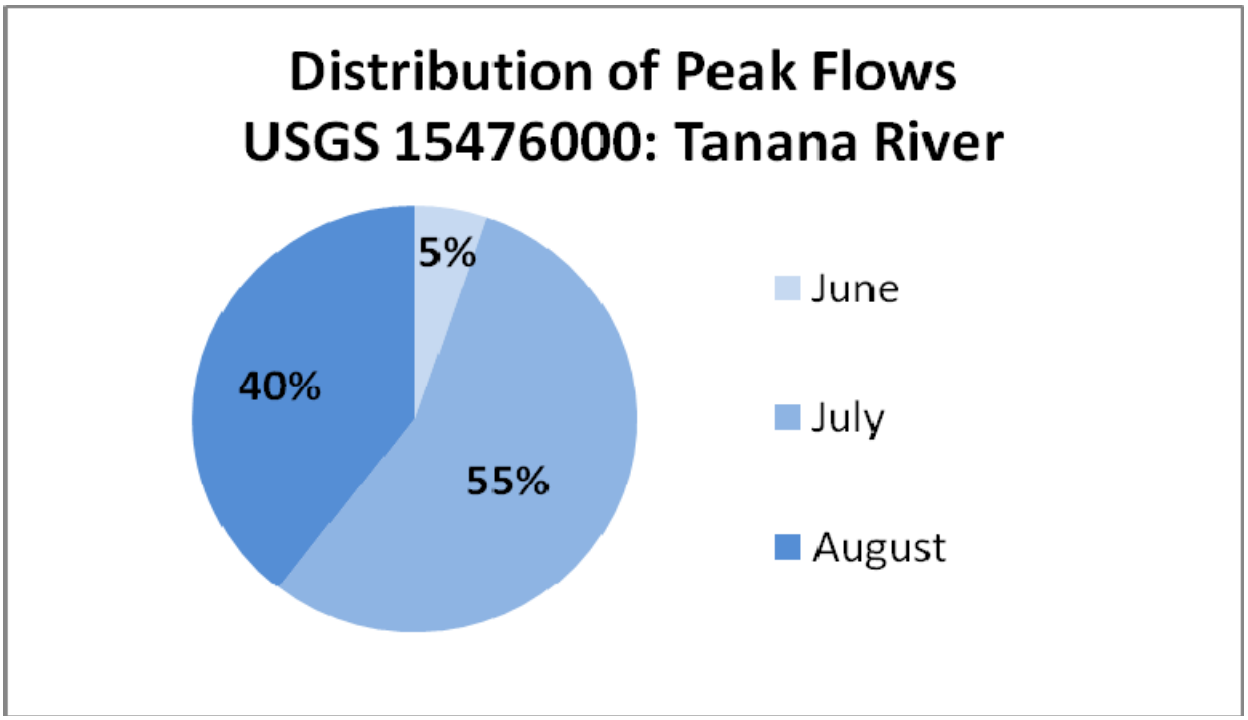


Figure 2.3. Tanana River peak flow distribution (USGS, 2008).

Water quality data for USGS 15476000 on the Tanana River include 101 parameters. A portion of the data is presented below and the remainder is available from the USGS at http://alaska.usgs.gov/science/water/index.php. Data collected only once or several times were not included in the table below.

Table 2.5. Summary of water quality data from USGS 15476000 on the Tanana River (USGS, 2008).

Parameter, units	Maximum	Minimum	Count	Mean	Median
Temperature, °C	16.5	0	105	6.3	6.5
Color, filtered, PtCo units	60	0	203	10.4	5
Specific Conductance, µS/cm	448	160	222	233.0	220
pH	8.4	6.6	212	7.7	7.7
Carbon Dioxide, mg/L	68	0.7	212	5.4	3.7
Acid neutralizing capacity, mg/L as CaCO3	203	61	212	98.3	92
Bicarbonate, mg/L	247	74	212	119.7	112
Nitrate, mg/L as Nitrogen	0.77	0	206	0.17	0.14
Phosphate, mg/L	0.16	0	52	0.019	0.01
Hardness, mg/L as CaCO3	230	72	207	110.4	100
Non-carbonate Hardness, mg/L as CaCO3	30	0	207	12.2	12
Calcium, filtered, mg/L	62	20	207	32.8	31
Magnesium, filtered, mg/L	19	2.9	207	6.97	6.2
Sodium, filtered, mg/L	11	3.3	208	5.84	5.65
Potassium, filtered, mg/L	3.1	0.1	208	1.48	1.5
Chloride, filtered, mg/L	7	0.4	208	3.05	3
Sulfate, filtered, mg/L	45	11	208	21.2	20
Fluoride, filtered, mg/L	1.2	0	205	0.148	0.1
Silica, filtered, mg/L	44	7.2	208	11.8	11
Residue on evaporation, filtered, mg/L	205	108	28	132.6	128
Residue, sum of constituents, filtered, mg/L	310	95	207	143.1	136
Residue, dissolved, tons per day	10500	666	206	4769.2	4680
Residue, filtered, tons per acre foot	0.42	0.13	207	0.196	0.19
Orthophosphate, unfiltered, mg/L as phosphorous	0.05	0	52	0.006	0
Nitrate, filtered, mg/L	3.4	0	206	0.76	0.6
Manganese, unfiltered, µg/L	100	0	140	1.86	0
Iron, unfiltered, µg/L	620	0	192	64.9	30
Suspended sediment, mg/L	3460	15	106	976.9	908
Suspended sediment, tons/day	326000	81	104	52024	28300

USGS station 15475997 is located on Cathedral Rapids Creek No. 1, but no data are available from this station. This station is located on Cathedral Rapids Creek No. 1 approximately 0.4 miles above (south of) the highway crossing (63°22’45”N; 143°44’00”W; NAD27) and has a drainage area of 8.83 square miles (USGS, 2008).

Detectable levels of antimony, arsenic, nitrates/nitrites, barium, chromium, and fluoride have been found in public drinking water systems in the Tok basin (ADEC, 2008). The only inorganic contaminant exceedance of maximum contaminant levels for drinking water has been for nitrates (ADEC, 2008).

Peak Flow Estimates

Yerrick Creek and Cathedral Rapids Creek No. 1 are within region 6 as described by USGS Water-Resources Investigations Report 03-4188 (Curran et al., 2003). As such, the equations for peak stream-flow presented by Curran et al. (2003) include drainage area, area of lakes and ponds (storage), and area of forest. Drainage areas are shown in Figure 2.4. Model input parameters for each stream are shown in Table 2.6. Peak flows are calculated for the proposed diversion points in each drainage. Peak flows for each recurrence interval are presented in Table 2.7.

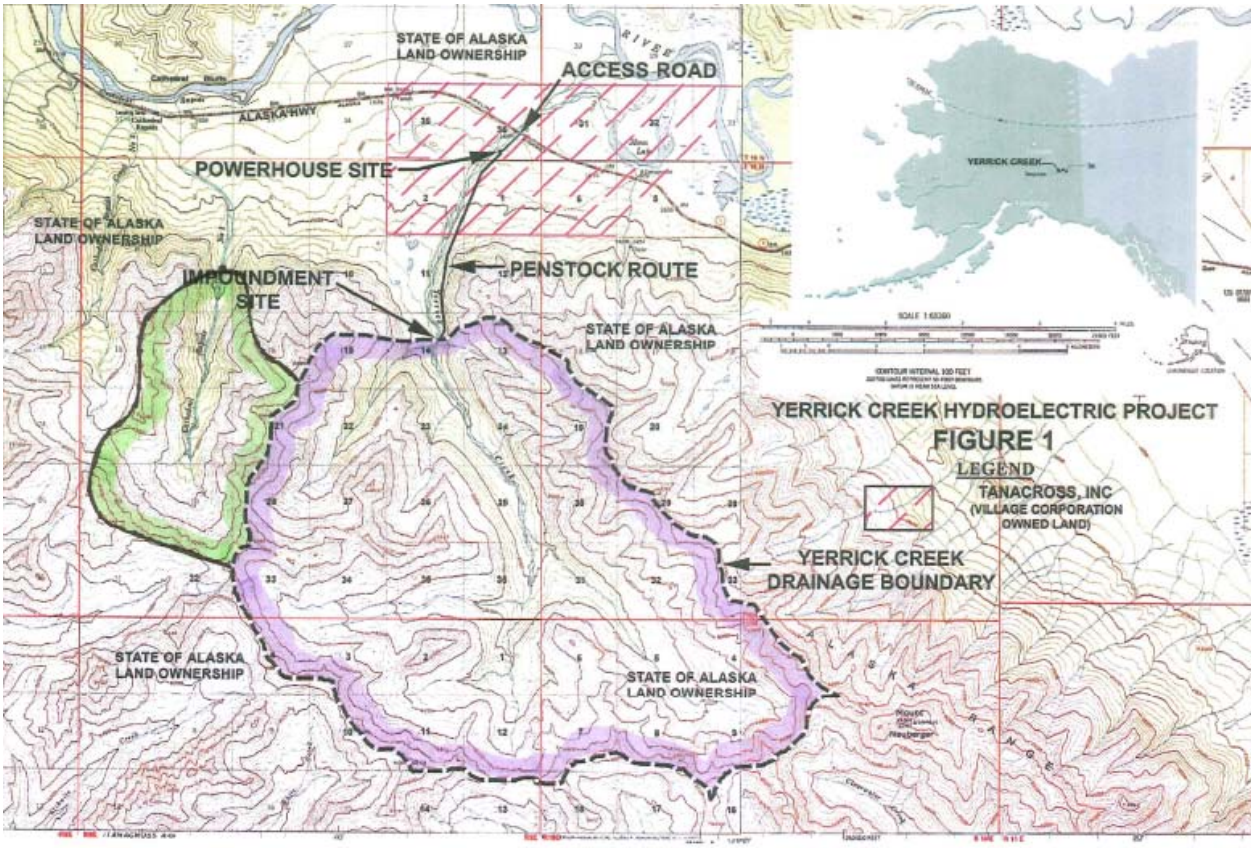


Figure 2.4. Drainage areas for proposed impoundment sites.

Table 2.6. Model input parameters

	Yerrick Creek	Cathedral Rapids Creek No. 1
Drainage Area (square miles)	30	6
Area of lakes and ponds (percent)	0	0
Area of forest (percent)	0	0

Table 2.7. Peak flows and recurrence intervals for Yerrick Creek and Cathedral Rapids Creek #1.

Recurrence Interval (yr)	Yerrick Creek Peak Streamflow (CF/S)	Cathedral Rapids Creek #1 Peak Streamflow (CF/S)
2	1102	262
5	1575	402
10	1916	508
25	2373	652
50	2728	767
100	3093	887
200	3468	1012
500	3985	1186

The model of Curran et al. (2003) was used to estimate peak flows in the upper and lower gage sites of Mack (1987, 1988) at Rhoads-Granite Creek, which is approximately 7 miles east of Donnelly Dome. Input values were a basin area of 32.2 square miles, zero percent storage (lakes and ponds), and 0.5 percent forest for the upper gage site and 81.2 square miles of drainage basin, 5.5 percent storage, and 42 percent forest for the gaging site at the road. Drainage area and percentage forested were extracted from Mack (1987, 1988) and percentage lakes and ponds was selected so as to minimize the difference from Mack's output (loss to groundwater and distributaries are complexities not accounted for in the model of Curran et al. 2003). Output was compared to the model output produced by Mack (1987, 1988) and the average absolute value of the percentage errors (assuming Mack's model output is the best estimate of actual) was approximately 25 percent for each gaging site.

The data from Mack (1987, 1988) was not used to refine or calibrate the model of Curran et al. (2003) for the Yerrick Creek or Cathedral Rapids Creek No. 1 because Mack's output was model output based on limited data and a complex watershed. Since region 6, the region for which the

model equations were designed, is quite large, more local data for refinement of the model to a smaller region would be desirable and the Mack studies may provide some significant considerations which may be applicable at Yerrick and Cathedral Rapids Creeks. Some conditions from Rhoads-Granite Creek which may be found at Yerrick Creek and Cathedral Rapids Creek No. 1 are: (1) significant loss to groundwater due to permeable glacial deposits; (2) abandoned channels which may serve as distributaries at high water; and (3) seasonal modeling complexity based on snowmelt and frost conditions.

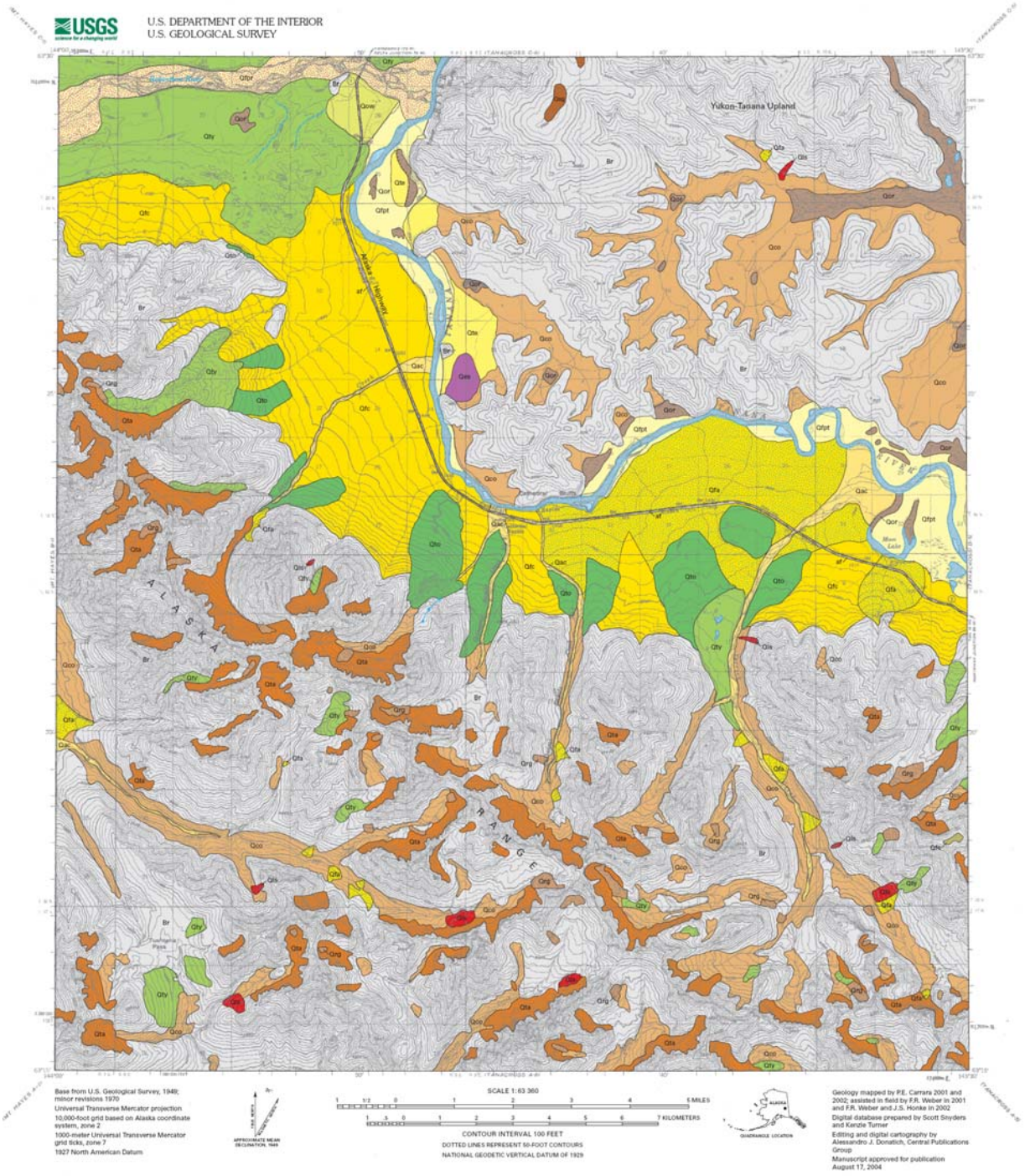
Local geology

According to Carrara (2004), the map units that occur in the Yerrick Creek drainage include Qac, Qco, Ata, Qfa, Qty, Qto, Qrg, and Qls (Figures 2.5, 2.6). Cathedral Rapids Creek #1 drains an area that includes map units Qac, Qfc, Qto, Qfa, Qrg, and Qta. These map units include alluvial, colluvial, glacial, and periglacial deposits. Biotite gneiss and schist are among the rock types found in the surface geology of the area.

Carrara (2004) notes that areas underlain by the Qac unit are subject to floods and debris flows. The Yerrick Creek bridge abutment was damaged by flooding in August 1997 (Carrara, 2004; Figure 2.6). With regards to map unit Qto, Carrara (2004) notes that in the Yerrick Creek and Cathedral Rapids Creek No. 1 areas the unit forms hummocky end moraines extending out from the base of the Alaska Range.

Bedrock and surficial geology units mapped by Holmes (1965) within the Yerrick Creek and Cathedral Rapids Creek No. 1 drainages (Figure 2.7) include Qc (colluvium – mixtures of rubble, talus, alluvium, and loess), Qag (flood-plain gravelly alluvium), Qt (talus – angular boulders), Qdgl (moraine deposits from Donnelly glaciations), Qdm (moraine deposits from Delta glaciations), Qg (fan-apron and alluvial-fan deposits – mostly gravel; gravel from local sources), pCb (Birch Creek Schist – schist, gneiss, quartzite, and amphibolites), Qdf (glacio-fluvial deposits), and Qts (stream-terrace deposits – mostly silt and sand).

The Birch Creek Schist is the predominant bedrock geologic form in the study area as mapped by Holmes (1965). The Precambrian or early Precambrian Birch Creek Schist is a thick group extensive in area resulting from one or more periods of high grade regional metamorphism (Holmes, 1965). Schist (gray quartz-mica; chloritic; and graphitic), gneiss (gray or light brown biotite; gray hornblende; and hornblende-biotite), quartzite (white to light brown or gray or greenish gray), and amphibolites (black) are the main rock types in the mapped area (Holmes, 1965).



SURFICIAL GEOLOGIC MAP OF THE TANACROSS B-6 QUADRANGLE, EAST-CENTRAL ALASKA
By
Paul E. Carrara
2004

Figure 2.5. Surficial geologic map of the Yerrick Creek Hydroelectric Project area (Carrara, 2004)

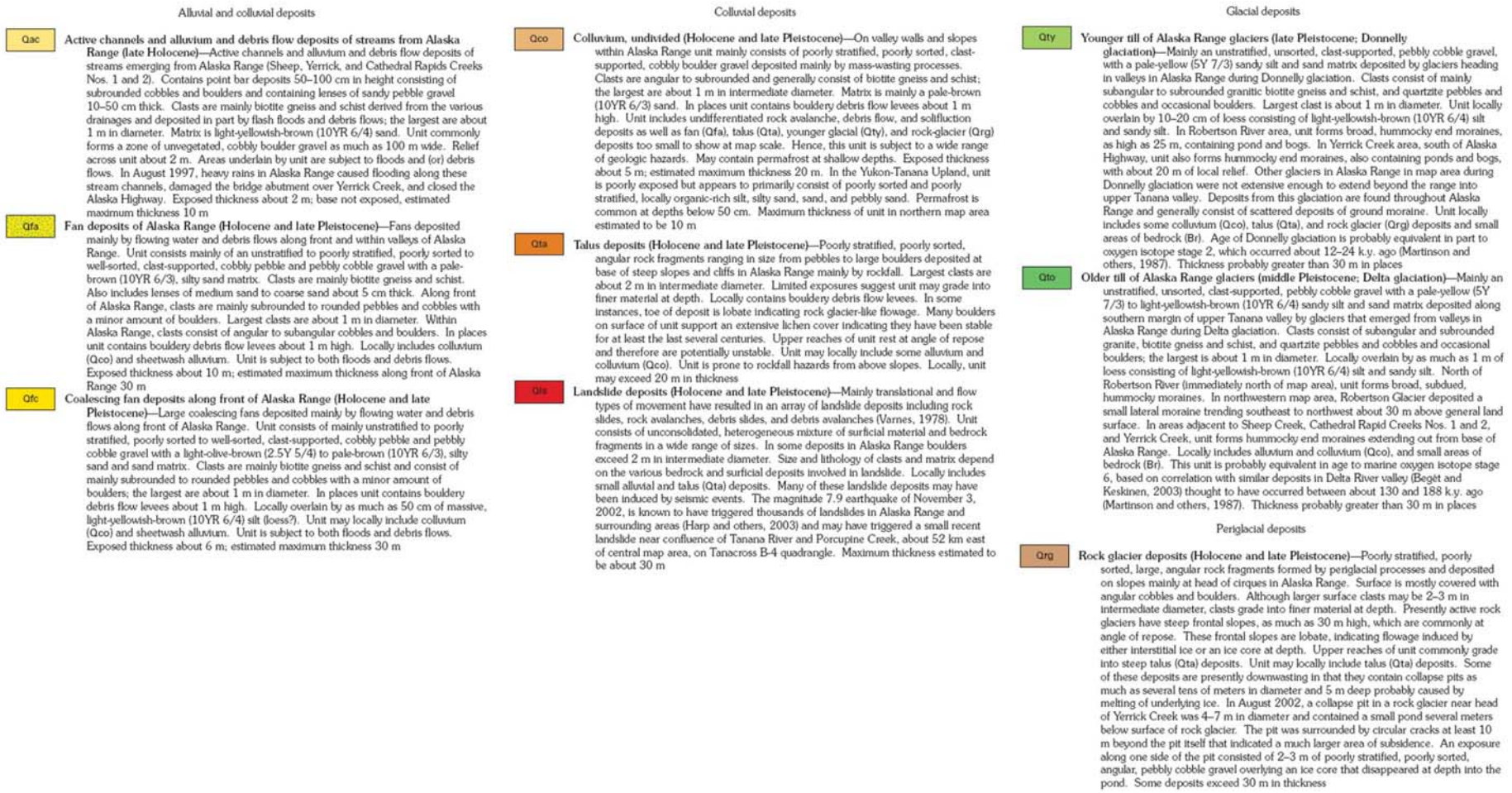


Figure 2.6. Key to geologic map (Figure 2.5).

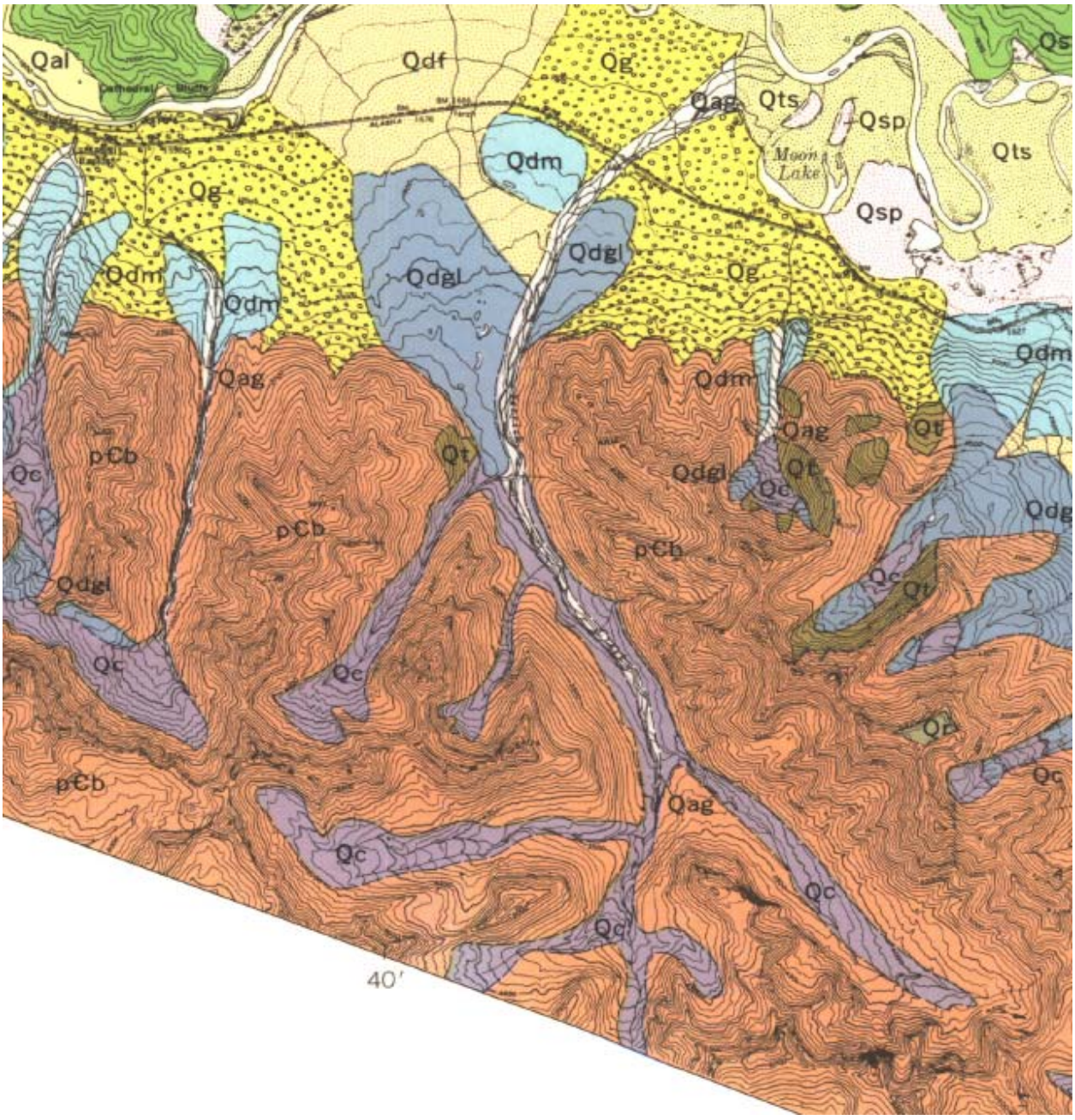


Figure 2.7. Bedrock and surficial geology (Holmes, 1965).

2.2 SAMPLE LOCATIONS

The two streams directly impacted by the Yerrick Creek Hydroelectric Project are Yerrick Creek and Cathedral Rapids Creek No. 1. Yerrick Creek has the larger drainage basin, which includes approximately eight tributaries identifiable on the 1:63,360 scale USGS map. Two small streams merge to form the headwaters of Cathedral Rapids Creek No. 1. Both Cathedral Rapids Creek

No. 1 and Yerrick Creek drain to the north into the Tanana River. The proposed diversions, as of September 2008, would discharge into Yerrick Creek downstream (north) of the old pipeline corridor) and at a separate downstream location on Cathedral Rapids Creek No. 1.

2.3 WATER QUALITY PARAMETERS

The water quality parameters measured are listed in Table 2.8. The physical and chemical parameters include alkalinity, conductivity, dissolved oxygen, hardness (calculated), pH, settleable solids, total dissolved solids, total suspended solids, temperature, and turbidity. Two other general parameters commonly measured are chloride and fluoride. Chloride is necessary for performing an ion balance. Fluoride is included because it is required by the ADEC. The nutrient parameters include nitrate, phosphate, and sulfate. The remaining parameters in Table 2.8 are metals and trace elements. Hardness is calculated from measured parameters. Analysis of all parameters will be on unfiltered samples, so the results are total, not dissolved concentrations

Table 2.8. Surface water quality parameters.

Laboratory				
Antimony	Chloride	Magnesium	Sodium	Total Dissolved Solids
Arsenic	Chromium	Manganese	Sulfate	Total Suspended Solids
Barium	Copper	Mercury	Zinc	Weak Acid Dissociable Cyanide
Beryllium	Fluoride	Potassium		
Cadmium	Iron	Selenium		Total Cyanide
Calcium	Lead	Silver		
Field				
Flow	pH	Conductivity	Temperature	Turbidity
Alkalinity	Nitrate	Color	Settleable Solids	Dissolved Oxygen
Orthophosphate	Nitrite			

2.4 METHODOLOGY

Field and laboratory water quality parameters were measured in accordance with the U.S. Environmental Protection Agency manual Methods for Chemical Analysis of Water and Wastes or Standard Methods for the Examination of Water and Wastewater. Open channel flow was measured using Model 1205 Price type “mini” current meter. In-situ measurements of conductivity, temperature, pH and dissolved oxygen were accomplished with YSI 63 and YSI 95 meters. Color, turbidity, and alkalinity were measured in the field within 24 hours of sample collection using the Hach DR890 Colorimeter, Hach 2100P Turbidimeter, and Hach digital titrator. A table showing analytes and methods is included in Appendix B.

SGS Environmental Services, Inc. was the analytical laboratory selected for the monitoring program. SGS Environmental Services, Inc. is an ADEC Certified Chemistry Lab. Duplicate samples were not collected as part of this sampling effort. Laboratory quality assurance and quality control measures and results are shown in the laboratory data report in Appendix B.

3.0 RESULTS

Measurements and samples were taken at 3 locations. The sample sites, shown in Figure 3.1, are located at:

- The approximate diversion site for Yerrick Creek, which is also the transducer location as of September 2008;
- The approximate diversion site for Cathedral Rapids Creek No. 1; and
- A downstream site near the old pipeline corridor's intersection with Yerrick Creek, which was intended to be at the discharge or re-entry site for water diverted from Yerrick Creek. The discharge point will actually be downstream of the sample site.

The Yerrick Creek diversion site is also the location where AP&T personnel have conducted flow studies and are presently recording stage data on a continuous basis with a permanently installed pressure transducer. The data collected by AP&T is not included in this report, but should be comparable based on location.

The Yerrick Creek downstream site is also in immediate vicinity of field work conducted by Denali-The Alaska Gas Pipeline personnel. Data from their efforts, if made available, should be comparable based on location.

Physical and chemical measurements made in the field are presented in Table 3.1. Laboratory analysis results are shown in Table 3.2. Hardness (Table 3.2) was calculated from the calcium and magnesium concentrations. Iron, zinc, and manganese could have been included, but were all either not detected, or detected at levels below the practical quantitation limit and are therefore minor contributors to total hardness.

Yerrick Creek and Cathedral Rapids Creek No. 1 are clear, oligotrophic (low nutrient levels), and well oxygenated. The moderately high pH for surface water suggests contact with some kind of carbonate rock within the drainage.

Laboratory results confirm that Yerrick Creek and Cathedral Rapids Creek No. 1 have minimal levels of most dissolved substances.

Laboratory quality assurance and quality control information were reviewed. No problems were identified that would affect data quality. For additional details, see the case narrative on page 2 of the laboratory data report in Appendix B.

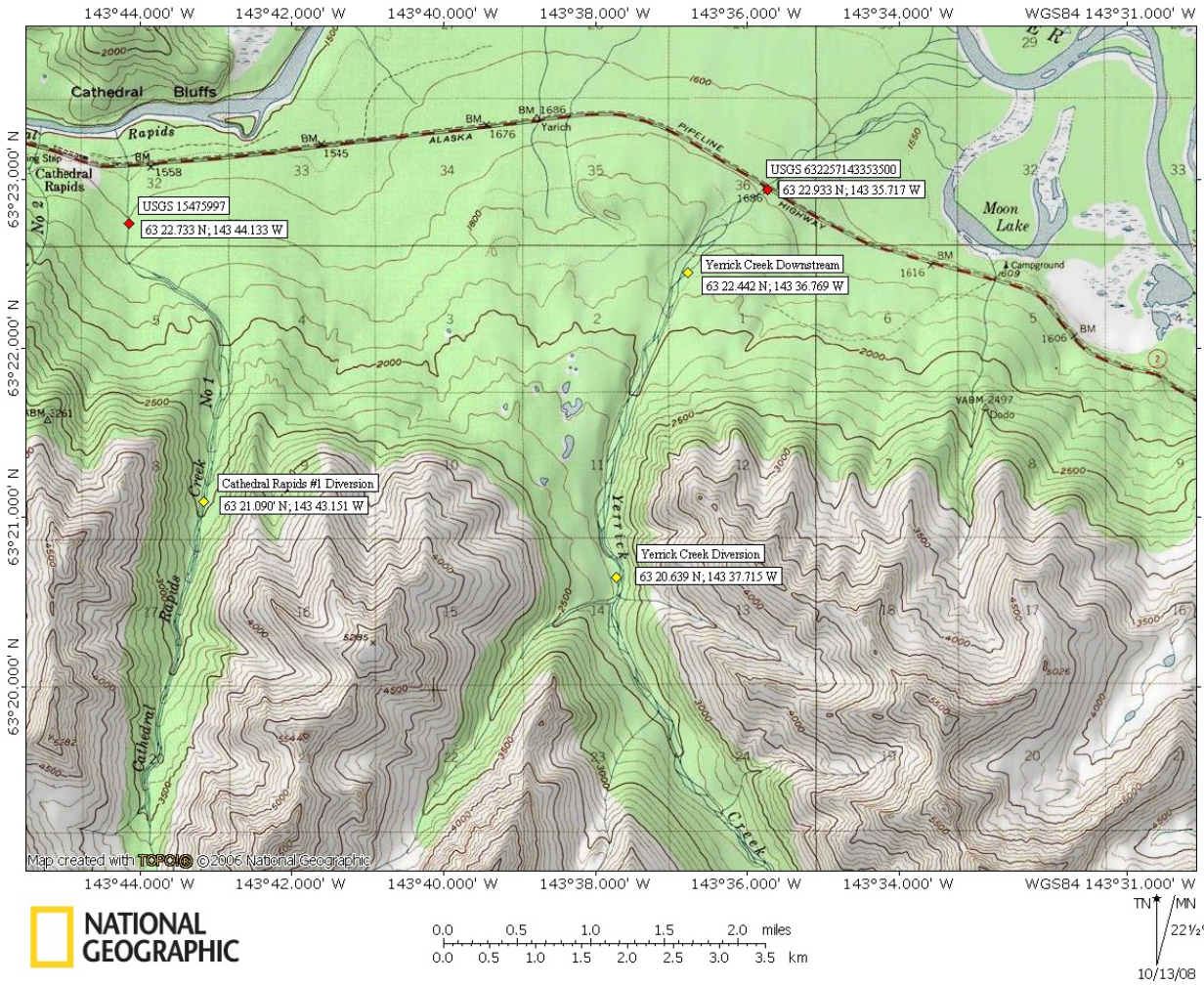


Figure 3.1. Sample site locations.

Table 3.1. Field measurements.

Parameter	Yerrick Creek Diversion	Yerrick Creek Downstream Site	Cathedral Rapids Creek Diversion
Latitude	63° 20.639' N	63° 22.442'	63° 21.090' N
Longitude	143° 37.715' W	143° 36.769	143° 43.151' W
Elevation (feet)	2272	1856	2455
Width (feet)	44	51.5	18.5
Discharge (CF/S)	110	99	27
Temperature (°C)	4.5	6.2	5.0
pH	8.01	8.14	8.18
Specific Conductance (µS)	260	277	384
Dissolved Oxygen (mg/L)	16.02	18.51[1]	12.39
Settleable Solids (mL/L)	< 0.1	< 0.1	< 0.1
Alkalinity (mg/L as $CaCO_3$)	57.6	64.0	80.4
Color (PtCo units)	4	6	0
Turbidity (NTU)	0.91	0.89	0.70
Nitrate-N (mg/L)	0.01	0.03	0.01
Nitrite-N (mg/L)	0.002	0.002	0.002
Orthophosphate (mg/L)	0.18	0.19	0.21

[1]Whitewater – supersaturated.

Table 3.2. Laboratory analyses.

Parameter	Units	Yerrick Creek Diversion	Yerrick Creek Downstream Site	Cathedral Rapids Creek Diversion
Sample ID		AP&T 01	AP&T 03	AP&T 02
Sample Date/Time		9/03/08 12:27	9/03/08 17:50	9/03/08 15:05
Antimony	ug/L	0.621 J	0.454 J	< 0.310
Arsenic	ug/L	< 1.50	< 1.50	< 1.50
Barium	ug/L	32.2	31.8	44.1
Beryllium	ug/L	< 0.500	< 0.500	< 0.500
Cadmium	ug/L	< 0.600	< 0.600	< 0.600
Calcium	ug/L	43500	42700	57600
Chromium	ug/L	< 1.20	< 1.20	< 1.20
Copper	ug/L	< 1.80	< 1.80	< 1.80
Iron	ug/L	< 310	< 310	< 310
Lead	ug/L	< 0.310	< 0.310	< 0.310
Magnesium	ug/L	7880	7790	12900
Manganese	ug/L	0.859 J	0.907 J	1.08 J
Mercury	ug/L	< 0.0620	< 0.0620	< 0.0620
Potassium	ug/L	3290	3330	3660
Selenium	ug/L	< 0.620	< 0.620	< 0.620
Silver	ug/L	< 0.620	< 0.620	< 0.620
Sodium	ug/L	2400	2460	3250
Zinc	ug/L	< 7.80	< 7.80	< 7.80
Chloride	mg/L	0.0880 J	< 0.0310	0.0800 J
Fluoride	mg/L	0.0750 J	0.0870 J	0.049 J
Sulfate	mg/L	81.8	81.0	119
Total Cyanide	mg/L	0.0022 J	< 0.0015	0.0017 J
Weak Acid Dissociable Cyanide	mg/L	< 0.0015	< 0.0015	< 0.0015
Total Dissolved Solids	mg/L	183	176	253
Total Suspended Solids	mg/L	1.00	0.400 J	0.700
Hardness (calc.: Ca, Mg)	mg/L*	141	139	197

*as $CaCO_3$

J = analyte was detected below the practical quantitation limit

Analytes that were not detected are reported as < the minimum detection limit.

4.0 RECOMMENDATIONS

As there are no chemical abnormalities that would warrant further investigation of the streams to be impacted by the hydroelectric project and flow data has been collected regularly by AP&T personnel, no additional hydrology field work should be required before permitting or construction.

5.0 CLOSURE

TPECI holds all information acquired during this investigation in the strictest confidence with AP&T. We will not release any information to any party other than Graystar Pacific Seafoods unless AP&T has notified us of their approval to do so.

6.0 LITERATURE CITED

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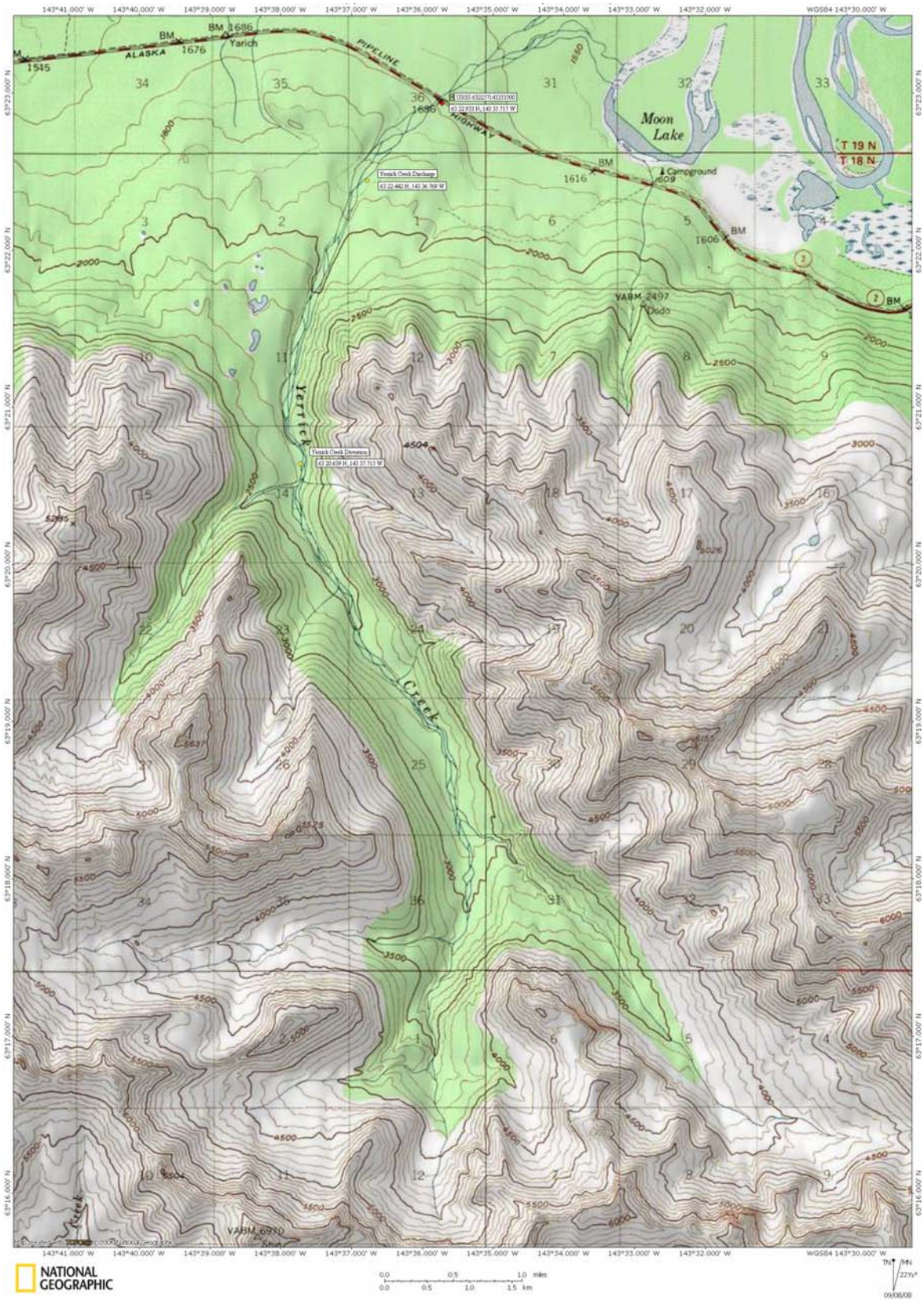
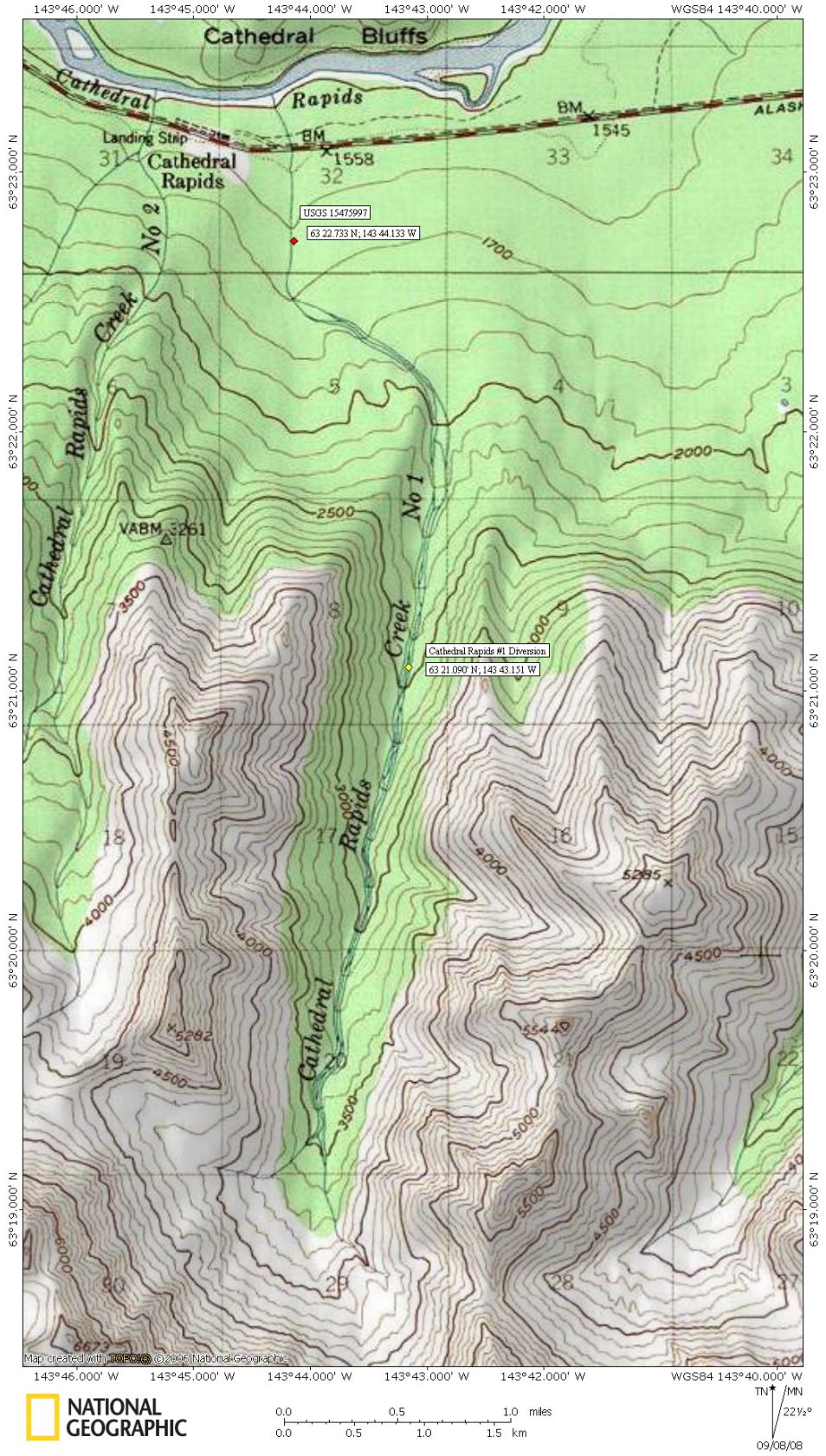
APPENDIX A

SAMPLE SITE MAPS
SITE PHOTOGRAPHS

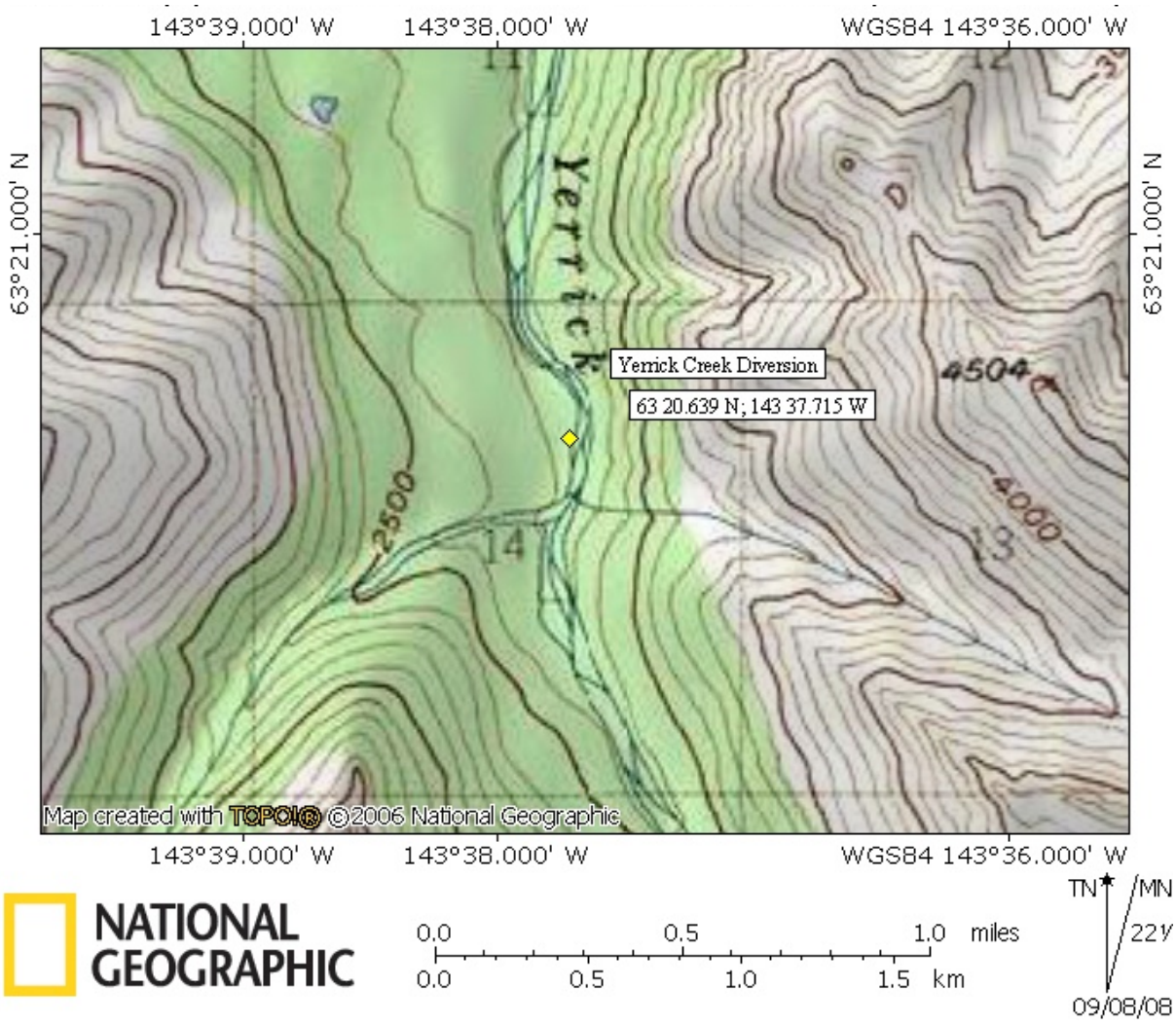
Yerrick Creek Map



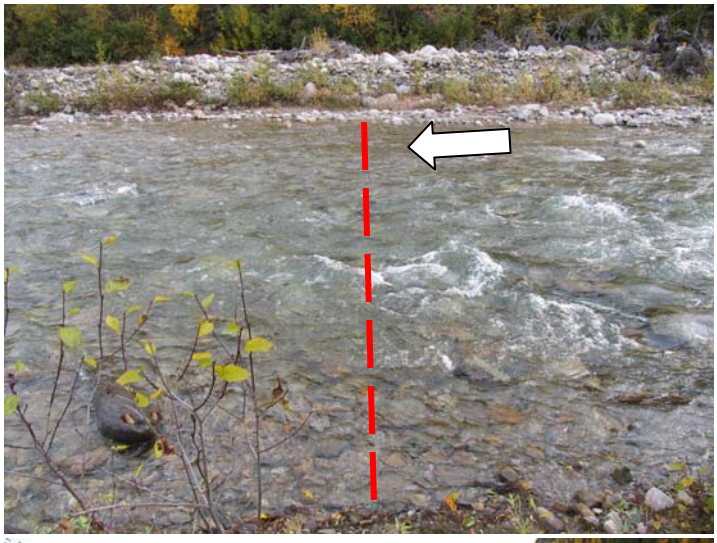
Cathedral Rapids Creek No. 1 Map



Yerrick Creek Diversion Site Map

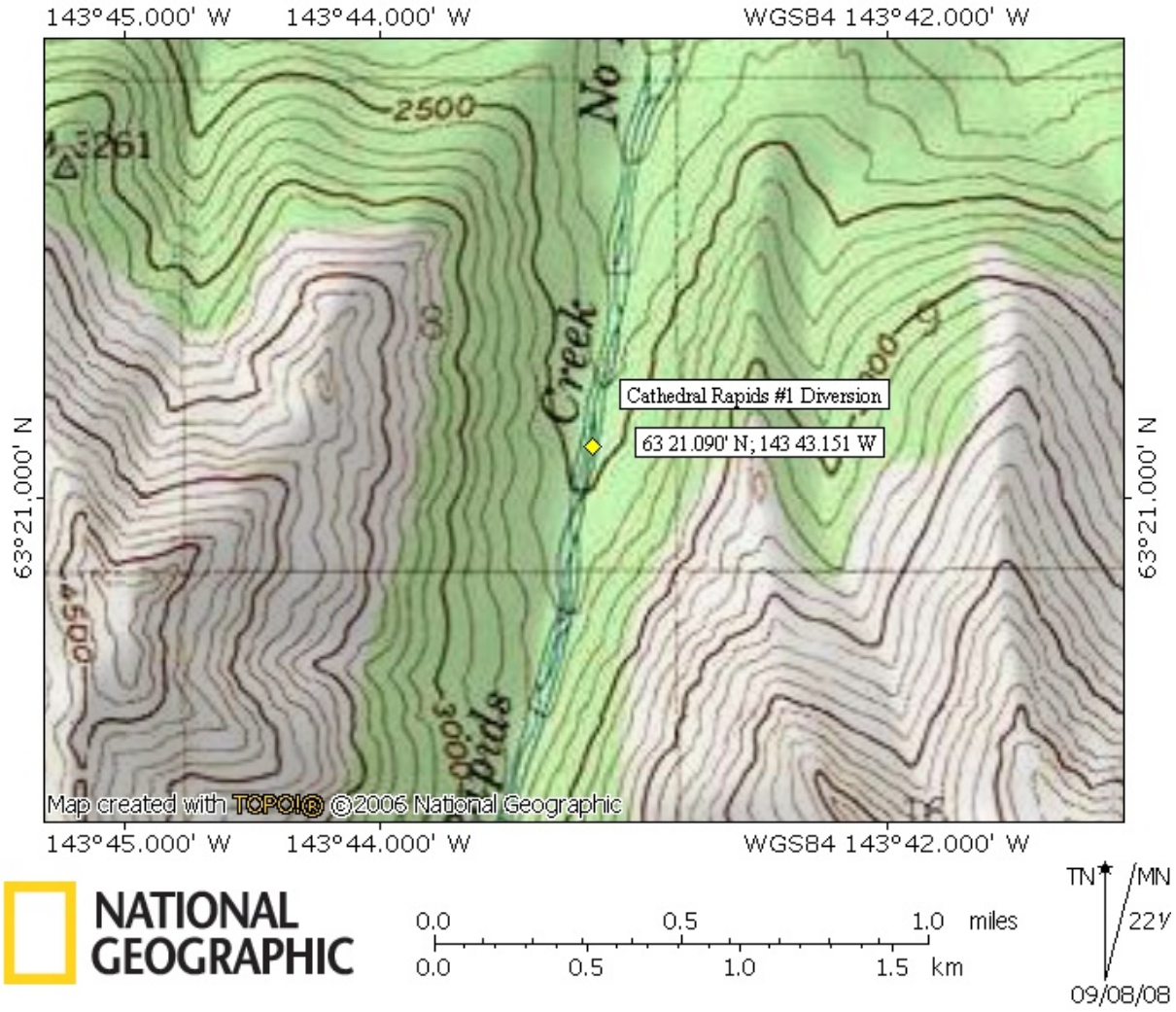


Yerrick Creek Diversion Site Photos



Upper Left: aerial view
Upper Right: site view
Middle Left: upstream view
Middle Right: downstream view
Lower Left: sediment view

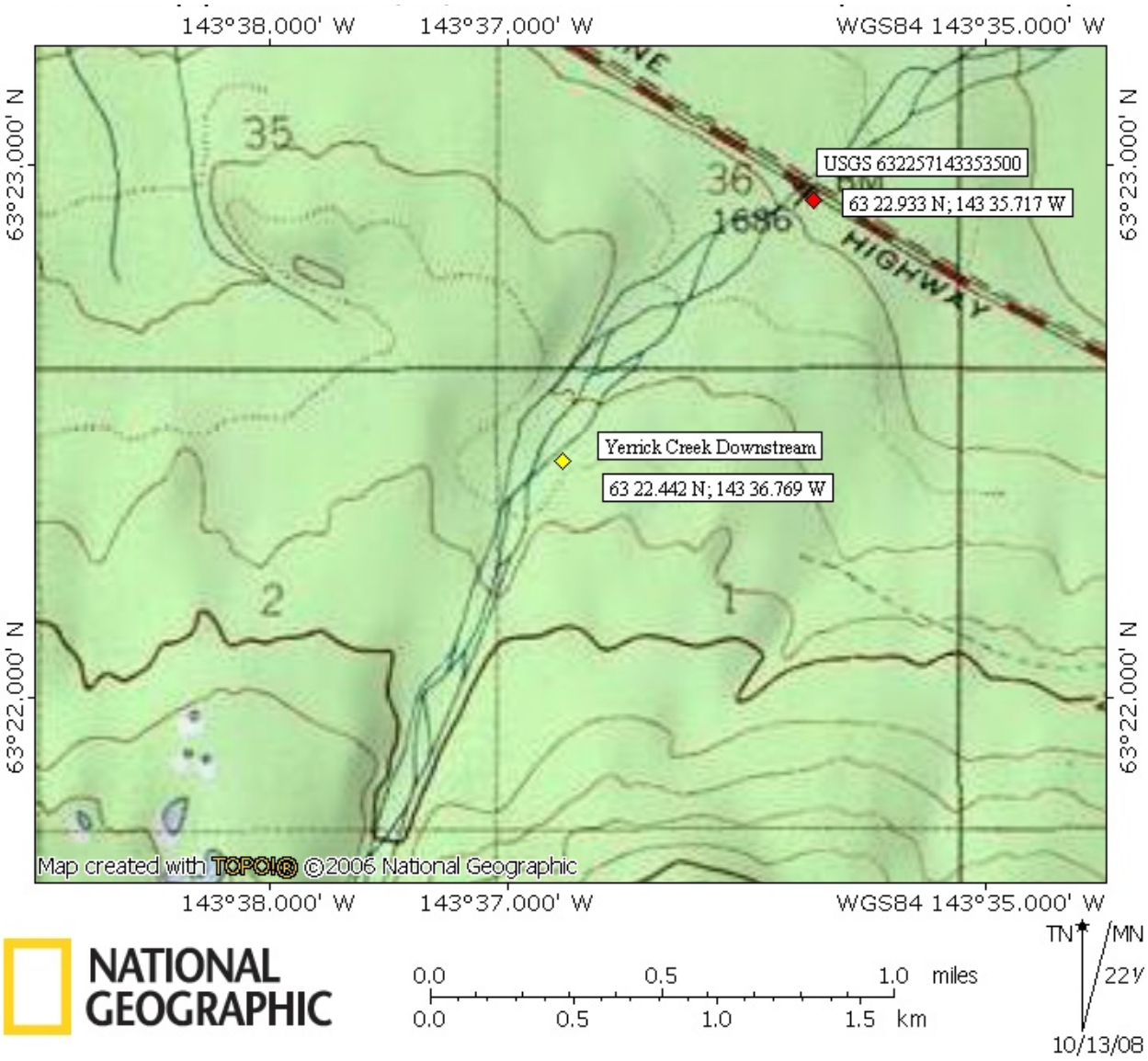
Cathedral Rapids Creek No. 1 Diversion Site Map



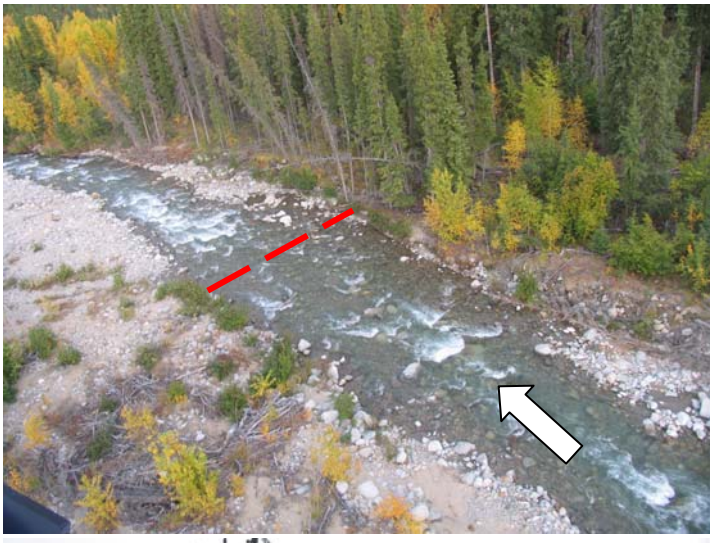
Cathedral Rapids Creek No. 1 Site Photos

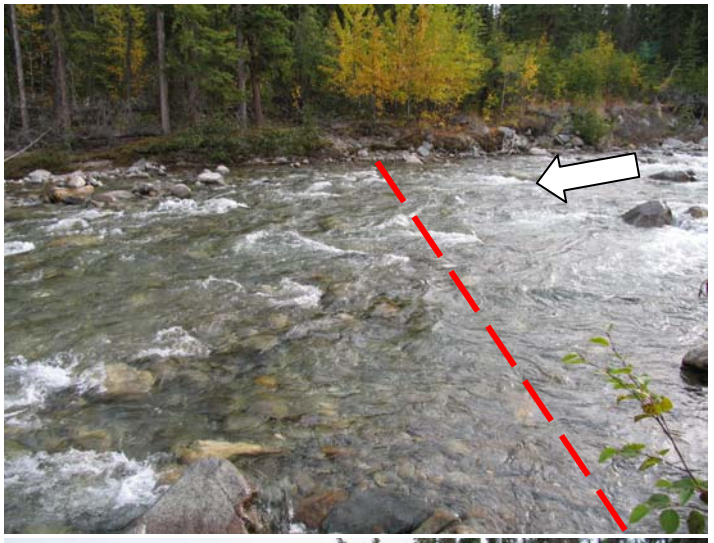
Upper Left: aerial view
Upper Right: site view
Middle Left: upstream view
Middle Right: downstream view
Lower Left: sediment view

Yerrick Creek Downstream Site Map



Yerrick Creek Downstream Site Photos





Upper Left: aerial view
Upper Right: site view
Middle Left: upstream view
Middle Right: downstream view
Lower Left: sediment view

APPENDIX B

ANALYSIS METHODS
LABORATORY DATA REPORT (SGS WO# 1084964)

WATER ANALYSIS METHODS

Method/ Instrument	Parameter	Matrix	Container	Preservative	Hold Time	Analysis Location
Metals, Total SM 6020	Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Copper Iron Lead Magnesium Manganese Potassium Selenium Silver Sodium Zinc	Water	250 or 500 mL HDPE	HNO_3; 4°C	180 days	Laboratory
EPA 7470	Mercury	Water	250 or 500 mL HDPE	HNO_3; 4°C	28 days	Laboratory
EPA 300.0	Chloride	Water	60 mL Nalgene	4°C	28 days	Laboratory
EPA 300.0	Fluoride	Water	60 mL Nalgene	4°C	28 days	Laboratory
Hach Method 8192	Nitrate	Water	N/A	N/A	ASAP	Field
Hach Method 8048 equivalent to EPA Method 365.2 and Standard Method 4500-PE	Orthophosphate	Water	N/A	N/A	ASAP	Field
EPA 300.0	Sulfate	Water	60 mL Nalgene	4°C	28 days	Laboratory
SM 4500CN-C,E	Cyanide	Water	60 or 250 mL Nalgene	NaOH; 4°C	14 days	Laboratory
SM 4500CN-I	Weak Acid Dissociable Cyanide	Water	60 or 250 mL Nalgene	NaOH; 4°C	14 days	Laboratory
SM 2540C	Total Dissolved Solids	Water	250 or 500 mL HDPE	4°C	7 days	Laboratory
SM 2540D	Total Suspended Solids	Water	1 L HDPE	4°C	7 days	Laboratory
Model 1205 Price Type “Mini” Current Meter	Flow	Water	In-Situ	N/A	N/A	In-Situ
YSI 63	pH	Water	In-Situ	N/A	N/A	In-Situ

YSI 63	Conductivity	Water	In-Situ	N/A	N/A	In-Situ
YSI 63	Temperature	Water	In-Situ	N/A	N/A	In-Situ
Hach 8203	Alkalinity	Water	N/A	N/A	ASAP	Field
Hach DR 890 Colorimeter Method 8025	Color	Water	N/A	N/A	ASAP	Field
YSI 95	Dissolved Oxygen	Water	In-Situ	N/A	N/A	In-Situ
Imhoff Cone	Settleable Solids	Water	N/A	N/A	ASAP	Field
Hach 2100P Turbidimeter EPA Method 180.1	Turbidity	Water	N/A	N/A	ASAP	Field

SGS Environmental Services
Alaska Division
Level II Laboratory Data Report

Project:	AP + T
Client:	Travis/Peterson
SGS Work Order:	1084964

Released by: Stephen C. Ede
Alaska Division Technical Director
Stephen C. Ede
2008.10.01
11:25:31 -08'00'

Contents:

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

Client Name: Travis/Peterson
Project Name: AP + T
Workorder No.: 1084964

Sample Comments

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

Lab Sample ID	Sample Type	Client Sample ID
1084964001	PS	AP + T 01
	4500 CN - Weak Acid Dissociable Cyanide - The sample duplicate RPD is outside of criteria. The difference between the parent sample and sample duplicate is less than the PQL. 4500 CN - Total Cyanide - The sample duplicate RPD is outside of criteria. The difference between the parent sample and sample duplicate is less than the PQL.	
1084964002	PS	AP + T 02
	300.0 - Fluoride - The sample DUP RPD is outside of QC criteria. Both the sample and the DUP are below the PQL.	
856689	DUP	AP + T 01(1084964001DUP)
	4500 CN - Total Cyanide - The sample duplicate RPD is outside of criteria. The difference between the parent sample and sample duplicate is less than the PQL.	
856703	DUP	AP + T 01(1084964001DUP)
	4500 CN - Weak Acid Dissociable Cyanide - The sample duplicate RPD is outside of criteria. The difference between the parent sample and sample duplicate is less than the PQL.	
857119	UDUP	AP + T 02(1084964002UDUP)
	300.0 - Fluoride - The sample and duplicate RPD is outside of QC criteria. Both results are below the PQL.	
858425	MS	BCP4-084-GW(1084873002MS)
	6020 - MS recoveries for Ca, Al, Fe, and Mg were outside of acceptance criteria. Post-digestion spike was successful.	
858426	MSD	BCP4-084-GW(1084873002MSD)
	6020 - MSD recoveries for Ca, Mn, Al and Fe were outside of acceptance criteria. Post-digestion spike was successful.	

Laboratory Analytical Report

Client: **Travis/Peterson**
329 2nd Street
Fairbanks, AK 99701

Attn: **Molly Green**
T: (907)455-7225 F:(907)455-7228
molly@tpeci.com

Project: **AP + T**

Workorder No.: **1084964**

Certification: Alaska Division Technical Director

Stephen C. Ede
2008.10.01
11:25:49 -08'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, other than the conditions noted on the sample data sheet(s) and/or the case narrative. This certification applies only to the tested parameters and the specific sample(s) received at the laboratory.

If you have any questions regarding this report, or if we can be of further assistance, please contact your SGS Project Manager.

Carmon Beene

Project Manager

Enclosed are the analytical results associated with this workorder.

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

The Laboratory certification numbers are AK971-05 (DW), UTS-005 (CS) and AK00971 (Micro) for ADEC and AK100001 for NELAP (RCRA methods: 1020A, 1311, 6010B, 7470A, 7471A, 9040B, 9045C, 9056, 9060, 8015B, 8021B, 8081A/8082, 8260B, 8270C).

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

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

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

MDL	Method Detection Limit
PQL	Practical Quantitation Limit (reporting limit).
CL	Control Limit
U	Indicates the analyte was analyzed for but not detected.
F	Indicates value that is greater than or equal to the MDL.
J	The quantitation is an estimation.
ND	Indicates the analyte is not detected
B	Indicates the analyte is found in a blank associated with the sample.
*	The analyte has exceeded allowable regulatory or control limits.
D	The analyte concentration is the result of dilution.
GT	Greater Than
LT	Less Than
Q	QC parameter out of acceptance range.
M	A matrix effect was present.
E	The analyte result is above the calibrated range.
R	Rejected
DF	Analytical Dilution Factor
JL	The analyte was positively identified, but the quantitation is a low estimation.
<Surr>	Surrogate QC spiked standard
<Surr/IS>	Surrogate / Internal Standard QC spiked standard
QC	Quality Control
QA	Quality Assurance
MB	Method Blank
LCS (D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
BMS(D)	Site Specific Matrix Spike
RPD	Relative Percent Difference
ICV	Initial Calibration Verification
CCV	Continuous Calibration Verification
MSA	Method of Standard Addition

Notes: Soil samples are reported on a dry weight basis unless otherwise specified
All DRO/RRO analysese are integrated per SOP.

SAMPLE SUMMARY

Print Date: 10/1/2008

Client Name: Travis/Peterson
Project Name: AP + T
Workorder No.: 1084964

Analytical Methods

Method Description	Analytical Method
Ion Chromatographic Analysis (W)	EPA 300.0
Mercury 7470	SW7470A/E245.1
Metals by ICP-MS	SW6020
Total Cyanide SM4500 (W) Kone Lab	SM20 4500-CN C,E
Total Dissolved Solids SM18 2540C	SM20 2540C
Total Suspended Solids SM20 2540D	SM20 2540D
Weak Acid Disassociable Cyanide Kone	SM20 4500-CN I

Sample ID Cross Reference

Lab Sample ID	Client Sample ID
1084964001	AP + T 01
1084964002	AP + T 02
1084964003	AP + T 03

Client Sample ID: **AP + T 01**
SGS Ref. #: 1084964001
Project ID: AP + T
Matrix: Water (Surface, Eff., Ground)

Collection Date/Time: 09/03/08 12:27
Receipt Date/Time: 09/05/08 09:10

Metals Department

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical Batch	Prep Batch	Qualifiers
Mercury	ND	0.200	0.0620	ug/L	1	MCV3990	MXX20774	

Batch Information

Analytical Batch: MCV3990
Analytical Method: SW7470A/E245.1
Analysis Date/Time: 09/16/08 15:58
Dilution Factor: 1

Prep Batch: MXX20774
Prep Method: METHOD
Prep Date/Time: 09/16/08 11:30

Initial Prep Wt./Vol.: 25 mL
Prep Extract Vol.: 50 mL
Container ID:1084964001-D
Analyst: RTS

Client Sample ID: **AP + T 01**
SGS Ref. #: 1084964001
Project ID: AP + T
Matrix: Water (Surface, Eff., Ground)

Collection Date/Time: 09/03/08 12:27
Receipt Date/Time: 09/05/08 09:10

Metals by ICP/MS

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical Batch	Prep Batch	Qualifiers
Antimony	0.621 J	1.00	0.310	ug/L	5	MMS5628	MXX20805	
Arsenic	ND	5.00	1.50	ug/L	5	MMS5628	MXX20805	
Barium	32.2	3.00	0.940	ug/L	5	MMS5628	MXX20805	
Beryllium	ND	1.00	0.500	ug/L	5	MMS5637	MXX20805	
Cadmium	ND	2.00	0.600	ug/L	5	MMS5628	MXX20805	
Calcium	43500	1000	310	ug/L	5	MMS5628	MXX20805	
Chromium	ND	4.00	1.20	ug/L	5	MMS5628	MXX20805	
Copper	ND	6.00	1.80	ug/L	5	MMS5628	MXX20805	
Iron	ND	1000	310	ug/L	5	MMS5628	MXX20805	
Lead	ND	1.00	0.310	ug/L	5	MMS5628	MXX20805	
Magnesium	7880	1000	310	ug/L	5	MMS5628	MXX20805	
Manganese	0.859 J	2.00	0.620	ug/L	5	MMS5628	MXX20805	
Selenium	ND	2.00	0.620	ug/L	5	MMS5628	MXX20805	
Silver	ND	2.00	0.620	ug/L	5	MMS5628	MXX20805	
Sodium	2400	1000	310	ug/L	5	MMS5628	MXX20805	
Zinc	ND	25.0	7.80	ug/L	5	MMS5628	MXX20805	
Potassium	3290	1000	310	ug/L	5	MMS5628	MXX20805	

Batch Information

Analytical Batch: MMS5628
Analytical Method: SW6020
Analysis Date/Time: 09/25/08 01:54
Dilution Factor: 5

Prep Batch: MXX20805
Prep Method: SW3010A
Prep Date/Time: 09/22/08 10:00

Initial Prep Wt./Vol.: 50 mL
Prep Extract Vol.: 50 mL
Container ID:1084964001-D
Analyst: MH

Analytical Batch: MMS5637
Analytical Method: SW6020
Analysis Date/Time: 09/27/08 19:49
Dilution Factor: 5

Prep Batch: MXX20805
Prep Method: SW3010A
Prep Date/Time: 09/22/08 10:00

Initial Prep Wt./Vol.: 50 mL
Prep Extract Vol.: 50 mL
Container ID:1084964001-D
Analyst: MH

Client Sample ID: **AP + T 01**
SGS Ref. #: 1084964001
Project ID: AP + T
Matrix: Water (Surface, Eff., Ground)

Collection Date/Time: 09/03/08 12:27
Receipt Date/Time: 09/05/08 09:10

Waters Department

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical Batch	Prep Batch	Qualifiers
Chloride	0.0880 J	0.100	0.0310	mg/L	1	WIC4256	WXX6801	
Fluoride	0.0750 J	0.100	0.0310	mg/L	1	WIC4256	WXX6801	
Sulfate	81.8	0.500	0.155	mg/L	5	WIC4256	WXX6801	
Total Suspended Solids	1.00	0.500	0.150	mg/L		STS3229		
Cyanide	0.0022 J	0.0050	0.0015	mg/L	1	WDA1442	WXX6797	
Weak Acid Dissociable CN	ND	0.0050	0.0015	mg/L	1	WDA1441	WXX6798	
Total Dissolved Solids	183	10.0	3.10	mg/L	1	WAT7166		

Batch Information

Analytical Batch: STS3229
Analytical Method: SM20 2540D
Analysis Date/Time: 09/09/08 13:45
Initial Prep Wt./Vol.: 1000 mL
Container ID:1084964001-E
Analyst: SYH

Analytical Batch: WAT7166
Analytical Method: SM20 2540C
Analysis Date/Time: 09/10/08 15:00
Dilution Factor: 1
Initial Prep Wt./Vol.: 80 mL
Container ID:1084964001-B
Analyst: SYH

Analytical Batch: WDA1441
Analytical Method: SM20 4500-CN I
Analysis Date/Time: 09/15/08 13:54
Dilution Factor: 1
Prep Batch: WXX6798
Prep Method: EXT/WAD1
Prep Date/Time: 09/15/08 09:00
Initial Prep Wt./Vol.: 6 mL
Prep Extract Vol.: 6 mL
Container ID:1084964001-C
Analyst: ACF

Analytical Batch: WDA1442
Analytical Method: SM20 4500-CN C,E
Analysis Date/Time: 09/15/08 16:46
Dilution Factor: 1
Prep Batch: WXX6797
Prep Method: EXT/CN4500
Prep Date/Time: 09/15/08 09:00
Initial Prep Wt./Vol.: 6 mL
Prep Extract Vol.: 6 mL
Container ID:1084964001-C
Analyst: ACF

Analytical Batch: WIC4256
Analytical Method: EPA 300.0
Analysis Date/Time: 09/16/08 17:48
Dilution Factor: 1
Prep Batch: WXX6801
Prep Method: H2O/EP300
Prep Date/Time: 09/16/08 14:30
Initial Prep Wt./Vol.: 10 mL
Prep Extract Vol.: 10 mL
Container ID:1084964001-A
Analyst: JDZ

Analytical Batch: WIC4256
Analytical Method: EPA 300.0
Analysis Date/Time: 09/16/08 18:49
Dilution Factor: 5
Prep Batch: WXX6801
Prep Method: H2O/EP300
Prep Date/Time: 09/16/08 14:30
Initial Prep Wt./Vol.: 10 mL
Prep Extract Vol.: 10 mL
Container ID:1084964001-A
Analyst: JDZ

Client Sample ID: **AP + T 02**
SGS Ref. #: 1084964002
Project ID: AP + T
Matrix: Water (Surface, Eff., Ground)

Collection Date/Time: 09/03/08 15:05
Receipt Date/Time: 09/05/08 09:10

Metals Department

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical Batch	Prep Batch	Qualifiers
Mercury	ND	0.200	0.0620	ug/L	1	MCV3990	MXX20774	

Batch Information

Analytical Batch: MCV3990
Analytical Method: SW7470A/E245.1
Analysis Date/Time: 09/16/08 16:07
Dilution Factor: 1

Prep Batch: MXX20774
Prep Method: METHOD
Prep Date/Time: 09/16/08 11:30

Initial Prep Wt./Vol.: 25 mL
Prep Extract Vol.: 50 mL
Container ID:1084964002-D
Analyst: RTS

Client Sample ID: **AP + T 02**
SGS Ref. #: 1084964002
Project ID: AP + T
Matrix: Water (Surface, Eff., Ground)

Collection Date/Time: 09/03/08 15:05
Receipt Date/Time: 09/05/08 09:10

Metals by ICP/MS

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical Batch	Prep Batch	Qualifiers
Antimony	ND	1.00	0.310	ug/L	5	MMS5628	MXX20805	
Arsenic	ND	5.00	1.50	ug/L	5	MMS5628	MXX20805	
Barium	44.1	3.00	0.940	ug/L	5	MMS5628	MXX20805	
Beryllium	ND	1.00	0.500	ug/L	5	MMS5637	MXX20805	
Cadmium	ND	2.00	0.600	ug/L	5	MMS5628	MXX20805	
Calcium	57600	1000	310	ug/L	5	MMS5628	MXX20805	
Chromium	ND	4.00	1.20	ug/L	5	MMS5628	MXX20805	
Copper	ND	6.00	1.80	ug/L	5	MMS5628	MXX20805	
Iron	ND	1000	310	ug/L	5	MMS5628	MXX20805	
Lead	ND	1.00	0.310	ug/L	5	MMS5628	MXX20805	
Magnesium	12900	1000	310	ug/L	5	MMS5628	MXX20805	
Manganese	1.08 J	2.00	0.620	ug/L	5	MMS5628	MXX20805	
Selenium	ND	2.00	0.620	ug/L	5	MMS5628	MXX20805	
Silver	ND	2.00	0.620	ug/L	5	MMS5628	MXX20805	
Sodium	3250	1000	310	ug/L	5	MMS5628	MXX20805	
Zinc	ND	25.0	7.80	ug/L	5	MMS5628	MXX20805	
Potassium	3660	1000	310	ug/L	5	MMS5628	MXX20805	

Batch Information

Analytical Batch: MMS5628
Analytical Method: SW6020
Analysis Date/Time: 09/25/08 02:00
Dilution Factor: 5

Prep Batch: MXX20805
Prep Method: SW3010A
Prep Date/Time: 09/22/08 10:00

Initial Prep Wt./Vol.: 50 mL
Prep Extract Vol.: 50 mL
Container ID:1084964002-D
Analyst: MH

Analytical Batch: MMS5637
Analytical Method: SW6020
Analysis Date/Time: 09/27/08 19:56
Dilution Factor: 5

Prep Batch: MXX20805
Prep Method: SW3010A
Prep Date/Time: 09/22/08 10:00

Initial Prep Wt./Vol.: 50 mL
Prep Extract Vol.: 50 mL
Container ID:1084964002-D
Analyst: MH

Client Sample ID: **AP + T 02**
SGS Ref. #: 1084964002
Project ID: AP + T
Matrix: Water (Surface, Eff., Ground)

Collection Date/Time: 09/03/08 15:05
Receipt Date/Time: 09/05/08 09:10

Waters Department

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical Batch	Prep Batch	Qualifiers
Chloride	0.0800 J	0.100	0.0310	mg/L	1	WIC4256	WXX6801	
Fluoride	0.0490 J	0.100	0.0310	mg/L	1	WIC4256	WXX6801	
Sulfate	119	0.500	0.155	mg/L	5	WIC4256	WXX6801	
Total Suspended Solids	0.700	0.500	0.150	mg/L		STS3229		
Cyanide	0.0017 J	0.0050	0.0015	mg/L	1	WDA1442	WXX6797	
Weak Acid Dissociable CN	ND	0.0050	0.0015	mg/L	1	WDA1441	WXX6798	
Total Dissolved Solids	253	10.0	3.10	mg/L	1	WAT7166		

Batch Information

Analytical Batch: STS3229
Analytical Method: SM20 2540D
Analysis Date/Time: 09/09/08 13:45
Initial Prep Wt./Vol.: 1000 mL
Container ID:1084964002-E
Analyst: SYH

Analytical Batch: WAT7166
Analytical Method: SM20 2540C
Analysis Date/Time: 09/10/08 15:00
Dilution Factor: 1
Initial Prep Wt./Vol.: 80 mL
Container ID:1084964002-B
Analyst: SYH

Analytical Batch: WDA1441
Analytical Method: SM20 4500-CN I
Analysis Date/Time: 09/15/08 13:55
Dilution Factor: 1
Prep Batch: WXX6798
Prep Method: EXT/WAD1
Prep Date/Time: 09/15/08 09:00
Initial Prep Wt./Vol.: 6 mL
Prep Extract Vol.: 6 mL
Container ID:1084964002-C
Analyst: ACF

Analytical Batch: WDA1442
Analytical Method: SM20 4500-CN C,E
Analysis Date/Time: 09/15/08 16:46
Dilution Factor: 1
Prep Batch: WXX6797
Prep Method: EXT/CN4500
Prep Date/Time: 09/15/08 09:00
Initial Prep Wt./Vol.: 6 mL
Prep Extract Vol.: 6 mL
Container ID:1084964002-C
Analyst: ACF

Analytical Batch: WIC4256
Analytical Method: EPA 300.0
Analysis Date/Time: 09/16/08 19:50
Dilution Factor: 1
Prep Batch: WXX6801
Prep Method: H2O/EP300
Prep Date/Time: 09/16/08 14:30
Initial Prep Wt./Vol.: 10 mL
Prep Extract Vol.: 10 mL
Container ID:1084964002-A
Analyst: JDZ

Analytical Batch: WIC4256
Analytical Method: EPA 300.0
Analysis Date/Time: 09/16/08 21:32
Dilution Factor: 5
Prep Batch: WXX6801
Prep Method: H2O/EP300
Prep Date/Time: 09/16/08 14:30
Initial Prep Wt./Vol.: 10 mL
Prep Extract Vol.: 10 mL
Container ID:1084964002-A
Analyst: JDZ

Client Sample ID: **AP + T 03**
SGS Ref. #: 1084964003
Project ID: AP + T
Matrix: Water (Surface, Eff., Ground)

Collection Date/Time: 09/03/08 17:50
Receipt Date/Time: 09/05/08 09:10

Metals Department

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical Batch	Prep Batch	Qualifiers
Mercury	ND	0.200	0.0620	ug/L	1	MCV3990	MXX20774	

Batch Information

Analytical Batch: MCV3990
Analytical Method: SW7470A/E245.1
Analysis Date/Time: 09/16/08 16:09
Dilution Factor: 1

Prep Batch: MXX20774
Prep Method: METHOD
Prep Date/Time: 09/16/08 11:30

Initial Prep Wt./Vol.: 25 mL
Prep Extract Vol.: 50 mL
Container ID:1084964003-D
Analyst: RTS

Client Sample ID: **AP + T 03**
SGS Ref. #: 1084964003
Project ID: AP + T
Matrix: Water (Surface, Eff., Ground)

Collection Date/Time: 09/03/08 17:50
Receipt Date/Time: 09/05/08 09:10

Metals by ICP/MS

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical Batch	Prep Batch	Qualifiers
Antimony	0.454 J	1.00	0.310	ug/L	5	MMS5628	MXX20805	
Arsenic	ND	5.00	1.50	ug/L	5	MMS5628	MXX20805	
Barium	31.8	3.00	0.940	ug/L	5	MMS5628	MXX20805	
Beryllium	ND	1.00	0.500	ug/L	5	MMS5637	MXX20805	
Cadmium	ND	2.00	0.600	ug/L	5	MMS5628	MXX20805	
Calcium	42700	1000	310	ug/L	5	MMS5628	MXX20805	
Chromium	ND	4.00	1.20	ug/L	5	MMS5628	MXX20805	
Copper	ND	6.00	1.80	ug/L	5	MMS5628	MXX20805	
Iron	ND	1000	310	ug/L	5	MMS5628	MXX20805	
Lead	ND	1.00	0.310	ug/L	5	MMS5628	MXX20805	
Magnesium	7790	1000	310	ug/L	5	MMS5628	MXX20805	
Manganese	0.907 J	2.00	0.620	ug/L	5	MMS5628	MXX20805	
Selenium	ND	2.00	0.620	ug/L	5	MMS5628	MXX20805	
Silver	ND	2.00	0.620	ug/L	5	MMS5628	MXX20805	
Sodium	2460	1000	310	ug/L	5	MMS5628	MXX20805	
Zinc	ND	25.0	7.80	ug/L	5	MMS5628	MXX20805	
Potassium	3330	1000	310	ug/L	5	MMS5628	MXX20805	

Batch Information

Analytical Batch: MMS5628
Analytical Method: SW6020
Analysis Date/Time: 09/25/08 02:06
Dilution Factor: 5
Prep Batch: MXX20805
Prep Method: SW3010A
Prep Date/Time: 09/22/08 10:00
Initial Prep Wt./Vol.: 50 mL
Prep Extract Vol.: 50 mL
Container ID:1084964003-D
Analyst: MH

Analytical Batch: MMS5637
Analytical Method: SW6020
Analysis Date/Time: 09/27/08 20:02
Dilution Factor: 5
Prep Batch: MXX20805
Prep Method: SW3010A
Prep Date/Time: 09/22/08 10:00
Initial Prep Wt./Vol.: 50 mL
Prep Extract Vol.: 50 mL
Container ID:1084964003-D
Analyst: MH

Client Sample ID: **AP + T 03**
SGS Ref. #: 1084964003
Project ID: AP + T
Matrix: Water (Surface, Eff., Ground)

Collection Date/Time: 09/03/08 17:50
Receipt Date/Time: 09/05/08 09:10

Waters Department

Parameter	Result	PQL/CL	MDL	Units	DF	Analytical Batch	Prep Batch	Qualifiers
Chloride	ND	0.100	0.0310	mg/L	1	WIC4256	WXX6801	
Fluoride	0.0870 J	0.100	0.0310	mg/L	1	WIC4256	WXX6801	
Sulfate	81.0	0.500	0.155	mg/L	5	WIC4256	WXX6801	
Total Suspended Solids	0.400 J	0.500	0.150	mg/L		STS3229		
Cyanide	ND	0.0050	0.0015	mg/L	1	WDA1442	WXX6797	
Weak Acid Dissociable CN	ND	0.0050	0.0015	mg/L	1	WDA1441	WXX6798	
Total Dissolved Solids	176	10.0	3.10	mg/L	1	WAT7166		

Batch Information

Analytical Batch: STS3229
Analytical Method: SM20 2540D
Analysis Date/Time: 09/09/08 13:45
Initial Prep Wt./Vol.: 1000 mL
Container ID:1084964003-E
Analyst: SYH

Analytical Batch: WAT7166
Analytical Method: SM20 2540C
Analysis Date/Time: 09/10/08 15:00
Dilution Factor: 1
Initial Prep Wt./Vol.: 80 mL
Container ID:1084964003-B
Analyst: SYH

Analytical Batch: WDA1441
Analytical Method: SM20 4500-CN I
Analysis Date/Time: 09/15/08 13:55
Dilution Factor: 1
Prep Batch: WXX6798
Prep Method: EXT/WAD1
Prep Date/Time: 09/15/08 09:00
Initial Prep Wt./Vol.: 6 mL
Prep Extract Vol.: 6 mL
Container ID:1084964003-C
Analyst: ACF

Analytical Batch: WDA1442
Analytical Method: SM20 4500-CN C,E
Analysis Date/Time: 09/15/08 16:46
Dilution Factor: 1
Prep Batch: WXX6797
Prep Method: EXT/CN4500
Prep Date/Time: 09/15/08 09:00
Initial Prep Wt./Vol.: 6 mL
Prep Extract Vol.: 6 mL
Container ID:1084964003-C
Analyst: ACF

Analytical Batch: WIC4256
Analytical Method: EPA 300.0
Analysis Date/Time: 09/16/08 22:33
Dilution Factor: 1
Prep Batch: WXX6801
Prep Method: H2O/EP300
Prep Date/Time: 09/16/08 14:30
Initial Prep Wt./Vol.: 10 mL
Prep Extract Vol.: 10 mL
Container ID:1084964003-A
Analyst: JDZ

Analytical Batch: WIC4256
Analytical Method: EPA 300.0
Analysis Date/Time: 09/16/08 22:53
Dilution Factor: 5
Prep Batch: WXX6801
Prep Method: H2O/EP300
Prep Date/Time: 09/16/08 14:30
Initial Prep Wt./Vol.: 10 mL
Prep Extract Vol.: 10 mL
Container ID:1084964003-A
Analyst: JDZ

SGS Ref.#	855797	Method Blank	**Printed Date/Time**	10/01/2008 10:34
Client Name	Travis/Peterson		**Prep Batch**	
Project Name/#	AP + T		**Method**	
Matrix	Water (Surface, Eff., Ground)		**Date**	

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Waters Department					
Total Suspended Solids	ND	0.500	0.150	mg/L	09/09/08
Batch STS3229					
Method SM20 2540D					
Instrument					

SGS Ref.#	856686	Method Blank	**Printed Date/Time**		10/01/2008 10:34
Client Name	Travis/Peterson		**Prep**	**Batch**	WXX6797
Project Name/#	AP + T			**Method**	EXT/CN4500
Matrix	Water (Surface, Eff., Ground)			**Date**	09/15/2008

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Waters Department					
Cyanide	ND	0.0050	0.0015	mg/L	09/15/08
Batch WDA1442					
Method SM20 4500-CN C,E					
Instrument Konelab					

SGS Ref.#	856700	Method Blank	**Printed Date/Time**		10/01/2008 10:34
Client Name	Travis/Peterson		**Prep**	**Batch**	WXX6798
Project Name/#	AP + T			**Method**	EXT/WAD1
Matrix	Water (Surface, Eff., Ground)			**Date**	09/15/2008

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Waters Department					
Weak Acid Dissociable CN	ND	0.0050	0.0015	mg/L	09/15/08
Batch WDA1441					
Method SM20 4500-CN I					
Instrument Konelab					

SGS Ref.#	857043	Method Blank	**Printed Date/Time**		10/01/2008 10:34
Client Name	Travis/Peterson		**Prep**	**Batch**	MXX20774
Project Name/#	AP + T			**Method**	METHOD
Matrix	Water (Surface, Eff., Ground)			**Date**	09/16/2008

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Metals Department					
Mercury	ND	0.200	0.0620	ug/L	09/16/08
Batch MCV3990					
Method SW7470A/E245.1					
Instrument PSA Millennium mercury AA					

SGS Ref.#	857115	Method Blank	**Printed Date/Time**		10/01/2008 10:34
Client Name	Travis/Peterson		**Prep**	**Batch**	WXX6801
Project Name/#	AP + T			**Method**	H2O/EP300
Matrix	Water (Surface, Eff., Ground)			**Date**	09/16/2008

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Waters Department					
Chloride	ND	0.100	0.0310	mg/L	09/16/08
Fluoride	ND	0.100	0.0310	mg/L	09/16/08
Sulfate	ND	0.100	0.0310	mg/L	09/16/08

Batch WIC4256
Method EPA 300.0
Instrument Metrohm 733 IC3

SGS Ref.#	857449	Method Blank	**Printed Date/Time**	10/01/2008 10:34
Client Name	Travis/Peterson		**Prep Batch**	
Project Name/#	AP + T		**Method**	
Matrix	Water (Surface, Eff., Ground)		**Date**	

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Waters Department					
Total Dissolved Solids	ND	10.0	3.10	mg/L	09/10/08
Batch WAT7166					
Method SM20 2540C					
Instrument					

SGS Ref.#	858423 Method Blank	**Printed Date/Time**		10/01/2008 10:34
Client Name	Travis/Peterson	**Prep**	**Batch**	MXX20805
Project Name/#	AP + T		**Method**	SW3010A
Matrix	Water (Surface, Eff., Ground)		**Date**	09/22/2008

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Results	Reporting/Control Limit	MDL	Units	Analysis Date
Metals by ICP/MS					
Antimony	ND	1.00	0.310	ug/L	09/24/08
Arsenic	ND	5.00	1.50	ug/L	09/24/08
Barium	ND	3.00	0.940	ug/L	09/24/08
Beryllium	ND	1.00	0.500	ug/L	09/27/08
Cadmium	ND	2.00	0.600	ug/L	09/24/08
Calcium	ND	1000	310	ug/L	09/24/08
Chromium	ND	4.00	1.20	ug/L	09/24/08
Copper	ND	6.00	1.80	ug/L	09/24/08
Iron	ND	1000	310	ug/L	09/24/08
Lead	ND	1.00	0.310	ug/L	09/24/08
Magnesium	ND	1000	310	ug/L	09/24/08
Manganese	ND	2.00	0.620	ug/L	09/24/08
Selenium	ND	2.00	0.620	ug/L	09/24/08
Silver	ND	2.00	0.620	ug/L	09/24/08
Sodium	ND	1000	310	ug/L	09/24/08
Zinc	ND	25.0	7.80	ug/L	09/24/08
Potassium	ND	1000	310	ug/L	09/24/08

Batch MMS5628
Method SW6020
Instrument Perkin Elmer Sciex ICP-MS P3

SGS Ref.#	855799	Duplicate	**Printed Date/Time**	10/01/2008 10:34
Client Name	Travis/Peterson		**Prep Batch**	
Project Name/#	AP + T		**Method**	
Original	1084788002		**Date**	
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
Waters Department						
Total Suspended Solids	17500	17700	mg/L	1	(< 25)	09/09/2008
Batch STS3229						
Method SM20 2540D						
Instrument						

SGS Ref.#	855800	Duplicate	**Printed Date/Time**	10/01/2008 10:34
Client Name	Travis/Peterson		**Prep Batch**	
Project Name/#	AP + T		**Method**	
Original	1084788004		**Date**	
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
Waters Department						
Total Suspended Solids	17400	17400	mg/L	0	(< 25)	09/09/2008

Batch STS3229
Method SM20 2540D
Instrument

SGS Ref.#	856689	Duplicate	**Printed Date/Time**		10/01/2008 10:34
Client Name	Travis/Peterson		**Prep**	**Batch**	WXX6797
Project Name/#	AP + T			**Method**	EXT/CN4500
Original	1084964001			**Date**	9/15/2008 9:00:00AM
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
Waters Department						
Cyanide	0.0022 J	0.0017 *	mg/L	27	(< 25)	09/15/2008

Batch WDA1442
Method SM20 4500-CN C,E
Instrument Konelab

SGS Ref.#	856703	Duplicate	**Printed Date/Time**		10/01/2008 10:34
Client Name	Travis/Peterson		**Prep**	**Batch**	WXX6798
Project Name/#	AP + T			**Method**	EXT/WAD1
Original	1084964001			**Date**	9/15/2008 9:00:00AM
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
Waters Department						
Weak Acid Dissociable CN	ND	ND	mg/L	0	(< 25)	09/15/2008

Batch WDA1441
Method SM20 4500-CN I
Instrument Konelab

SGS Ref.#	857117	Undigested Duplicate	**Printed Date/Time**		10/01/2008 10:34
Client Name	Travis/Peterson		**Prep**	**Batch**	WXX6801
Project Name/#	AP + T			**Method**	H2O/EP300
Original	1084964001			**Date**	9/16/2008 2:30:00PM
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1084964001, 1084964002

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
Waters Department						
Chloride	0.0880 J	0.0770	mg/L	13	(< 20)	09/16/2008
Fluoride	0.0750 J	0.0790	mg/L	5	(< 20)	09/16/2008
Sulfate	81.8	86.9	mg/L	6	(< 20)	09/16/2008

Batch WIC4256
Method EPA 300.0
Instrument Metrohm 733 IC3

SGS Ref.#	857119	Undigested Duplicate	**Printed Date/Time**		10/01/2008 10:34
Client Name	Travis/Peterson		**Prep**	**Batch**	WXX6801
Project Name/#	AP + T			**Method**	H2O/EP300
Original	1084964002			**Date**	9/16/2008 2:30:00PM
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1084964002, 1084964003

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
Waters Department						
Chloride	0.0800 J	0.0700	mg/L	13	(< 20)	09/16/2008
Fluoride	0.0490 J	0.0670 *	mg/L	31	(< 20)	09/16/2008
Sulfate	119	117	mg/L	2	(< 20)	09/16/2008

Batch WIC4256
Method EPA 300.0
Instrument Metrohm 733 IC3

SGS Ref.#	857451	Duplicate	**Printed Date/Time**		10/01/2008 10:34
Client Name	Travis/Peterson		**Prep**	**Batch**	
Project Name/#	AP + T			**Method**	
Original	1084721001			**Date**	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
Waters Department						
Total Dissolved Solids	604	603	mg/L	0	(< 25)	09/10/2008
Batch WAT7166						
Method SM20 2540C						
Instrument						

SGS Ref.#	857452	Duplicate	**Printed Date/Time**	10/01/2008 10:34
Client Name	Travis/Peterson		**Prep Batch**	
Project Name/#	AP + T		**Method**	
Original	1084721002		**Date**	
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
Waters Department						
Total Dissolved Solids	471	466	mg/L	1	(< 25)	09/10/2008

Batch WAT7166
Method SM20 2540C
Instrument

SGS Ref.#	855798	Lab Control Sample	**Printed Date/Time**	10/01/2008 10:34
			Prep Batch	
Client Name	Travis/Peterson		**Method**	
Project Name/#	AP + T		**Date**	
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Waters Department								
Total Suspended Solids	LCS	47.2	94	(90-110)			50 mg/L	09/09/2008

Batch STS3229
Method SM20 2540D
Instrument

SGS Ref.#	856687	Lab Control Sample	**Printed Date/Time**	10/01/2008	10:34
	856688	Lab Control Sample Duplicate	**Prep Batch**	WXX6797	
Client Name	Travis/Peterson		**Method**	EXT/CN4500	
Project Name/#	AP + T		**Date**	09/15/2008	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Waters Department								
Cyanide	LCS	0.052	103	(75-125)			0.05 mg/L	09/15/2008
	LCSD	0.054	107		4	(< 25)	0.05 mg/L	09/15/2008

Batch WDA1442
Method SM20 4500-CN C,E
Instrument Konelab

SGS Ref.#	856701	Lab Control Sample	**Printed Date/Time**	10/01/2008	10:34
	856702	Lab Control Sample Duplicate	**Prep Batch**	WXX6798	
Client Name	Travis/Peterson		**Method**	EXT/WAD1	
Project Name/#	AP + T		**Date**	09/15/2008	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Waters Department								
Weak Acid Dissociable CN	LCS	0.054	107	(75-125)			0.05 mg/L	09/15/2008
	LCSD	0.054	109		1	(< 25)	0.05 mg/L	09/15/2008

Batch WDA1441
Method SM20 4500-CN I
Instrument Konelab

SGS Ref.#	857044	Lab Control Sample	**Printed Date/Time**	10/01/2008	10:34
			Prep Batch	MXX20774	
Client Name	Travis/Peterson		**Method**	METHOD	
Project Name/#	AP + T		**Date**	09/16/2008	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Metals Department								
Mercury	LCS	4.01	100	(85-115)			4 ug/L	09/16/2008

Batch MCV3990
Method SW7470A/E245.1
Instrument PSA Millennium mercury AA

SGS Ref.#	857116	Lab Control Sample	**Printed Date/Time**	10/01/2008 10:34
			Prep Batch	WXX6801
Client Name	Travis/Peterson		**Method**	H2O/EP300
Project Name/#	AP + T		**Date**	09/16/2008
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Waters Department								
Chloride	LCS	9.68	97	(90-110)			10 mg/L	09/16/2008
Fluoride	LCS	10.2	102	(90-110)			10 mg/L	09/16/2008
Sulfate	LCS	9.47	95	(90-110)			10 mg/L	09/16/2008

Batch WIC4256
Method EPA 300.0
Instrument Metrohm 733 IC3

SGS Ref.#	857450	Lab Control Sample	**Printed Date/Time**	10/01/2008 10:34
			Prep Batch	
Client Name	Travis/Peterson		**Method**	
Project Name/#	AP + T		**Date**	
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Waters Department								
Total Dissolved Solids	LCS	6440	97	(75-125)			6650 mg/L	09/10/2008

Batch WAT7166
Method SM20 2540C
Instrument

SGS Ref.#	858424	Lab Control Sample	**Printed Date/Time**	10/01/2008	10:34
			Prep Batch	MXX20805	
Client Name	Travis/Peterson		**Method**	SW3010A	
Project Name/#	AP + T		**Date**	09/22/2008	
Matrix	Water (Surface, Eff., Ground)				

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Metals by ICP/MS								
Antimony	LCS	935	94	(80-120)			1000 ug/L	09/24/2008
Arsenic	LCS	961	96	(80-120)			1000 ug/L	09/24/2008
Barium	LCS	930	93	(80-120)			1000 ug/L	09/24/2008
Beryllium	LCS	105	105	(80-120)			100 ug/L	09/27/2008
Cadmium	LCS	97.8	98	(80-120)			100 ug/L	09/24/2008
Calcium	LCS	10100	101	(80-120)			10000 ug/L	09/24/2008
Chromium	LCS	370	93	(80-120)			400 ug/L	09/24/2008
Copper	LCS	981	98	(80-120)			1000 ug/L	09/24/2008
Iron	LCS	4520	90	(80-120)			5000 ug/L	09/24/2008
Lead	LCS	1010	101	(80-120)			1000 ug/L	09/24/2008
Magnesium	LCS	9610	96	(80-120)			10000 ug/L	09/24/2008
Manganese	LCS	456	91	(80-120)			500 ug/L	09/24/2008
Selenium	LCS	966	97	(80-120)			1000 ug/L	09/24/2008
Silver	LCS	100	100	(80-120)			100 ug/L	09/24/2008
Sodium	LCS	9700	97	(80-120)			10000 ug/L	09/24/2008
Zinc	LCS	945	95	(80-120)			1000 ug/L	09/24/2008
Potassium	LCS	9420	94	(80-120)			10000 ug/L	09/24/2008

Batch MMS5628
Method SW6020
Instrument Perkin Elmer Sciex ICP-MS P3

SGS Ref.#	856690	Matrix Spike	**Printed Date/Time**	10/01/2008 10:34
			Prep Batch	WXX6797
			Method	Cyanide Distillation Kone Lab
			Date	09/15/2008
Original	1084964001			
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Waters Department										
Cyanide	MS	0.0022 J	.054	105	(75-125)			0.050	mg/L	09/15/2008

Batch WDA1442
Method SM20 4500-CN C,E
Instrument Konelab

SGS Ref.#	856704	Matrix Spike	**Printed Date/Time**	10/01/2008 10:34
			Prep Batch	WXX6798
			Method	Weak Acid Disassociable CN D
			Date	09/15/2008
Original	1084964001			
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Waters Department										
Weak Acid Dissociable CN	MS	ND	.051	103	(75-125)			0.050	mg/L	09/15/2008

Batch WDA1441
Method SM20 4500-CN I
Instrument Konelab

SGS Ref.# 857045 Matrix Spike

Printed Date/Time 10/01/2008 10:34
Prep Batch MXX20774
Method Digestion Mercury (W)
Date 09/16/2008

Original 1084798004
Matrix Water (Surface, Eff., Ground)

QC results affect the following production samples:
1084964001, 1084964002, 1084964003

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Metals Department										
Mercury	MS	ND	8.12	102	(85-115)			8.00	ug/L	09/16/2008

Batch MCV3990
Method SW7470A/E245.1
Instrument PSA Millennium mercury AA

SGS Ref.#	857048	Matrix Spike	**Printed Date/Time**	10/01/2008 10:34
	857049	Matrix Spike Duplicate	**Prep Batch**	MXX20774
			Method	Digestion Mercury (W)
			Date	09/16/2008
Original	1084564001			
Matrix	Soil/Solid (dry weight)			

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Metals Department									
Mercury	MS	ND	10.2	98	(85-115)			10.4 ug/L	09/16/2008
	MSD		10.2	98		0	(< 15)	10.4 ug/L	09/16/2008

Batch MCV3990
Method SW7470A/E245.1
Instrument PSA Millennium mercury AA

SGS Ref.# 857118 Bench Spike Liquid

Printed Date/Time 10/01/2008 10:34
Prep Batch WXX6801
Method EPA 300.0 Extraction Waters/L
Date 09/16/2008

Original 1084964001
Matrix Water (Surface, Eff., Ground)

QC results affect the following production samples:
1084964001, 1084964002

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Waters Department										
Chloride	BN1	0.0880 J	9.89	98	(90-110)			10.0	mg/L	09/16/2008
Fluoride	BN1	0.0750 J	10.2	101	(90-110)			10.0	mg/L	09/16/2008
Sulfate	BN1	81.8	130	97	(90-110)			50.0	mg/L	09/16/2008

Batch WIC4256
Method EPA 300.0
Instrument Metrohm 733 IC3

SGS Ref.# 857120 Bench Spike Liquid

Printed Date/Time 10/01/2008 10:34
Prep Batch WXX6801
Method EPA 300.0 Extraction Waters/L
Date 09/16/2008

Original 1084964002
Matrix Water (Surface, Eff., Ground)

QC results affect the following production samples:
1084964002, 1084964003

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Waters Department										
Chloride	BN1	0.0800 J	9.89	98	(90-110)			10.0	mg/L	09/16/2008
Fluoride	BN1	0.0490 J	10.2	102	(90-110)			10.0	mg/L	09/16/2008
Sulfate	BN1	119	167	96	(90-110)			50.0	mg/L	09/16/2008

Batch WIC4256
Method EPA 300.0
Instrument Metrohm 733 IC3

SGS Ref.#	858425	Matrix Spike	**Printed Date/Time**	10/01/2008 10:34
	858426	Matrix Spike Duplicate	**Prep Batch**	MXX20805
			Method	3010 H20 Digest for Metals ICI
			Date	09/22/2008
Original	1084873002			
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Metals by ICP/MS											
Iron		MS	46100	52200	121*	(80-120)			5000	ug/L	09/24/2008
		MSD		49700	72*		5	(< 15)	5000	ug/L	09/24/2008
Manganese		MS	10800	11300	111	(80-120)			500	ug/L	09/27/2008
		MSD		11600	162*		2	(< 15)	500	ug/L	09/27/2008

Batch	MMS5637
Method	SW6020
Instrument	Perkin Elmer Sciex ICP-MS P3

SGS Ref.#	858427	Bench Spike DIGESTED	**Printed Date/Time**	10/01/2008 10:34
			Prep Batch	MXX20805
			Method	3010 H20 Digest for Metals ICI
			Date	09/22/2008
Original	1084873002			
Matrix	Water (Surface, Eff., Ground)			

QC results affect the following production samples:

1084964001, 1084964002, 1084964003

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Metals by ICP/MS										
Iron	BND	46100	68800	91	(75-125)			25000	ug/L	09/24/2008
Manganese	BND	10800	23600	103	(75-125)			12500	ug/L	09/27/2008

Batch	MMS5637
Method	SW6020
Instrument	Perkin Elmer Sciex ICP-MS P3

SGS

1084964

CHAIN OF CUSTODY RECORD
SGS Environmental Services Inc.

Locations Nationwide
- Alaska
- Hawaii
- Ohio
- Maryland
- New Jersey
- North Carolina
- West Virginia

www.us.sgs.com

086660

(1)

CLIENT: Travis/Peterson Environmental Consulting Inc.

CONTACT: Molly Green PHONE NO:(907) 455-7225

PROJECT: AP+T SITE/PWSID#:

REPORTS TO: Molly Green E-MAIL: molly@tpeci.com

FAX NO.:( )

INVOICE TO: TPECI QUOTE # 8374

P.O. NUMBER 1311-01

SGS Reference: Pb, Mg, Mn, K, Se, Ag, Na, Zn

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP G=GRAB)	Preservatives Used	4°C	4°C	HNO3	NaOH	NaOH	4°C	4°C			
							Analysis Required (3)	IC EPA 300.0 Cl-F-SO4 2-	Mercury SW 7470	Metals-Sb, As, Ba, Be, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, K, Se, Ag, Na, Zn	Total CN SM 20 4500-CN-E	WAD CN SM20 4500-CN-I	TDS SM18 2540C	TSS SM20 2540D			REMARKS
1 A-E	AP+T 01	9/3/08	12:27	water	5	C		X	X	X	X	X	X	X			
2	AP+T 02	9/3/08	15:05	water	5	C		X	X	X	X	X	X	X			
3	AP+T 03	9/3/08	17:50	water	5	C		X	X	X	X	X	X	X			

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:	Date	Time
Molly Green	9/4/08	10:37	Carmon Belne	9/04/08	1037
Relinquished By: (2)	Date	Time	Received By:	Date	Time
Carmon Belne	9/04/08	1130			
Relinquished By: (3)	Date	Time	Received By:	Date	Time
Relinquished By: (4)	Date	Time	Received By:	Date	Time
				9/5/08	9:10

(4)

Shipping Carrier: FDX 7ID

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 3.3 °TB: 1.7

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions: Metals - Sb, As, Ba, Be, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn K, Se, Ag, Na, Zn

Requested Turnaround Time:

☐ RUSH _____ Date Needed ☒ STD

Page 48 of 50

☐ 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
☐ 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
☐ 1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

SGS

1084964

SAMPLE RECEIPT FORM

SGS WO#:

Yes	No	NA		
___	✓	___	Are samples **RUSH**, priority or *w/in 72 hrs* of **hold time**?	**TAT (circle one):** ~~Standard~~ or- Rush
___	___	✓	If yes, have you done *e-mail ALERT notification*?	**Received Date:** 9/04/08
___	✓	___	Are samples *within 24 hrs.* of **hold time** or **due date**?	**Received Time:** 1037
___	___	✓	If yes, have you also *spoken with* supervisor?	Is **date/time conversion** necessary? NO
___	✓	___	Archiving bottles (if req'd): Are they properly marked?	# of hours to AK Local Time: NA
___	___	___	Are there any **problems**? PM Notified? _____	**Thermometer ID:** FBX710
___	___	___	Were samples preserved correctly and pH verified?	
			_____	
			_____	
			_____	
___	✓	___	If this is for PWS, provide **PWSID.** _____	
___	✓	___	Will courier charges apply?	
			Method of payment? _____	
✓	___	___	Data package required? (Level: 1 / (2) / 3 / 4)	
			Notes: _____	
___	✓	___	Is this a DoD project? (USACE, Navy, AFCEE)	

Cooler ID	Temp Blank	Cooler Temp
1	1.7 °C	3.3 °C
	°C	°C
	°C	°C
	°C	°C
	°C	°C

Note: Temperature readings include thermometer correction factors

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

Airbill # _____

Additional Sample Remarks: *(√if applicable)*

_____ Extra Sample Volume?
_____ Limited Sample Volume?
_____ MeOH field preserved for volatiles?
_____ Field-filtered for dissolved_____
_____ Lab-filtered for dissolved_____
_____ Ref Lab required? _____
_____ Foreign Soil?

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

Yes	No	
___	___	Is received temperature 4 ± 2°C? Exceptions: _____ Samples/Analyses Affected: _____
___	___	If temperature(s) <0 °C, were containers ice-free? N/A *Notify PM immediately of any ice in samples.*
___	___	Was there an airbill? *(Note # above in the right hand column)*
___	___	Was cooler sealed with custody seals? # / where: _____
___	___	Were seal(s) intact upon arrival?
___	___	Was there a COC with cooler?
___	___	Was COC sealed in plastic bag & taped inside lid of cooler?
___	___	Was the COC filled out properly?
___	___	Did the COC indicate USACE / Navy / AFCEE project?
___	___	Did the COC and samples correspond?
___	___	Were all sample packed to prevent breakage? Packing material: _____
___	___	Were all samples unbroken and clearly labeled?
___	___	Were all samples sealed in separate plastic bags?
___	___	Were all VOCs free of headspace and/or MeOH preserved?
___	___	Were correct container / sample sizes submitted?
___	___	Is sample condition good?
___	___	Was copy of CoC, SRF, and custody seals given to PM to fax?

This section must be filled if problems are found.

Yes	No	
___	___	Was client notified of problems?

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

Change Order Required? _____
SGS Contact: _____

Notes: Client is aware of low temperature blank temperature & wants to proceed with analysis CAB 9/04/08

Completed by (sign): Carmon Beene **(print):** CARMON BEENE

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

SGS

SGS W 1084964

SAMPLE RECEIPT FORM FOR TRANSFERS
From
FAIRBANKS, ALASKA OR HONOLULU, HAWAII
To
ANCHORAGE, AK

TO BE COMPLETED IN ANCHORAGE UPON ARRIVAL FROM FAIRBANKS OR HAWAII.
NOTES RECORDED BELOW ARE ACTIONS NEEDED UPON ARRIVAL IN ANCHORAGE.

Notes: _____

Receipt Date / Time: 9-5-08 0910

Is Sample Date/Time Conversion Necessary? Yes _____ **No** ✓

Number of Hours From Alaska Local Time: _____

Foreign Soil? Yes _____ **No** ✓

Delivery method to Anchorage (*circle all that apply*):

Alert Courier / UPS / FedEx / USPS / AA Goldstreak / NAC / ERA / PenAir / Carlile / Lynden / SCS

Other: _____

Airbill # _____

COOLER AND TEMP BLANK READINGS* 69L

Cooler ID	Temp Blank (°C)	Cooler (°C)	Cooler ID	Temp Blank (°C)	Cooler (°C)
1	2.1	2.1			

CUSTODY SEALS INTACT: YES / NO
#/ WHERE: 2 FRONT & BACK TOP CTN

COMPLETED BY: _____

**Temperature readings include thermometer correction factors.*

SGS

1084964

SAMPLE RECEIPT FORM (page 2)

SGS

#	Container ID	Matrix	Test	QC	TB	Container Volume: 1 L	500 mL	250 mL	125 mL	60 mL	40 mL	8oz (250 mL)	4oz (125 mL)	Other	Container Type: AG	CG	HDPE	Nalgene	Cubie	Coli	Septa	Other	Preservative: None	HCl	HNO_3	H_2SO_4	MeOH	$Na_2S_2O_3$	NaOH	Other
1-3	A	1	Cl, F, SO4						1	3							✓						✓							
	B	1	TDS					1	1								✓						✓							
	C	1	T.CN, WAD CN					1	1								✓												✓	
	D	1	Metals Hg					1									✓								✓					
	E	1	TSS			1											✓						✓							
Bottle Totals						1		1	2	1																				

Completed by: [signature] Date: 9/5/08

Form # F004r16 revised 03/10/08

SGS Environmental

CUSTODY SEAL WO# 4961, 4963, 4964

Signature: Carmon Beene Date/Time: 9/04/08 1645

SGS Environmental

CUSTODY SEAL WO# 4961, 4963, 4964

Signature: Carmon Beene Date/Time: 9/04/08 1630

1084964

1

1084964

SGS Environmental

CUSTODY SEAL

Signature: Molly Green Date/Time: 9/4/08 10:11

1084964

1084964

APPENDIX C

DATA SHEETS AND FIELD NOTEBOOK

Travis/Peterson Environmental Consulting
Hydrology Field Data Sheet

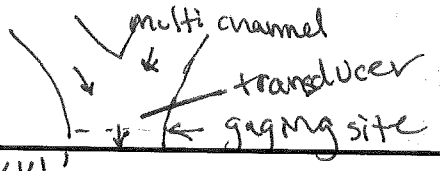
Site ID	Yerrick Creek Diversion	**Instruments/Methods:**
Stream or River	Yerrick Creek	Model 1205 Price Mini Current Meter
Date	9/3/08	YSI 63 - Conductivity, Temperature, pH
Time start	10:55	YSI 95 - Dissolved oxygen
Time finish	12:30	Hach 8203 Alkalinity
Latitude	63° 20.639' N	8025 Color, 8192 Nitrate, 8048 O-Phos
Longitude	143° 37.715' W	Imhoff Cone - settleable solids
Datum	WGS 84	Hach 2100 Turbidimeter

Site Description Elevation 2272 ft. Below confluence of Yerrick Creek main channel and 2 tributaries. First unified channel. At transducer site.

Site Conditions Rapid flow, boulders, Partly cloudy, calm.

Personnel Present Molly Green, Steve Grabacki + Assistant (Craig), Mike (AP+T)

Stream gaging Sketch



RB: 231'
LB: 67'

Width (feet) 44'

Gaging notes "mini" meter used. Fast, but mostly too shallow for AA meter. gaging data next page

In-Situ Measurements					
Temperature	°C	4.5°C			
pH	pH units	8.01	at	4.5	°C
Conductivity	µS/cm	171 µS	at	4.5	°C
Specific Conductance	µS/cm	260 µS	at	4.5	°C
Dissolved oxygen	mg/L	16.02	at	4.5°C	°C
Settleable Solids	mL/L	<0.1 mL/L			

At Camp Measurements		
Alkalinity	57.6	mg/L as CaCO3
Color (unfiltered)	4	Pt Co Units
Turbidity	0.91	NTU
Nitrate	0.01	mg/L
Orthophosphate	0.18	mg/L

Laboratory Samples		
Sample ID	water: AP+T 01	sediment: N/A
Work Order Number	1084964	
Number of Bottles	water: 5	sediment: N/A
Time	water: 12:27	sediment: N/A
Duplicate ID	N/A	

Calibration Notes:

notebook:		Date	Result	
MG2	Pre-sampling Calibration	9/3/08	Good	pH/cond.
	Post-sampling check	9/4/08	Good	pH/cond.

7/01//08

Travis/Peterson Environmental Consulting
Hydrology Field Data Sheet

Yorrick Creek Diversion
9/3/08

Gaging Data

Distance	Revolutions	Time	Depth
decimal feet	count	seconds	decimal feet
66	23	60	0.30
64	97	60	0.80
62	93	60	0.90
60	155	60	1.35
58	178	60	1.40
56	245	60	1.75
54	260	60	1.30
52	270	60	1.35
50	278	60	1.35
48	176	60	1.20
46	232	60	0.85
44	198	60	1.00
42	172	60	0.95
40	173	60	0.70
38	127	60	0.75
36	152	60	0.60
34	90	60	0.45
32	107	60	0.50
30	90	60	0.65
28	70	60	0.40
26	32	60	0.25
24	no flow	—	<0.1

Discharge: 110 CFS

7/01//08

Travis/Peterson Environmental Consulting

Hydrology Field Data Sheet

Site ID	Cathedral Rapids Cr. #1 DW 15507	**Instruments/Methods:**
Stream or River	Cathedral Rapids Cr. #1	Model 1205 Price Mini Current Meter
Date	9/3/08	YSI 63 - Conductivity, Temperature, pH
Time start	13:50	YSI 95 - Dissolved oxygen
Time finish	16:00	Hach 8203 Alkalinity
Latitude	63° 21.090' N	8025 Color, 8192 Nitrate, 8048 O-Phos
Longitude	143° 43.151' W	Imhoff Cone - settleable solids
Datum	WGS 84	Hach 2100 Turbidimeter

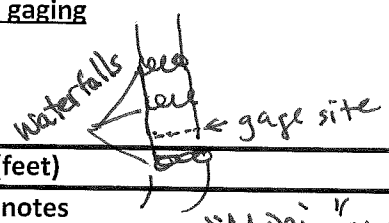
Site Description Narrow, rapid, multiple waterfalls / boulders / whitewater along stretch.

Site Conditions Partly cloudy, calm.

Personnel Present Molly Green; Steve Grahack it + Craig; Mike AP+T

Stream gaging

Sketch



RB: 4'

LB: 22.5'

Width (feet) 18.5'

Gaging notes "Mini" meter

gaging data next page

In-Situ Measurements

Temperature	°C	5.0°C			
pH	pH units	8.18	at	5.0	°C
Conductivity	µS/cm	230 µS	at	5.0	°C
Specific Conductance	µS/cm	384 µS	at	5.0	°C
Dissolved oxygen	mg/L	12.39 mg/L	at	5.0	°C
Settleable Solids	mL/L	<0.1 mL/L			

At Camp Measurements

Alkalinity	80.4	mg/L as CaCO3
Color (unfiltered)	0	Pt Co Units
Turbidity	0.70	NTU
Nitrate	0.01	mg/L
Orthophosphate	0.21	mg/L

Laboratory Samples

Sample ID	water: AP+T 02		sediment:	N/A
Work Order Number	1084964			
Number of Bottles	water: 5		sediment:	N/A
Time	water: 15:05		sediment:	N/A
Duplicate ID	N/A			

Calibration Notes:

notebook:		Date	Result	
MG2	Pre-sampling Calibration	9/3/08	Good	pH/cond
	Post-sampling check	9/4/08	Good	pH/cond

7/01//08

Travis/Peterson Environmental Consulting
Hydrology Field Data Sheet

Cathedral Rapids #1
Diversion
9/3/08

Gaging Data

Distance	Revolutions	Time	Depth
decimal feet	count	seconds	decimal feet
22	8	60	0.15
21	14	60	0.40
20	53	60	0.60
19	102	60	0.80
18	37	60	0.85
17	48	60	0.70
16	58	60	0.70
15	210	60	0.85
14	168	60	1.0
13	220	60	1.3
12	133	60	1.55
11	129	40	1.30
10	68	60	1.20
9	145	60	1.10
8	188	60	0.95
7	14	60	0.65
6	16	60	0.35
5	14	60	0.20
4	edge	60	edge (0)

Discharge:
27 CFS

7/01//08

Travis/Peterson Environmental Consulting
Hydrology Field Data Sheet

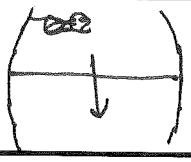
Site ID	Yerrick Creek Reentry	**Instruments/Methods:**
Stream or River	Yerrick Creek	Model 1205 Price Mini Current Meter
Date	9/3/08	YSI 63 - Conductivity, Temperature, pH
Time start	4:35 (16:35)	YSI 95 - Dissolved oxygen
Time finish	6:00 (18:00)	Hach 8203 Alkalinity
Latitude	63° 22.442' N	8025 Color, 8192 Nitrate, 8048 O-Phos
Longitude	143° 36.769' W	Imhoff Cone - settleable solids
Datum	WGS 84	Hach 2100 Turbidimeter

Site Description Wider spot - fewest boulders. Near old pipeline corridor. Gas pipeline marking throughout area.

Site Conditions Partly cloudy

Personnel Present Molly Green Mike (AP+T)

Stream gaging Sketch



RB: 10'
LB: 61.5'

Width (feet) 51.5'

Gaging notes "Mini" Meter

gaging data next page

In-Situ Measurements					
Temperature	°C	6.2-6.4°C			
pH	pH units	8.14	at	6.4	°C
Conductivity	µS/cm	160.3 µS	at	6.3	°C
Specific Conductance	µS/cm	277 µS	at	6.3	°C
Dissolved oxygen	mg/L	18.51	at	6.2	°C
Settleable Solids	mL/L	<0.1 mL/L			

At Camp Measurements		
Alkalinity	64.0	mg/L as CaCO3
Color (unfiltered)	6	Pt Co Units
Turbidity	0.89	NTU
Nitrate	0.03	mg/L
Orthophosphate	0.19	mg/L

Laboratory Samples				
Sample ID	water: AP+T 03	sediment:	N/A	
Work Order Number	1084964			
Number of Bottles	water: 5	sediment:	N/A	
Time	water: 17:50	sediment:	N/A	
Duplicate ID	N/A			

Calibration Notes:

notebook:		Date	Result	
M62	Pre-sampling Calibration	9/3/08	Good	pH/cond
	Post-sampling check	9/4/08	Good	pH/cond

7/01//08

Travis/Peterson Environmental Consulting
Hydrology Field Data Sheet

Yerrick Creek Re-entry

9/3/08

Gaging Data

Distance	Revolutions	Time	Depth
decimal feet	count	seconds	decimal feet
60	11	60	0.15
58	34	60	0.20
56	101	60	1.00
54	213	60	1.15
52	197	60	0.95
50	186	60	0.55
48	150	60	0.75
46	123	60	0.85
44	208	60	1.25
42	256	60	1.60
40	226	60	1.20
38	290	60	0.90
36	212	60	0.80
34	260	60	0.75
32	235	60	1.05
30	98	60	1.50
28	71	60	1.00
26	25	60	1.15
24	Rocks	—	—
22	16	60	0.65
20	80	60	0.80
18	48	60	0.65
16	15	60	0.50
14	37	60	0.40
12	rocks	—	—

Discharge:
99 CFS

7/01//08

Location Pre-trip Calibration for Yarick Cr. Date 9/2/08

Project / Client 1311-01 AP+T

Yarick Cr. Hydroelectric.

6:35 AM

YSI 63	Calibration	Post Cal Check
pH 7	7.00 @ 7.0°C	7.09 @ 9.1°C
4	4.00 @ 11.8°C	4.00 @ 9.5°C
10	10.16 @ 11.7°C	10.17 @ 11.5

Conductivity → 1000 µS 12.8°C

7:00 leave for Tok - odometer 049183

3:20 Meeting w/ AP+T.
View sites today. Tomorrow - sampling.
Sign in.

5:40 Took a look at the two diversion sites. Meet tomorrow at 8 to sample.

MG 9/3/08

Location TOK, AK Date 9/3/08

Project / Client 1311-01 AP&T

Yerrick Creek Hydroelectric Project

7:35 YSI63 calibration

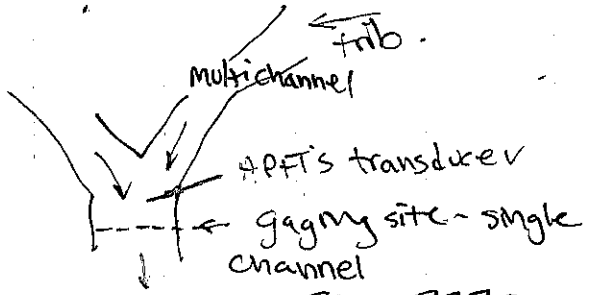
pH 7	7.03 @ 18.6	7.04 @ 18.4
pH 4	4.00 @ 18.7	3.98 @ 18.6
pH 10	10.08 @ 18.7	10.08 @ 18.3

cond - 1000 at 18.7

YSI 95 - DO - calibrate at first sample site b/c of elevation difference.

10:55 Yerrick Creek diversion

10:55 Imhoff cone started



Waypoint: YER-UP Elev. 2272

N 63° 20.639'

W 143° 37.715'

WGS84

RB: 23'

LB: 67'

width: 44

12:04 pm Imhoff cone <0.1 mL/L

2 MG 9/3/08

Location Yerrick Creek Diversion Date 9/3/08

Project / Client 1311-01 AP&T

Distance	depth	revolutions	time
66	.30	23	60 sec.
64	.80	97	
62	.90	93	
60	1.35	155	
58	1.4	178	
56	1.75	245	
54	1.3	260	
52	1.35	270	
50	1.35	278	
48	1.2	176	
46	.85	232	
44	1.	198	
42	.95	172	
40	.7	173	
38	.75	127	
36	.6	152	
34	.45	90	
32	.5	107	
30	.65	90	
28	.4	70	
26	.25	32	
24	less than .1	no flow	

Gaging finish 12:03 pm

2 MG 9/3/08

50

Location Yerrick Creek Diversion Date 9/3/08

Project / Client 1311-01 AP+T

12:05 YSI 95 calibration

Alt: 2300 Barometer: 27.30

0 ppt

12.4°C

Reading on previous cal: 52.6%

Calibration 91.8%

Refreshed air in chamber → cal again - 91.8% 12°C

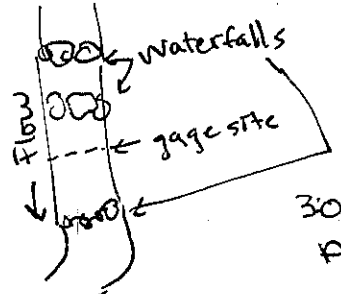
Water Sample 12:27 pm AP+T 01

pH	8.01	at 4.5 °C
Conductivity	171	µS at 4.5°C
Specific Conductance	260	µS at 4.5°C
Dissolved oxygen	16.02	mg/L at 4.5°C

Cathedral Rapids No. 1 ~~Diversion~~

1:50 WPT: CR1-UP Elev. 2455

N: 63° 21.090' ; W: 143° 43.151' WGS84



1:57 Imhoff cone started

LB: 22.5'

RB: 4'

305 pm water sample AP+T 02

DO calibration: 2500 ft, 0 ppt, 91.1%

13.8°C Bar: 27.09

MG 9/3/08

51

Location ~~Yerrick~~ Cathedral Rapids Creek Diversion Date 9/3/08

Project / Client 1311-01 AP+T

Dist	depth	revs	time
22	.15	8	60 sec
21	.4	14	
20	.6	53	
19	.8	102	
18	.85	37	
17	.7	48	
16	.70	58	
15	.85	210	
14	1.0	168	
13	1.3	220	
12	1.55	133	
11	1.3	129	
10	1.2	68	
9	1.1	145	
8	.95	188	
7	.65	14	
6	.35	16	
5	.2	14	
4	Edge		

pH	8.18	at	5 °C	Imhoff < 0.1 mL/L
Conductivity	230	µS at	5 °C	
Spec. Conduct	384	µS at	5 °C	3:20 pm
D.O.	12.39	mg/L at	5 °C	

MG 9/3/08

Location Yerrick Creek Re-entry Date 9/3/08

Project / Client 1311-01 AP+T

4:36 Imhoff cone started

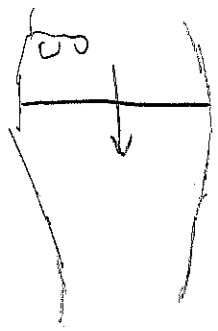
WPT YER-DN

Elev: 1856 ft

N 63° 22.442'

W 143° 36.769'

WGS84



RB: 10'

LB: 61.5'

Wdth: 51.5'

gaging start 4:51 pm

gaging end 5:? pm

5:50 PM water sample ART 03

DO calibration

1900 ft, 0ppt, 93.2%, 14.3°C

Bar: 27.71

pH	8.14	@ 6.4°C
conductivity	160.3	@ 6.3°C
Spec. conductance	277	@ 6.3°C
D.O.	18.51	@ 6.2°C

Imhoff cone <0.1 ml/l 5:58 pm

6:30 pm - leaving from gravel pit - take care of post-cal-check, short hold chemistry, and sample labels / COC in morning.

MG 9/3/08

Location Yerrick Creek Reentry Date 9/3/08

Project / Client 1311-01 AP+T

Dist.	depth	rev	time
60	.15	11	40 sec
58	.2	34	
56	1.	101	
54	1.15	213	
52	.95	197	
50	.55	186	
48	.75	150	
46	.85	123	
44	1.25	208	
42	1.60	256	
40	1.2	226	
38	.9	290	
36	.8	212	
34	.75	260	
32	1.05	235	
30	1.5	98	
28	1.	71	
26	1.15	25	
24	Rocks		
22	.65	16	
20	.8	80	
18	.65	48	
16	.5	15	
14	.4	37	
12	Rocks		

MG 9/3/08

Location Office · Chemistry/cal-check 9/4/08

Project / Client 1311-01 AP+T

Sample	Nitrate (mg/L)	orthophosphate (mg/L)
AP+T01	0.01	0.18
AP+T02	0.01	0.21
AP+T03	0.03	0.19

Sample	(mg/L as $CaCO_3$) Alkalinity	(Pt Co units) Color	(NTU) Turbidity
AP+T01	57.6	4	0.91
AP+T02	80.4	0	0.70
AP+T03	64.0	6	0.89
0-10	—	—	6.17
0-100	—	—	55.5
0-1000	—	—	500

Sample	Nitrite (mg/L)
AP+T01	0.002
AP+T02	0.002
AP+T03	0.002

Alkalinity: 25mL sample, 0.1600, multiplier 0.4

All AP+T01 analyses completed by 12:00.

All other analyses completed by 12:42.

Calcheck: 45163

Specific conductance 1000 µS standard: 1001 µS at 22.3°C

pH 7: 7.05 at 21.9°C (7.02 @ 20°C)

pH 9: 3.98 at 21.7°C (4.00 @ 20°C)

pH 10: 10.05 at 21.4°C (10.05 @ 20°C)

JMG 9/4/08

Location Date

Project / Client

9.3.4. – PRELIMINARY JURISDICTIONAL DETERMINATION

Yerrick Creek Hydroelectric Project
Tok, Alaska

Preliminary Jurisdictional Determination

February 2009

Prepared for:
Alaska Power and Telephone Company
PO Box 3222
Port Townsend, WA 98368

Prepared by:

HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503

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Tables

Yerrick Creek Hydroelectric Project
Preliminary Jurisdictional Determination

1. Introduction and Purpose

The purpose of this report is to identify and describe wetlands and other waters within an approximately 700-acre area along Yerrick Creek near Tok, Alaska (Figure 1). The area contains land owned by the State of Alaska and by Tanacross, Inc.

This report describes locations within the project area that are subject to the jurisdiction of the US Army Corps of Engineers (USACOE) under authority of Section 404 of the Clean Water Act. By federal law (Clean Water Act) and associated policy, it is necessary to avoid project impacts to wetlands wherever practicable, minimize impact where impact is not avoidable, and in some cases compensate for the impact. The focus of this document is on delineation of wetlands. Wetlands, waters of the U.S., and uplands (non-wetlands), as referenced in this report, are defined as:

Wetlands. "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 Code of Federal Regulations [CFR] Part 328.3(b)). Wetlands are a subset of "waters of the U.S." Note that the "wetlands" definition does not include unvegetated areas such as streams and ponds.

Waters of the U.S. Waters of the U.S. include other waterbodies regulated by the USACOE, such as lakes, ponds, and streams, in addition to wetlands. The ponds and streams mapped in the project area are "waters of the U.S." but not "wetlands".

Uplands. Non-water and non-wetland areas are called uplands.

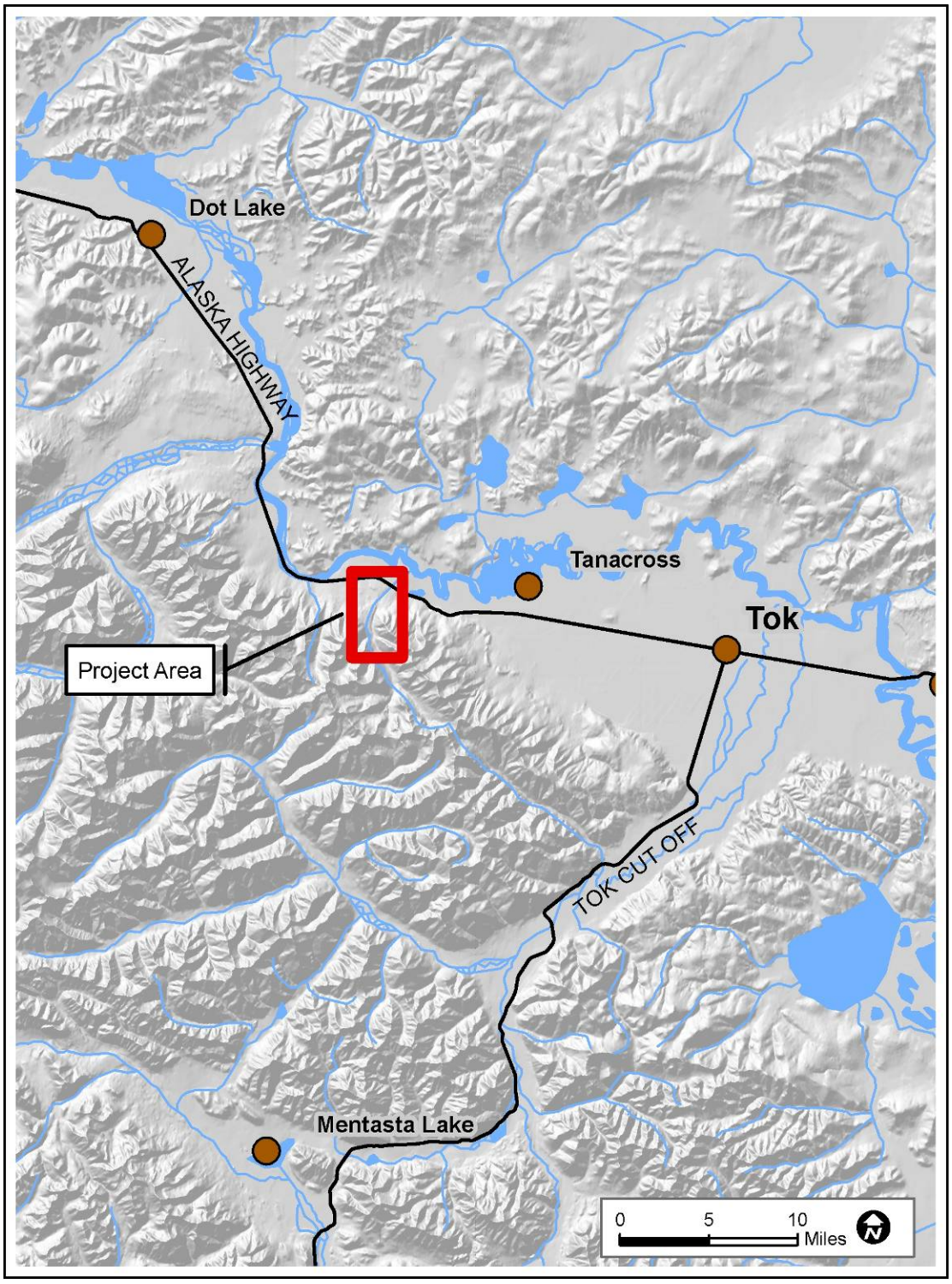
As described in the 1987 U.S. Army Corps of Engineers wetlands delineation manual, wetlands must possess the following three characteristics:

1. Hydrophytic Vegetation: Vegetation community dominated by plant species that are typically adapted for life in saturated soils.

2. Wetland Hydrology: Inundation or saturation of the soil during the growing season.

3. Hydric Soils: Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions.

Figure 1: Project Vicinity Map



Project Location and Environment

The project area is located along Yerrick Creek, a cobble-, gravel- and sand-substrate creek which crosses the Alaska Highway at approximately milepost 1339 (Figure 2). Most of the project area is undeveloped, with an open gravel waterway, adjacent forests, abandoned gravel side channels in various states of revegetation, and heavily forested banks (see images below). Specific legal and geographic descriptions for the property required for Preliminary Jurisdictional Determinations are included in Table 1.

Figure 2: Yerrick Creek Photos

Table 1: Project Area Information

1. APPLICANT: Alaska Power and Telephone Company (AP&T)
2. WATERWAY: Yerrick Creek
3. LOCATION:

A. Narrative: The project area is along Yerrick Creek near Tok, Alaska, approximately 20 miles west of Tok at milepost 1339 of the Alaska Highway.

B. Legal Description:
Sections: 36 and 1, 2, 11, and 14 Township: 19N and 18N Range: 9E Meridian: Copper River
Latitude/Longitude (WGS84 Datum): N55.0667159 / W132.1461172

4. SOURCE(S):

USGS Maps: Tanacross B-6
NWI Maps: Tanacross B-6, digital interpretation
Soil Maps: None
Corps Wetland Maps: None
Aerial Photographs: True Color Aerial Photography, 2008, provided by AP&T. Color Infrared High Altitude Aerial Photography, 1978, from the Alaska GeoData Center archives.
Other: Reconnaissance-level field survey with wetland data forms, written site observations, and photographs from HDR Alaska, Inc. site visit dated August 21-25, 2008.

2. Methods

Two steps were used to inventory wetlands and waterbodies in the project area. These two steps include:

Field Investigation

A five-day site visit was completed between August 21 and 25, 2008, to identify any wetlands and other waters potentially under the jurisdiction of the USACOE. USACOE guidance on Alaska's growing season references the end of the growing season to generally

follow several continuous days below 28°F. Temperature and precipitation data for the three-month period prior to the field investigation (June 2008 through August 2008) was reviewed to determine the degree to which any recent climatic events may have influenced field hydrology and vegetation indicators. Weather and climate data are given in Appendix A, including monthly summaries of temperature and precipitation, recording period average, and stream gage output for part of 2008 for Yerrick Creek.

The general trend in the summer of 2008 was a colder, wetter season than normal. Over the three-month period preceding the field visit, the average maximum temperature in °F (64.87 for June, 63.9 for July, and 61.52 for August) was lower than the average maximum temperature for the recording period of 1954 to 2005 (71 for June, 73 for July, and 68 for August) (NOAA 2008). The average minimum temperature (48.39 for June, 48.55 for July, and 42.9 for August) was higher than the average minimum temperature for the recording period (40 for June, 43 for July, and 39 for August). Precipitation for June 2008 was 2.12 inches compared to an average of 1.82 inches. July precipitation average for the period 1946 to 2008 is 2 inches, compared to the single year (2008) measurement of 6.68 inches. August average is 1.2 inches, compared to the 2008 measurement of 0.79 inches. The much higher than average precipitation in July led to higher than normal water levels in the creek, and unusual conditions at the study site during the field survey. Side channels that normally lack water experienced flow during July, according to AP&T personnel familiar with the project area. Observations of side channels by AP&T personnel and HDR scientists suggested that such channels had not experienced any flow in over 20 years. A stream gage on the main channel of Yerrick Creek was knocked out during an especially high storm at the end of July.

Scientists collected detailed information on soil conditions, hydrology, and plant community composition. A summary table listing plot number, wetland status, wetland mapping code from the U.S. Fish and Wildlife's National Wetland Inventory (NWI) mapping program (USFWS 2006), and photo numbers is found in Appendix B. Photographs taken at each of the data collection locations are included in Appendix C. Locations were studied using the U.S. Corps of Engineers 1987 wetland delineation manual's (USACOE 1987) and 2007 Alaska Regional Supplement's (USACOE 2007) three-parameter method of determining an area's wetland status. Standard 2007 Alaska Regional Supplement Corps of Engineers data sheets were completed at these sites and are included in Appendix D. Each location visited during the field visit was logged into a handheld global positioning system (GPS) Archer Field PC unit. Representative photographs and observational data were collected at each plot.

While in the field, wetland/upland boundaries were determined by completing standard wetland data forms near observable transition zones between wetter and drier areas. A wetland determination is completed in the area with questionable wetland status, then the boundary identified in the appropriate direction between that point and obvious wetlands or uplands. The wetland/upland boundary between the two data plots is then notated on paper aerial photography maps of the area for later guidance in Geographic Information System (GIS) mapping of wetland/upland boundaries. In addition, photo points were taken at more sites to document conditions at a wider range of locations. For these points, a data sheet was not completed, but photos were taken and conditions were notated in a field notebook.

Mapping

Scientists analyzed aerial photography and NWI wetland mapping in a GIS map environment. GPS locations of field-visited sites and wetland/upland boundaries were overlaid on aerial photography and notes and photographs completed at each site were reviewed to identify any wetlands or waterbodies present within the project area. The process of delineating wetlands from aerial photography included using the following methods:

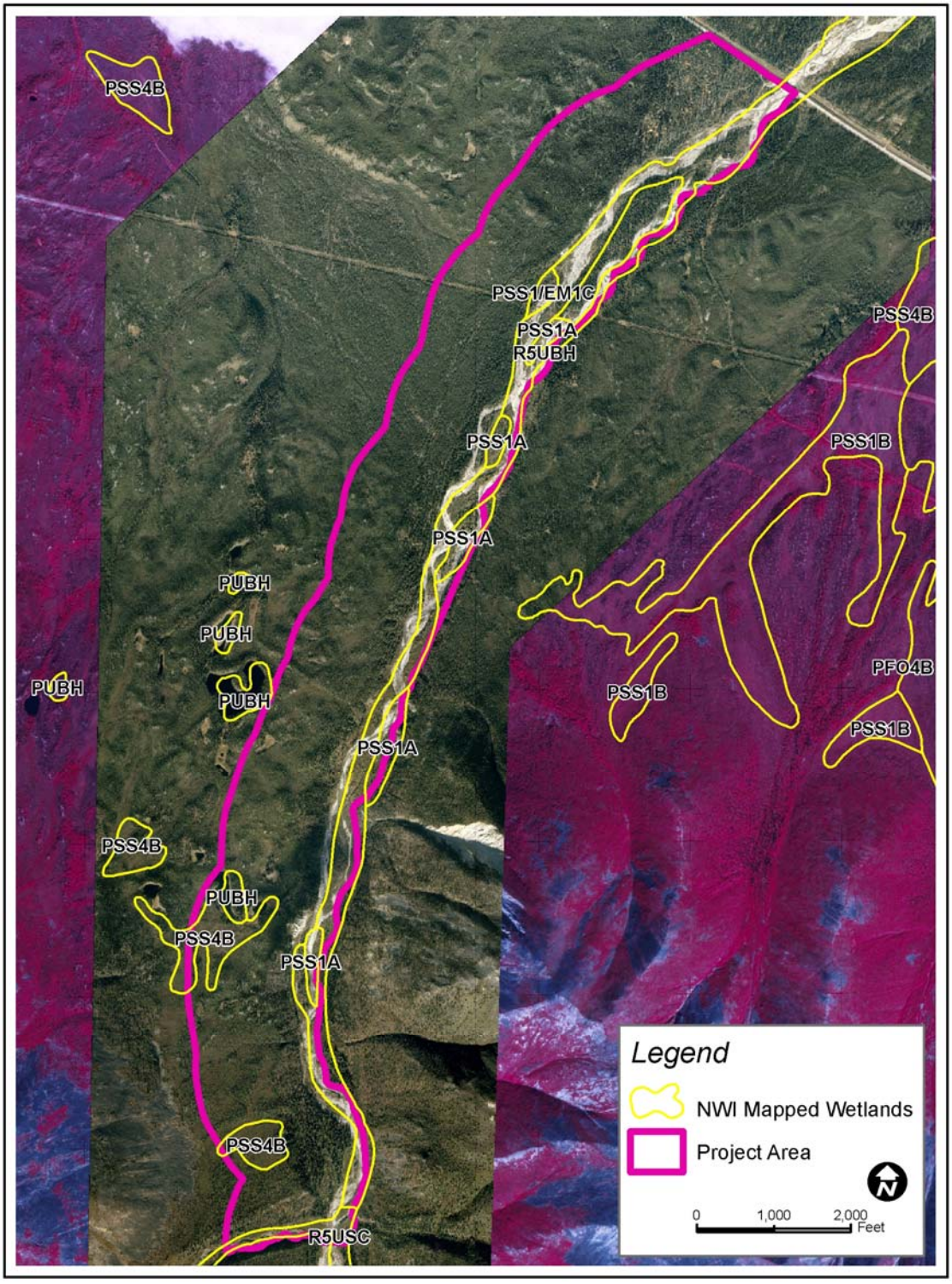
Vegetation clues: On aerial photography, scientists looked for saturation-adapted vegetation communities, indicative canopy structure and height, and presence of hydrophytic plant species. A common example is dwarf spruce trees, which are indicative of a limitation to growth such as excessively wet soils.

Evidence of soil saturation: Visible evidence of wetland hydrology was sought, including surface water and darker areas of photos indicating surface saturation. A site's proximity to streams, open water habitat, and marshes may be indicative of shallow subsurface water.

Existing mapping: Wetland mapping from the U.S. Fish and Wildlife's National Wetland Inventory mapping program is available for the project area (USFWS 2006). This mapping is generally an effective tool for large-scale planning and analysis of wetlands but not suitable for smaller site-specific projects such as needed for this study. NWI mapping is primarily based on aerial photographic interpretation with limited ground truthing, and therefore wetland boundaries tend to be oversimplified with many smaller wetland complexes not included in the mapping. According to available NWI mapping for USGS quadrangle Tanacross B-6, wetlands occur in the project area (Figure 3). Four pond polygons and two evergreen shrub polygons were mapped at the fringe of the project area, in mostly forested areas to the west of the creek channel. The main creek channel is mapped as riverine waters, with seven shrub polygons mapped on channel islands or on the edge of the main channel.

Areas with marginal evidence of wetland characteristics were mapped conservatively as wetlands. Preliminary JDs do not make legally binding determinations, therefore individual sites can be assessed at a later date if necessary (USACOE, June 2008).

Figure 3: NWI Mapping of Project Area



3. Results

No detailed vegetation or soil mapping was available for the project area prior to the field study. Information presented below is summarized from data collected at 28 wetland data form locations over the five-day field investigation (Appendix D). Locations of each data collection location are displayed on Figure 4. Of the 28 wetland data form locations, 6 were determined to occur in wetlands and 3 in other waters of the U.S.

Vegetation

At wetland data form locations, 15 out of the 28 sites had hydrophytic vegetation (Table 2). Dominant plant species are shown by stratum for each plot. The most common trees in the project area include white spruce (*Picea glauca*), balsam poplar (*Populus balsamifera*), and some paper birch (*Betula papyrifera*). The most common shrub is alder (*Alnus crispa*). Saplings of white spruce and cottonwood are also common in the shrub layer. Common graminoids include bluejoint reedgrass (*Calamagrostis canadensis*) and a variety of sedges (*Carex* spp.). Common forbs include timberberry (*Geocaulon lividum*) and dwarf fireweed (*Chamerion latifolium*). Mosses and lichens were found primarily in forested plots.

Table 2: Vegetation at Wetland Data Form Sites – Dominant Species per Plot

	Tree Stratum					**Shrub Stratum**							
	black spruce	felt-leaved willow	balsam poplar	paper birch	white spruce	bog kalmia	Labrador tea	black spruce	diamond willow	alder	dwarf birch	crowberry	red currant
	Picea mariana	*Salix alexensis*	*Populus balsamifera*	*Betula papyrifera*	*Picea glauca*	*Andromeda polifolia*	*Ledum groenlandicum*	*Picea mariana*	*Salix pulchra*	*Alnus crispa*	*Betula glandulifera*	*Empetrum nigrum*	*Ribes triste*
Plot Number	**FACW**	**FAC**	**FACU**	**FACU**	**FACU**	**OBL**	**FACW**	**FACW**	**FACW**	**FAC**	**FAC**	**FAC**	**FAC**
101	1						1				1		
103					1		1						
104										1			
105										1			
106										1			
107			1		1					1			1
108										1			
109			1							1			
110		1								1			
116			1		1					1			
118									1				
119													
120													
121				1	1					1			
122				1	1					1			
124										1			
125			1		1					1			
126								1				1	
128						1							
130	1						1						
132				1	1					1			
133										1			
134			1		1					1			
135										1			
136										1			
137			1							1			
138					1					1			
139					1								

Table 3, continued

	Shrub Stratum						Herbaceous Stratum					
	bog blueberry	lingonberry	bunchberry dogwood	white spruce	balsam poplar	prickly rose	boreal bog sedge	NT sedge	water sedge	marsh five-finger	marsh horsetail	Biglow's sedge
	Vaccinium uliginosum	*Vaccinium vitis-idaea*	*Cornus canadensis*	*Picea glauca*	*Populus balsamifera*	*Rosa acicularis*	*Carex magellanica*	*Carex utriculata*	*Carex aquatilis*	*Comarium palustris*	*Equisetum pratense*	*Carex biglowii*
Plot Number	**FAC**	**FAC**	**FACU**	**FACU**	**FACU**	**FACU**	**OBL**	**OBL**	**OBL**	**OBL**	**FACW**	**FAC**
101	1											1
103	1	1										
104												
105												
106												
107												
108												
109					1							
110												
116				1								
118								1		1		
119			1			1						
120								1	1			
121												
122					1							
124					1							
125												
126												
128							1		1			
130									1			
132					1							
133												
134												
135					1							
136					1							
137												
138											1	
139				1								

Table 4, continued

	Herbaceous Stratum										
	bluejoint reedgrass	fireweed	dwarf fireweed	Menzies' campion	common horsetail	timberberry	bluebells	boreal sagebrush	glaucous bluegrass	field locoweed	purple reedgrass
	Calamagrostis canadensis	*Chamerion angustifolium*	*Chamerion latifolium*	*Silene menziesii* ssp. *williamsii*	*Equisetum arvense*	*Geocaulon lividum*	*Mertensia paniculata*	*Artemisia arctica*	*Poa glauca*	*Oxytropis campestris*	*Calamagrostis purpurascens*
Plot Number	**FAC**	**FAC**	**FAC**	**FAC**	**FACU**	**FACU**	**FACU**	**NI**	**NI**	**NI**	**NI**
101											
103						1					
104			1					1			
105	1										
106	1										
107	1							1			
108			1								
109	1		1								
110	1										
116	1										
118	1										
119	1										
120											
121						1	1				
122						1					
124	1										
125						1					
126	1				1						
128											
130						1					
132		1									
133	1		1								
134	1					1					
135			1	1							1
136	1								1	1	1
137	1										
138	1					1	1				
139						1					

Hydrology

The project area is situated along the valley bottom and slopes of the Yerrick Creek drainage. Yerrick Creek experiences a declining flow along the surveyed length due to subterranean flow. The unusually high precipitation and storm events in July filled channels that normally do not experience flow, and in some cases, likely did not experience any flow for over 20 years, according to observations of persons familiar with the study area. Hydrological indicators were carefully examined at plot data collection locations that occurred in side channels to ensure that data collected was not influenced by conditions deviating from normal. All efforts were made by wetland scientists to consider normal conditions despite the unusual weather conditions preceding the field data collection time.

At wetland data form locations, 13 out of the 28 sites had wetland hydrology (Table 3). Commonly seen primary indicators included surface water, saturation, high water table, and drift deposits. Common secondary indicators included drainage patterns, geomorphic position, stunted or stressed plants, and FAC-neutral test.

Table 5: Indicators at Wetland Data Form Sites with Wetland Hydrology

	Field Observations			Primary Wetland Hydrology Indicators							Secondary Wetland Hydrology Indicators							
Plot Number	Surface Water Depth (inches)	Water Table Depth (inches)	Saturation Depth (inches)	Surface Water (A1)	High Water Table (A2)	Saturation (A3)	Water Marks (B1)	Sediment Deposits (B2)	Drift Deposits (B3)	Inundation Visible on Aerial Image (B7)	Water Stained Leaves (B9)	Drainage Patterns (B10)	Presence of Reduced Iron (C4)	Stunted or Stressed Plants (D1)	Geomorphic Position (D2)	Shallow Aquitard (D3)	Microtopographic relief (D4)	FAC Neutral Test (D5)
101	0-10	11	5	X	X	X	X									X	X	X
104	0-24	0	0	X	X	X			X	X		X		X	X			
105								X	X		X	X			X			
108	0-24	0	0	X	X	X		X	X	X		X		X	X			
109								X	X			X						
118	12	0	0	X														
119									X									
120	2	0	0	X	X	X					X		X					X
126		11	6		X	X								X	X			X
128	4	0	0	X	X	X				X				X	X			X
129	0	8	4	X		X												X
133								X	X			X						
136									X									

Soils

Both hydric and non-hydric soil conditions were observed in soil pits examined during the field visit. Soils were carefully assessed by wetland scientists to consider soils under normal conditions, despite the unusual rainfall of the season. Hydric soils were encountered at 6 of the 28 wetland data form sites (Table 4). Indicators of hydric soil included histosol, histic

epipedons, and several other indicators that fell under problematic soil conditions. Analysis of conditions at all sites with problematic hydric soils that are listed in Table 4 concluded that the site did contain a hydric soil as per USACE direction (USACE 1987, 2007). Specific characteristics of the sampled mineral soils, including color and texture, are included on the wetland data forms (Appendix D).

Table 6: Soils at Wetland Data Form Sites Found to Have Hydric Soils

	Hydric Soil Indicators				
Plot Number	Histosol or Histel (A1)	Histic Epipedon (A2)	Restrictive Layer Type	Restrictive Layer Depth (inches)	Other Indicator of Hydric Soils or "Waters" Status
101	X		Permafrost	16	
104					Outwash, Entisol (Substrate too young and coarse to show redox features and with too little organic carbon to promote reduction)
108					Outwash, Entisol (Substrate too young and coarse to show redox features and with too little organic carbon to promote reduction)
118					No pit, emergent vegetation and 12" standing water present
120					Hydrophytic vegetation, primary hydrology indicator, concave landscape, positive alpha-alpha dipyridyl
126	X				
128	X				
130		X			

4. Conclusion

Wetland locations are based upon the dominance of hydrophytic vegetation, hydrologic indicators, and hydric soil indicators. Other waters of the U.S. are based on the investigators' judgement about the location of the ordinary high water mark of Yerrick Creek. Based on the findings above, it has been determined that areas displayed as wetlands or waters on Figure 4 meet the USACOE criteria for being classified as wetland or fall below the plane of Ordinary High Water (OHW) of Yerrick Creek. Approximately 21.3% (147.1 acres), a conservative delineation, of the mapped acres were determined to meet the USACOE requirements for being classified as wetlands or other waters, and are listed and described in Table 5. The areas shown as wetlands and other waters on Figure 4 may be subject to jurisdiction under Section 404. For the purpose of this PJD, it is assumed that Yerrick Creek is a Relatively Permanent Tributary to Traditional Navigable Waters, and that the mapped wetlands are "adjacent" to Yerrick Creek. Most of the mapped wetland areas are not within the proposed project construction areas.

The remainder of the mapped project area, approximately 78.7% (542.6 acres) of the mapped area, lacks one or more of the required three parameters to support classifying an area as wetland (Table 5), and is not below the plane of OHW of Yerrick Creek. The areas would not be subject to jurisdiction under Section 404. As project plans are developed, if construction would affect wetlands or other waters, AP&T may wish to refine wetland boundaries by further field investigation and consideration of the jurisdictional status of any affected wetlands.

Yerrick Creek and its adjacent active bars are waters of the US below the creek's OHW mark. OHW is particularly difficult to define for a braided channel such as this one. There may be some areas within the river bars shown on Figure 4 that are not actually below OHW.

Table 7: Mapped Area Summary

Wetland Type	NWI Mapping Code	Approximate Area (Acres)
Seasonally flooded emergent persistent herbaceous wetland	PEM1C	0.51
Semipermanently flooded emergent persistent herbaceous wetland	PEM1F	3.89
Saturated needle-leafed evergreen forest/broad-leafed scrub-shrub wetland	PF04/SS3B	5.07
Saturated needle-leafed evergreen forest wetland	PFO4B	0.68
Seasonally flooded broad-leafed scrub-shrub wetland	PSS1C	0.10
Saturated broad-leafed evergreen/needle-leaved scrub-shrub wetland	PSS3/4B	42.24
Seasonally flooded broad-leafed evergreen scrub-shrub/persistent herbaceous wetland	PSS3/EM1B	0.64
Seasonally flooded broad-leafed evergreen scrub-shrub wetland	PSS3B	0.37
Seasonally flooded broad-leafed evergreen/broad-leafed evergreen scrub-shrub wetland	PSS4/3B	5.92
Saturated needle-leafed evergreen scrub-shrub wetland	PSS4B	14.33
Permanently flooded unconsolidated bottom palustrine wetland	PUBH	3.35
Temporarily flooded upper perennial unconsolidated floor/permanently flooded unconsolidated bottom wetland	R3USA/UBH	69.96
Upland (non-wetland)	U	542.56
	Total Mapped Area	**689.63**
	Total Wetlands and Other Waters	**147.1 acres (21.3%)**
	Total Upland (non-wetland)	**542.6 acres (78.7%)**

Determination Made By

Elizabeth Bella, Chris Wrobel, and Irina Lapina
Wetland Scientists
HDR Alaska, Inc.
Date: February 2008

Attachments

Figure 4: Yerrick Creek Wetlands Map Book

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Appendices

Appendix A: Weather and Climate Data

http://www.arh.noaa.gov/climate.php
NOAA National Weather Service Alaska Regional Headquarters Data
Period of Record:1946 to 2008

Day 2008	Observed (°F)		Observed	Extreme Temperature (°F)							
	Max Temp:	Min Temp:	Precipitation (inches):	Highest Max:		Lowest Max:		Highest Min:		Lowest Min:	
1-Jun	63	47	0	87	1958	44	1947	57	1990	31	1969
2-Jun	69	47	0	80	1958	44	1947	57	1979	32	1947
3-Jun	67	49	T	85	1958	44	1974	57	1957	32	1974
4-Jun	61	49	T	84	1957	40	2006	56	1985	27	1961
5-Jun	61	49	0	85	1957	44	1963	60	1958	26	2006
6-Jun	64	44	T	84	1951	49	1985	60	1986	31	1963
7-Jun	66	49	0.01	84	1958	52	1983	57	1965	36	1991
8-Jun	67	48	T	84	1946	51	1970	55	1969	30	1992
9-Jun	56	45	0.09	83	1947	50	1983	56	2006	32	1961
10-Jun	62	47	0.02	79	1971	52	1959	60	2006	34	1991
11-Jun	63	44	T	80	1972	52	1955	56	2005	35	1987
12-Jun	61	48	0.32	81	1992	52	1979	56	2005	36	1960
13-Jun	68	44	0	85	1972	48	1952	59	1969	36	1955
14-Jun	69	47	0	91	1969	45	1954	58	1972	37	1971
15-Jun	71	48	0.36	91	1969	50	1985	60	1950	32	1960
16-Jun	64	48	0.08	81	1948	52	1985	58	1968	36	1960
17-Jun	59	50	T	88	1948	56	1982	58	1946	40	1987
18-Jun	67	52	0.01	86	1967	52	1980	62	1948	36	1982
19-Jun	69	55	0.09	82	1958	51	1949	58	1967	35	1960
20-Jun	75	50	0	88	1958	53	2005	58	1958	41	1951
21-Jun	M	M	M	90	1991	47	1956	58	1969	33	1968
22-Jun	72	55	T	82	1987	50	2006	60	1969	38	1993
23-Jun	61	50	0.56	85	1971	50	1963	57	1983	33	1949
24-Jun	57	48	0.28	90	1991	50	1964	58	1971	39	1961
25-Jun	M	M	M	86	1983	44	1949	60	1980	35	1949
26-Jun	M	M	M	83	1991	50	1949	63	1983	34	1949
27-Jun	M	M	M	85	1957	49	1949	65	1969	36	1960
28-Jun	M	M	M	81	1986	8	1971	68	1968	-11	1971
29-Jun	M	M	M	85	1992	48	1949	70	1968	34	1949
30-Jun	M	M	M	87	1992	47	1971	64	1987	35	1971
JUNE 2008 AVERAGE	**64.87**	**48.39**	**Total: 1.82**								
JUNE NORMAL	**71**	**40**	**2.12**								
1-Jul	M	M	M	83	1991	47	1945	58	1985	32	1971
2-Jul	M	M	M	82	1990	55	1981	60	1958	34	1960
3-Jul	80	48	T	85	1958	57	1969	62	1955	36	1961
4-Jul	82	53	T	91	1958	57	1959	62	1990	37	1961

5-Jul	79	53	T	86	1990	55	1949	62	1968	44	1960
6-Jul	72	58	0.07	84	1986	57	1981	63	1980	41	1963
7-Jul	70	53	0.01	82	1982	54	1981	60	1986	42	1993
8-Jul	55	49	0.23	85	1951	54	1981	62	1968	43	1992
9-Jul	68	50	0.01	82	1946	54	1957	60	1968	38	1991
10-Jul	69	52	0.08	88	1975	54	1964	59	1989	36	1960
11-Jul	68	53	0.15	85	1975	48	1954	60	1980	35	1960
12-Jul	73	52	0.01	89	1960	55	1962	59	1980	38	1990
13-Jul	68	52	0.04	85	1960	55	1959	60	1975	36	1961
14-Jul	58	51	0.13	85	1967	53	1971	64	1989	38	1961
15-Jul	71	46	0.01	85	1993	57	1960	62	1954	42	1991
16-Jul	72	52	0	88	1951	53	1955	60	1993	38	1960
17-Jul	63	49	0.27	83	1993	47	2003	62	1947	38	2003
18-Jul	51	46	0.53	79	1993	51	2008	57	1988	39	1961
19-Jul	58	45	T	84	1990	52	1965	59	1978	41	1966
20-Jul	56	47	0.1	85	1990	51	1973	59	1990	38	1968
21-Jul	64	45	0.27	81	1976	51	1956	60	2006	42	1959
22-Jul	55	42	0.16	83	1955	54	1959	61	1952	40	1968
23-Jul	58	44	T	86	1990	58	2008	60	1961	42	1971
24-Jul	67	43	T	86	1990	52	1965	62	1990	38	1988
25-Jul	62	49	T	90	1955	49	1969	60	1947	40	1991
26-Jul	68	50	0.54	85	1955	48	1957	59	1978	40	1961
27-Jul	55	49	0.41	86	1953	53	1963	63	1977	39	1957
28-Jul	51	44	2.27	83	1953	8	1971	62	1958	-11	1971
29-Jul	59	43	0.36	85	1977	59	2008	60	1962	38	1975
30-Jul	53	46	0.28	88	1977	53	2008	62	1947	42	1971
31-Jul	48	44	0.75	85	1978	48	2008	58	1965	35	1968
JULY 2008 AVERAGE	**63.9**	**48.55**	**Total: 6.68**								
JULY NORMAL	**73**	**43**	**2**								
1-Aug	60	45	0.1	87	1976	56	1982	64	1993	34	1968
2-Aug	70	44	0.3	79	1962	56	1971	64	1953	35	1948
3-Aug	54	44	0.13	82	1977	50	2003	59	1986	40	1964
4-Aug	M	M	M	88	1977	49	1947	60	1986	36	1968
5-Aug	M	M	M	80	1968	56	1962	62	1977	34	1946
6-Aug	M	M	M	86	1968	54	1949	60	1981	33	1946
7-Aug	M	M	M	85	1968	45	1969	58	1981	33	1969
8-Aug	49	41	0.03	79	1977	42	1969	61	1981	33	1969
9-Aug	53	37	0.01	82	1957	53	2008	62	1977	34	1969
10-Aug	M	M	M	85	2005	43	1969	63	1979	29	1969
11-Aug	61	44	0.05	86	1980	50	1965	59	1945	33	1969
12-Aug	68	35	0	84	1980	46	1969	59	1958	33	1969
13-Aug	66	49	0	85	1990	48	1973	66	1975	29	1969
14-Aug	71	45	T	86	1990	45	1946	57	1991	26	1969
15-Aug	67	50	T	85	1990	50	1983	64	1979	27	1969
16-Aug	67	46	0.04	84	1957	42	1981	64	1979	36	1981
17-Aug	59	49	0.11	80	2007	48	1946	63	1990	28	1981

18-Aug	M	M	M	81	1977	53	1992	56	1977	32	1947
19-Aug	60	45	T	81	1950	51	1987	57	2007	35	2005
20-Aug	59	42	0	81	1973	49	1981	55	1950	33	1946
21-Aug	62	37	T	86	1977	42	1946	56	1972	31	1974
22-Aug	64	49	0.02	84	1977	41	1948	56	1963	30	1989
23-Aug	M	M	M	79	1979	44	1948	57	1989	25	1986
24-Aug	58	39	T	82	1979	45	1983	55	1963	22	1948
25-Aug	60	43	0	80	1981	45	1983	57	1989	31	1993
26-Aug	62	38	0	78	1981	38	1984	57	1989	27	1991
27-Aug	M	M	M	80	1981	40	1984	61	1957	29	1991
28-Aug	62	41	T	82	1949	8	1971	63	1989	-11	1971
29-Aug	M	M	M	82	1949	40	1984	51	1951	28	1991
30-Aug	60	38	0	85	1974	40	1948	56	1949	25	1955
31-Aug	M	M	M	77	1974	42	1962	49	1993	23	1987
AUGUST 2008 AVERAGE	**61.52**	**42.9**	**Total = 0.79**								
AUGUST NORMAL	**68**	**39**	**1.2**								

http://www.wrcc.dri.edu/summary/Climsmak.html

Western Regional Climate Center, wrcc@dri.edu

Monthly Climate Summary for Tok, AK

Period of Record : 6/11/1954 to 12/31/2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	-6.6	7.7	25	44	60.4	71	73	68	54	32	8.9	-3.5	36.2
Average Min. Temperature (°F)	-25	-16	-6	16	29.5	40	43	39	29	13	-9.9	-22	10.8
Average Total Precipitation (inches)	0.35	0.3	0.2	0.2	0.7	2.1	2	1.2	0.8	0.6	0.5	0.43	9.22

Appendix B: Summary Table

Plot Number	Plot Type	JD Status	NWI Code	Photo Numbers
101	JD	W	PSS3/4C	124-pit, 125-surface, 126-W, 127-E, 128-S
102	PP-RW*	W	R4SBH	129-W, 130-E
103	JD	U	U	131-pit, 132-surface, 133-E, 134-W, 135-S
104	JD	W	R3UB1/2H	136-N, 137-E, 138-S, 139-W
105	JD	U	U	144-N, 145-S, 146-pit, 147-surface
106	JD	U	U	148-pit, 149-surface, 150-E, 151-SW, 152-N
107	JD	U	U	153-pit, 154-surface, 155-N, 156-S
108	JD	W	R3US1/2C	157-W, 158-N, 159-E, 160-S, 161-SW
109	JD	U	U	162-N, 163-SE, 164-SW, 165-NW, 166-pit, 167-surface
110	JD	U	U	168-pit, 169-surface, 170-SE, 171-S, 172-N
111	PP-RU	U	U	173-SW, 174-NW, 175-NE
112	PP-RW	W	R3UB2H	180-channel, 181-channel
113	PP-RU	U	U	182-NW, 183-SE, 184-SE-channel, 185-N
114	PP-RU	W	R3UBH	186-NW, 187-SE
115	PP-RW	W	R4SB2C	188-N, 189-S
116	JD	U	U	190-pit, 191-surface, 192-N, 193-S
117	PP-RW	W	R4UBF	194-NW, 195-SE
118	JD	W	PEM1F (Center of polygon is PUBH)	196-water, 197-E, 198-W, 199-pond
119	JD	U	U	200-pit, 201-surface, 202-NE, 203-N, 204-hydro
120	JD	W	PEM1F	205-pit, 206-redox, 207-alpha-alpha, 208-E, 209-W
121	JD	U	U	210-N, 211-S, 212-pit, 213-surface
122	JD	U	U	216-N, 217-S, 218-pit, 219-surface
123	PP-RW	W	R3UB1/2H (Gravel Bar is R3US1/2C or A)	220-NE, 221-SW, 222-S
124	JD	U	U	226-NE, 227-SW, 228-SE, 229-pit, 230-surface
125	JD	U	U	233-N, 234-S, 235-windthrow, 236-pit, 237-surface
126	JD	W	PSS4B	238-N, 239-N, 241-pit, 242-surface
127	PP-RW	U	U	243-N, 244-S, 245-pit
128	JD	W	PEM1/SS3C (PEM1C adjacent)	246-N, 247-S, 248-water
129	PP-RW	W	PUBH (PEM1C on fringe)	249-NE, 250-W, 251-W
130	JD	W	PF04/SS3B	252-NE, 253-SW, 254-pit, 255-surface
131	PP-RW	W	PF04/SS3B	256-N, 257-S, 260-pit, 261-surface
132	JD	U	U	262-NE, 263-SE, 264-S, 267-pit, 268-surface
133	JD	U	U	269-NE, 270-SE, 271-SW
134	JD	U	U	272-NE, 273-SW, 274-pit, 275-surface
135	JD	U	U	277-NE, 278-SE, 279-SW
136	JD	U	U	280-N, 281-SW (cliff), 282-SW, 283-pit, 284-surface
137	JD	U	U	292-NE, 293-SW, 294-pit, 295-surface
138	JD	U	U	297-N, 298-S, 299-pit, 300-surface
139	JD	U	U	305-N, 306-W, 307-S, 310-pit, 311-surface
140	PP-RU	U	U	312-NE, 313-SW

*PP-RW or PP-RU: Photopoint Plot at a Representative Wetland or Waters (RW) or a Representative Upland (RU) site, where photos and basic information are recorded instead of the entire field form, due to similarity in site conditions with previously surveyed plots.

Appendix C: Photographs

Included as a Word document:
AppendixC_photos_yerrick.doc

Appendix D: Field Data Forms

Included as an Adobe document:
AppendixD_plotfieldforms_yerrick.pdf

9.3.5. – HERITAGE RESOURCE SURVEY

(Report has sensitive information and is not available to the general public)

Office of History and Archaeology: Cultural Resources Report Coversheet

(Must Accompany All Compliance Reports Submitted to OHA/SHPO)

Office of History and Archaeology
Division of Parks & Outdoor Recreation
Alaska Department of Natural Resources
550 W. 7th Ave., Suite 1310
Anchorage, AK 99501-3565
Phone: (907) 269-8721 Fax (907) 269-8908
http://www.dnr.state.ak.us/parks/oha/index.htm

Was this survey/investigation(Check one): ***Negative*** [ ] ***Positive*** [X]

Negative = no cultural resource sites are reported or updated. Positive = cultural resource sites are reported or updated.

*Note: Alaska Heritage Resources Survey (AHRS) numbers are **required** for reported cultural resource sites, including buildings. AHRS numbers can be obtained by contacting Joan Dale at 907-269-8718).*

Project/Report Information:

- Report Title: ***2009 Cultural Resource Survey of Alaska Power & Telephone's Yerrick Creek Hydroelectric Project near MP 1334 of the Alaska Highway, Alaska***
- Report Author(s): ***Molly Proue, M.A., R.P.A., and Burr Neely, M.A., R.P.A.***
- Report Date: ***November 2009***
- Submitting Organization/Agency ***Northern Land Use Research, Inc.***
- Project Name and Project Number: ***09-968 Yerrick Creek Hydroelectric Project***
- Principal Investigator (PI) name: ***Peter M. Bowers, M.A., R.P.A.***

Geographic Information (attach an extra sheet or cite report page numbers if necessary)

- USGS Mapsheet (1:63,360 if available) ***Tanacross B-6***
- Meridian/Township / Range / Section (MTRS) location: (all affected sections)

Format example: "F021N018E|13-14" ***C019N009E, Section 36; C018N009E, Sections 1, 2, 11, and 14***

- Verbal description of survey area

(for example: "123 Acme Street," "confluence of Fish and Moose creeks," "Milepost 9-16 …"

The middle portion of the Yerrick Creek drainage, south of the Alaska Highway, 22 miles west of Tok.

- Does this report contain boundary coordinates for the surveyed area? Yes [ ] No [X] Page #(s) _____
- Does this report contain boundary coordinates for reported sites? Yes [ ] No [X] Page #(s) _____
- Land owner(s): State of Alaska and Tanacross Native Corp.
- Answer one: Acres Surveyed 127 Hectares Surveyed _____

Cultural Resources Management (CRM) Information

- List AHRS numbers of <u>new</u> and <u>updated</u> sites – (do not list sites that are merely described in the background section).
  TNX-211 and TNX-212
- Is the report part of a National Historic Preservation Act - Section 106 consultation? Yes [X] No [ ]
- Is the report part of an Alaska Historic Preservation Act compliance consultation? Yes [ ] No [X]
- Does the report's data support a submitting agency's determination of eligibility? Yes [X] No [ ]
- Does the report's data support a submitting agency's determination of effect? Yes [X] No [ ]
- Was this report submitted to fulfill State Field Archaeology Permit requirements?
  Permit No.: **Permit Application # 2009-27** Yes [X] No [ ]
- Was this project and/or report overseen or authored by someone meeting the minimum qualifications of the Sec. of the Interior's Standards and Guidelines (48 FR 44738-44739)? Yes [X] No [ ]
- Is the Principal Investigator's resume' appended to the report or on file at OHA? Yes [X] No [ ]

9.4 2009 Denali Commission List of Distressed Communities

Denali Commission
510 L Street, Suite 410
Anchorage, AK 99501

907.271.1414 *tel*
907.271.1415 *fax*
888.480.4321 *toll free*
www.denali.gov

Issue: **Distressed Community Criteria 2009 Update**

Date: **June 2009**

Background:

This 2009 annual update of the distressed community list prepared by the Alaska Department of Labor and Workforce Development, Research and Analysis Section, uses the most current population, employment and earnings data available to identify those Alaska communities considered "distressed". The distressed status is determined by comparing average income of a community to full-time minimum wage earnings, the percentage of the population earning greater than full-time minimum wage earnings and a measure of the percentage of the population engaged in year-round wage and salary employment.

More Community Data Available

This report uses enhanced physical place of residence information to better identify the community of residence for Permanent Fund Dividend applicants age 16 and over. Communities included in this report are closely aligned with those used in the annual population place estimates prepared by the Alaska Department of Labor and Workforce Development.

Attached is a list of Alaska communities with employment and earnings information used to determine their distressed community status for 2009. Maps by economic region that show locations of communities that meet the distressed criteria are also included.

Surrogate Standard Background

The Denali Commission adopted alternate methods of determining community eligibility when census data were not available for the 2000 update. That "surrogate" standard considered additional data and methodology. For this 2009 update, we compiled the data required to implement a "surrogate" standard to determine eligibility.

Data Sources and Methodology

Three sources of data are used for the 2009 update:

- 2008 Permanent Fund Dividend applications (PFD). This information includes the applicant's age, social security number (SSN), and physical place of residence.
- Alaska unemployment insurance wage records for calendar year 2008. This information includes wage and salary worker earnings from all

private, state and local government employers. Federal government, military, and self-employed earnings are not available and not included in the earnings estimate.
- Calendar year 2007 Commercial Fisheries Entry Commissions (CFEC) total fish value data by community, the most recent data available.

All 2008 PFD applicants age 16 and over in 2008 were assigned to an Alaska borough/census area and community by place of residence. PFD applicants age 16 and over were matched with wage and employment information by SSN. CFEC 2007 total fish values were added to wage and salary earnings to compute community average market income.

2009 Update Surrogate Standard

A community that meets two of the following three surrogate standard criteria is considered distressed:

***Criteria 1* Average market income in 2008 is less than $14,872.**

$$\text{Average market income} = \frac{\text{Community UI Earnings + Community CFEC Earnings}}{\text{Number Residents 16 and Over}}$$

$$\$14{,}872 = \text{Minimum Wage (\$7.15/hour x 2,080 hours/year)}$$

Any community with an average market income of less than $14,872 in 2008 meets this criteria.

***Criteria 2* More than 70% of residents 16 and over earned less than $14,872 in 2008.**

$$\text{Percent Residents w/Earnings < than \$14,872} = 100 \times \frac{\text{Number Residents w/Earnings < than \$14,872}}{\text{Number Residents 16 and Over}}$$

Any community with more than 70% of its residents earning less than $14,872 in 2008 meets this criteria.

***Criteria 3* Less than 30% of residents 16 and over worked all four quarters of 2008.**

$$\text{Percent Residents Employed All 4 Quarters} = 100 \times \frac{\text{Number Residents Employed All 4 Quarters}}{\text{Number Residents 16 and Over}}$$

Any community with less than 30% of its residents employed all four quarters of 2008 meets this criteria.

Appeals

The Denali Commission recognizes that in some cases the data collection and application methodology does not accurately reflect the appropriate classification of some communities. Therefore, the Commission is open to reviewing a community's classification as "non-distressed." Any community that believes a "non-distressed" classification was determined in error may appeal to the Denali

Commission. Appeals determinations will be made in lieu of new information (relevant economic data and facts) which demonstrate the data compiled by the DOL&WD was erroneous, invalid, or outdated. Additionally, the Commission will take into consideration the past economic status of a community as determined by the Denali Commission's annual Distressed Community Criteria lists dating back to 2002. Past economic statuses will not, however, be the single determining factor for successful appeals. They will be considered in addition to the new information provided. New information must come from a verifiable source and be robust and representative of the entire community and/or population.

In addition to demonstrating the data compiled by the DOL&WD was erroneous, invalid, or outdated, the new information must demonstrate a community does meet at least two of the three Surrogate Standard criteria as defined above for classification as a distressed community.

Appeals must be sent in writing to the attention of the Denali Commission Director of Programs who will make an appeal determination based on the new verifiable information presented and will provide a response in writing within 30 days.

Send appeals to:
Denali Commission
Attention: Director of Programs
510 L Street, Suite 410
Anchorage, AK 99501

**The last section of the "Communities that meet 2009 Distressed Criteria" below contains the names of communities which have successfully appealed their status as "non-distressed" and received a "distressed" classification from the Commission.*

Distressed Communities as Defined by Surrogate Standard
The following is a list of communities that meet the surrogate standard for distressed communities.

Communities that meet 2009 Distressed Criteria
AKHIOK CITY
AKIACHAK CDP
AKIAK CITY
ALAKANUK CITY
ALATNA CDP
ALCAN BORDER CDP
ALEKNAGIK CITY
ALENEVA CDP
ALLAKAKET ANVSA
AMBLER CITY

Communities that meet 2009 Distressed Criteria

ANGOON CITY
ANVIK CITY
ARCTIC VILLAGE CDP
ATMAUTLUAK CDP
BELUGA CDP
BETTLES CITY
BIG DELTA CDP
BIRCH CREEK CDP
BREVIG MISSION CITY
CENTRAL CDP
CHALKYITSIK CDP
CHASE CDP
CHEFORNAK CITY
CHEVAK CITY
CHICKEN CDP
CHIGNIK LAGOON
CHIGNIK LAKE
CHINIAK CDP
CHISANA
CHITINA CDP
CHUATHBALUK CITY
CIRCLE CDP
CLAM GULCH CDP
CLARKS POINT CITY
COOPER LANDING CDP
COVENANT LIFE CDP
CROOKED CREEK CDP
CROWN POINT CDP
DOT LAKE CDP
DRY CREEK CDP
EAGLE CITY
EAGLE VILLAGE
EDNA BAY
EEK CITY
EIELSON AFB
EKWOK CITY
ELFIN COVE CDP
ELIM CITY
EMMONAK CITY
EXCURSION INLET CDP
FERRY CDP
FORT GREELY CDP
FOX RIVER CDP
FUNNY RIVER CDP
GAMBELL CITY

Communities that meet 2009 Distressed Criteria

GAME CREEK CDP
GLACIER VIEW CDP
GOODNEWS BAY CITY
GRAYLING CITY
GULKANA CDP
GUSTAVUS CDP
HALIBUT COVE CDP
HAPPY VALLEY CDP
HARDING-BIRCH LAKES CDP
HEALY LAKE CDP
HOBART BAY CDP
HOLLIS CDP
HOLY CROSS CITY
HOOPER BAY CITY
HOPE CDP
HUSLIA CITY
HYDABURG CITY
HYDER CDP
KAKE CITY
KALTAG CITY
KARLUK CDP
KASIGLUK CDP
KENNY LAKE CDP
KIPNUK CDP
KIVALINA CITY
KLUKWAN CDP
KODIAK STATION CDP
KOKHANOK CDP
KOLIGANEK CDP
KONGIGANAK CDP
KOTLIK CITY
KOYUK CITY
KOYUKUK CITY
KUPREANOF CITY
KWETHLUK CITY
KWIGILLINGOK CDP
LAKE LOUISE CDP
LAKE MINCHUMINA CDP
LIVENGOOD CDP
LOWER KALSKAG CITY
LUTAK CDP
MANLEY HOT SPRINGS CDP
MANOKOTAK CITY
MARSHALL CITY
MCCARTHY CDP

Communities that meet 2009 Distressed Criteria

MENTASTA LAKE CDP
MEYERS CHUCK
MINTO CDP
MOSQUITO LAKE CDP
MOUNTAIN VILLAGE CITY
MUD BAY CDP
NANWALEK CDP
NAPAKIAK CITY
NAUKATI BAY CDP
NELCHINA CDP
NEW STUYAHOK CITY
NEWTOK CDP
NIKOLAEVSK CDP
NIKOLAI CITY
NINILCHIK CDP
NONDALTON CITY
NOORVIK CITY
NORTHWAY CDP
NORTHWAY VILLAGE
NULATO CITY
NUNAM IQUA CITY
OLD HARBOR CITY
OUZINKIE CITY
PAXSON CDP
PELICAN CITY
PERRYVILLE CDP
PILOT STATION CITY
PITKAS POINT CDP
PLATINUM CITY
POINT BAKER CDP
POPE-VANNOY LANDING CDP
PORT ALEXANDER
PORT ALSWORTH CDP
PORT GRAHAM CDP
PORT PROTECTION CDP
PORTAGE CREEK CDP
QUINHAGAK CITY
RAMPART CDP
RED DEVIL CDP
RUBY CITY
RUSSIAN MISSION CITY
SAVOONGA CITY
SCAMMON BAY CITY
SELAWIK CITY
SELDOVIA CITY

Communities that meet 2009 Distressed Criteria

SHAGELUK CITY
SHISHMAREF CITY
SKWENTNA CDP
SLANA CDP
SLEETMUTE CDP
STEBBINS CITY
STEVENS VILLAGE CDP
STONY RIVER CDP
SUSITNA CDP
TANACROSS CDP
TATITLEK CDP
TELLER CITY
TENAKEE SPRINGS CITY
TETLIN CDP
THOMS PLACE
THORNE BAY CITY
TOGIAK CITY
TOKSOOK BAY CITY
TOLSONA CDP
TONSINA CDP
TRAPPER CREEK CDP
TULUKSAK CDP
TUNTUTULIAK CDP
TUNUNAK CDP
TWIN HILLS CDP
UGASHIK CDP
UPPER KALSKAG CITY
VENETIE CDP
WHALE PASS CDP
WHITESTONE CAMP CDP
WILLOW CREEK CDP
WISEMAN CDP
Y CDP

***Communities Classified as Distressed through the Appeals Process**

The following communities have successfully completed the appeals process and been reclassified by the Denali Commission as distressed communities:

HAINES	(Granted 2008)
GLENNALLEN	(Granted 2007)
CHENEGA	(Granted 2006)
NANWALEK	(Granted 2006)
ATMAUTLUAK	(Granted 2005)
GEORGETOWN	(Granted 2005)
KONGIGANAK	(Granted 2005)

MCGRATH	(Granted 2005)
NAPASKIAK	(Granted 2005)
NEWTOK	(Granted 2005)
OSCARVILLE	(Granted 2005)
SHAKTOOLIK	(Granted 2005)
BREVIG MISSION	(Granted 2005)
PORT GRAHAM	(Granted 2004)
NEWHALEN	(Granted 2001)

Communities that do not meet 2009 Distressed Criteria

ADAK CITY
AKUTAN CITY
ANAKTUVUK PASS CITY
ANCHOR POINT CDP
ANCHORAGE
ANDERSON CITY
ANIAK CITY
ATKA CITY
ATQASUK CITY
BARROW CITY
BEAR CREEK CDP
BEAVER CDP
BETHEL CITY
BIG LAKE CDP
BUCKLAND CITY
BUFFALO SOAPSTONE CDP
BUTTE CDP
CANTWELL CDP
CHENEGA CDP
CHICKALOON CDP
CHIGNIK CITY
CHISTOCHINA CDP
COFFMAN COVE CITY
COHOE CDP
COLD BAY CITY
COLDFOOT CDP
COLLEGE CDP
COPPER CENTER CDP
COPPERVILLE CDP
CORDOVA CITY
CRAIG CITY
DEERING CITY
DELTA JUNCTION CITY
DELTANA CDP
DIAMOND RIDGE CDP
DILLINGHAM CITY

Communities that do not meet 2009 Distressed Criteria

DIOMEDE CITY
DOT LAKE VILLAGE
EGEGIK CITY
ESTER CDP
EVANSVILLE CDP
FAIRBANKS CITY
FALSE PASS CITY
FARM LOOP CDP
FISHHOOK CDP
FORT YUKON CITY
FOUR MILE ROAD CDP
FOX CDP
FRITZ CREEK CDP
GAKONA CDP
GALENA CITY
GATEWAY CDP
GLENNALLEN CDP
GOLOVIN CITY
HAINES CDP
HEALY CDP
HOMER CITY
HOONAH CITY
HOUSTON CITY
HUGHES CITY
IGIUGIG CITY
ILIAMNA CITY
JUNEAU CITY
KACHEMAK CITY
KAKTOVIK CITY
KALIFORNSKY CDP
KASAAN CITY
KASILOF CDP
KENAI CITY
KETCHIKAN CITY
KIANA CITY
KING COVE CITY
KING SALMON CDP
KLAWOCK CITY
KNIK RIVER CDP
KNIK-FAIRVIEW CDP
KOBUK CITY
KODIAK CITY
KOTZEBUE CITY
LAKES CDP
LARSEN BAY CITY

Communities that do not meet 2009 Distressed Criteria

LAZY MOUNTAIN CDP
LEVELOCK CDP
LIME VILLAGE CDP
LOWELL POINT CDP
MCGRATH CITY
MCKINLEY PARK CDP
MEADOW LAKES CDP
MEKORYUK CITY
MENDELTNA CDP
METLAKATLA
MOOSE CREEK CDP
MOOSE PASS CDP
NAKNEK CDP
NAPASKIAK CITY
NELSON LAGOON CDP
NENANA CITY
NEWHALEN CITY
NIGHTMUTE CITY
NIKISKI CDP
NIKOLSKI CDP
NOATAK CDP
NOME CITY
NORTH POLE CITY
NORTHWAY JUNCION CDP
NUIQSUT CITY
NUNAPITCHUK CITY
OSCARVILLE CDP
PALMER CITY
PEDRO BAY CDP
PETERSBURG CITY
PETERSVILLE CDP
PILOT POINT CDP
PLEASANT VALLEY CDP
POINT HOPE CITY
POINT LAY CDP
POINT MACKENZIE CDP
PORT HEIDEN CITY
PORT LIONS CITY
PRIMROSE CDP
PRUDHOE BAY
RED DOG MINE CDP
RIDGEWAY CDP
SAINT GEORGE CITY
SAINT MARYS CITY
SAINT MICHAEL CITY

SAINT PAUL CITY
SALAMATOF CDP
SALCHA CDP
SAND POINT CITY
SAXMAN CITY
SELDOVIA VILLAGE CDP
SEWARD CITY
SHAKTOOLIK CITY
SHUNGNAK CITY
SILVER SPRINGS CDP
SITKA CITY
SKAGWAY CITY
SOLDOTNA CITY
SOUTH NAKNEK CDP
STERLING CDP
SUNRISE CDP
SUTTON-ALPINE CDP
TAKOTNA CDP
TALKEETNA CDP
TANAINA CDP
TANANA CITY
TAZLINA CDP
TOK CDP
TWO RIVERS CDP
TYONEK CDP
UNALAKLEET CITY
UNALASKA CITY
VALDEZ CITY
WAINWRIGHT CITY
WALES CITY
WASILLA CITY
WHITE MOUNTAIN CITY
WHITTIER CITY
WILLOW CDP
WOMENS BAY CDP
WRANGELL CITY
YAKUTAT

Communities that are determined distressed when plus/minus 3% formula* is applied to data.

The following is the list of criteria for communities that do not meet the 2009 surrogate standard for distressed communities.

Additional communities that meet distressed criteria when using plus/minus 3% formula

ANCHOR POINT CDP
ANDERSON CITY
BEAVER CDP
BUCKLAND CITY
COHOE CDP
DOT LAKE VILLAGE
FORT YUKON CITY
FRITZ CREEK CDP
HAINES CDP
HOMER CITY
HOONAH CITY
KACHEMAK CITY
KIANA CITY

Additional communities that meet distressed criteria when using plus/minus 3% formula
KOBUK CITY
LARSEN BAY CITY
LEVELOCK CDP
MCKINLEY PARK CDP
NAPASKIAK CITY
NENANA CITY
NIGHTMUTE CITY
NIKOLSKI CDP
NUNAPITCHUK CITY
POINT HOPE CITY
POINT MACKENZIE CDP
PORT LIONS CITY
SAINT MICHAEL CITY
SALCHA CDP
SELDOVIA VILLAGE CDP
SHUNGNAK CITY
SOUTH NAKNEK CDP
WALES CITY
WHITTIER CITY
WILLOW CDP
WRANGELL CITY

3% Criteria
Criteria 1 *Average earnings in 2008 from UI covered employment and fishing less than $14,872 x 1.03 = $15,318 (change from $14,872)*

Criteria 2 The percentage of residents 16 and over with 2008 earnings less than minimum wage of $14,872 greater than 67% (change from 70%)

<u>Criteria 3</u> The percentage of residents 16 and over employed in all four quarters of 2008 is less than 33% (change from 30%)

Distressed Community Status 2009, Alaska Communities by Borough/Census Area and Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
Aleutians East Borough						
AKUTAN CITY	Non-Distressed	Non-Distressed	28,396	41.9	72.0	
COLD BAY CITY	Non-Distressed	Non-Distressed	29,035	46.3	50.0	
FALSE PASS CITY	Non-Distressed	Non-Distressed	57,770	57.7	50.0	
KING COVE CITY	Non-Distressed	Non-Distressed	41,778	63.5	36.2	
NELSON LAGOON CDP	Non-Distressed	Non-Distressed	38,340	65.4	36.5	
SAND POINT CITY	Non-Distressed	Non-Distressed	47,564	64.0	38.1	
Aleutians West Census Area						
ADAK CITY	Non-Distressed	Non-Distressed	22,785	60.7	26.8	
ATKA CITY	Non-Distressed	Non-Distressed	25,377	46.9	63.3	
NIKOLSKI CDP	Non-Distressed	Non-Distressed	14,971	68.2	36.4	Yes
SAINT GEORGE CITY	Non-Distressed	Non-Distressed	19,695	66.2	33.8	
SAINT PAUL CITY	Non-Distressed	Non-Distressed	27,056	59.2	42.6	
UNALASKA CITY	Non-Distressed	Non-Distressed	40,743	33.8	67.1	
Anchorage Municipality						
ANCHORAGE	Non-Distressed	Non-Distressed	25,814	53.7	46.9	
Bethel Census Area						
AKIACHAK CDP	Distressed	Non-Distressed	11,477	75.1	27.8	
AKIAK CITY	Distressed	Non-Distressed	10,885	70.4	44.2	
ANIAK CITY	Non-Distressed	Non-Distressed	19,790	57.8	42.2	
ATMAUTLUAK CDP	Distressed	Distressed	7,875	80.9	23.0	
BETHEL CITY	Non-Distressed	Non-Distressed	28,323	47.8	49.0	
CHEFORNAK CITY	Distressed	Distressed	11,206	78.0	45.5	
CHUATHBALUK CITY	Distressed	Distressed	10,981	76.7	35.0	
CROOKED CREEK CDP	Distressed	Distressed	9,767	76.7	34.9	
EEK CITY	Distressed	Distressed	10,585	76.6	37.8	
GOODNEWS BAY CITY	Distressed	Distressed	12,293	76.4	29.7	
KASIGLUK CDP	Distressed	Distressed	9,131	80.0	36.5	
KIPNUK CDP	Distressed	Distressed	9,404	79.5	31.0	
KONGIGANAK CDP	Distressed	Distressed	8,975	81.0	35.4	
KWETHLUK CITY	Distressed	Distressed	9,523	76.0	30.1	
KWIGILLINGOK CDP	Distressed	Distressed	11,249	71.8	38.7	
LIME VILLAGE CDP	Non-Distressed	Distressed	11,676	64.3	35.7	
LOWER KALSKAG CITY	Distressed	Distressed	7,970	78.8	33.3	
MEKORYUK CITY	Non-Distressed	Non-Distressed	19,197	65.8	42.6	
NAPAKIAK CITY	Distressed	Distressed	9,049	79.2	40.7	
NAPASKIAK CITY	Non-Distressed	Distressed	10,889	69.9	37.7	Yes

Distressed Community Status 2009, Alaska Communities by Borough/Census Area and Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
NEWTOK CDP	Distressed	Distressed	8,396	80.7	43.6	
NIGHTMUTE CITY	Non-Distressed	Distressed	12,136	67.9	47.4	Yes
NUNAPITCHUK CITY	Non-Distressed	Distressed	12,205	69.6	46.1	Yes
OSCARVILLE CDP	Non-Distressed	Non-Distressed	21,932	48.3	62.1	
PLATINUM CITY	Distressed	Distressed	10,158	82.4	35.3	
QUINHAGAK CITY	Distressed	Distressed	11,186	75.6	33.2	
RED DEVIL CDP	Distressed	Distressed	7,895	86.7	23.3	
SLEETMUTE CDP	Distressed	Distressed	8,650	80.0	36.9	
STONY RIVER CDP	Distressed	Distressed	10,181	80.6	27.8	
TOKSOOK BAY CITY	Distressed	Distressed	12,693	75.4	40.3	
TULUKSAK CDP	Distressed	Distressed	6,254	86.2	25.9	
TUNTUTULIAK CDP	Distressed	Distressed	11,458	73.4	35.2	
TUNUNAK CDP	Distressed	Distressed	9,981	79.3	35.7	
UPPER KALSKAG CITY	Distressed	Distressed	10,477	75.5	31.3	
Bristol Bay Borough						
KING SALMON CDP	Non-Distressed	Non-Distressed	32,077	48.8	38.4	
NAKNEK CDP	Non-Distressed	Non-Distressed	30,456	55.9	39.2	
SOUTH NAKNEK CDP	Non-Distressed	Non-Distressed	25,530	68.8	17.2	Yes
Denali Borough						
ANDERSON CITY	Non-Distressed	Non-Distressed	18,923	68.6	31.4	Yes
CANTWELL CDP	Non-Distressed	Non-Distressed	18,355	65.5	31.6	
FERRY CDP	Distressed	Non-Distressed	10,708	76.7	16.7	
HEALY CDP	Non-Distressed	Non-Distressed	23,048	60.6	37.3	
MCKINLEY PARK CDP	Non-Distressed	Distressed	15,131	66.8	27.4	Yes
Dillingham Census Area						
ALEKNAGIK CITY	Distressed	Distressed	18,970	70.3	29.7	
CLARKS POINT CITY	Distressed	Distressed	10,431	88.9	33.3	
DILLINGHAM CITY	Non-Distressed	Non-Distressed	29,258	50.8	46.7	
EKWOK CITY	Distressed	Distressed	12,338	72.0	37.8	
KOLIGANEK CDP	Distressed	Non-Distressed	13,862	72.0	30.5	
MANOKOTAK CITY	Distressed	Distressed	10,486	82.8	23.2	
NEW STUYAHOK CITY	Distressed	Distressed	10,777	76.7	34.7	
PORTAGE CREEK CDP	Distressed	Distressed	ND	100.0	0.0	
TOGIAK CITY	Distressed	Distressed	13,226	79.3	25.6	
TWIN HILLS CDP	Distressed	Distressed	9,870	74.1	34.5	
Fairbanks North star Borough						
COLLEGE CDP	Non-Distressed	Non-Distressed	24,633	53.3	46.6	
EIELSON AFB	Distressed	Distressed	4,757	88.2	12.0	
ESTER CDP	Non-Distressed	Non-Distressed	24,875	52.3	46.2	
FAIRBANKS CITY	Non-Distressed	Non-Distressed	18,929	60.8	40.4	

Distressed Community Status 2009, Alaska Communities by Borough/Census Area and Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
FOX CDP	Non-Distressed	Non-Distressed	26,995	52.0	45.6	
HARDING-BIRCH LAKES CDP	Distressed	Non-Distressed	16,571	70.1	25.7	
MOOSE CREEK CDP	Non-Distressed	Non-Distressed	16,711	64.0	37.1	
NORTH POLE CITY	Non-Distressed	Non-Distressed	19,706	60.2	41.4	
PLEASANT VALLEY CDP	Non-Distressed	Non-Distressed	19,967	61.0	36.8	
SALCHA CDP	Non-Distressed	Non-Distressed	16,932	68.3	31.3	Yes
TWO RIVERS CDP	Non-Distressed	Non-Distressed	23,622	51.7	46.5	
Haines Borough						
COVENANT LIFE CDP	Distressed	Distressed	10,881	73.8	29.2	
EXCURSION INLET CDP	Distressed	Distressed	ND	76.9	15.4	
HAINES CDP	Non-Distressed	Non-Distressed	17,640	70.5	31.4	Yes
LUTAK CDP	Distressed	Distressed	12,377	66.7	25.0	
MOSQUITO LAKE CDP	Distressed	Distressed	11,708	76.1	24.4	
MUD BAY CDP	Distressed	Distressed	13,501	69.5	29.7	
Hoonah-Angoon Census Area						
ANGOON CITY	Distressed	Distressed	11,678	72.2	31.7	
ELFIN COVE CDP	Distressed	Distressed	38,219	87.9	24.2	
GAME CREEK CDP	Distressed	Distressed	ND	100.0	0.0	
GUSTAVUS CDP	Distressed	Distressed	11,866	82.2	19.0	
HOBART BAY CDP	Distressed	Distressed	ND	100.0	0.0	
HOONAH CITY	Non-Distressed	Distressed	16,366	72.0	31.2	Yes
KLUKWAN CDP	Distressed	Non-Distressed	12,394	71.1	38.9	
PELICAN CITY	Distressed	Distressed	25,854	77.6	22.4	
TENAKEE SPRINGS CITY	Distressed	Distressed	11,922	81.9	26.6	
WHITESTONE CAMP	Distressed	Non-Distressed	8,779	85.7	14.3	
Juneau Borough						
JUNEAU CITY	Non-Distressed	Non-Distressed	25,495	50.7	49.8	
Kenai Peninsula Borough						
ANCHOR POINT CDP	Non-Distressed	Non-Distressed	17,677	68.7	30.0	Yes
BEAR CREEK CDP	Non-Distressed	Non-Distressed	21,559	53.9	44.0	
BELUGA CDP	Distressed	Distressed	18,017	73.7	26.3	
CLAM GULCH CDP	Distressed	Distressed	21,990	71.8	25.8	
COHOE CDP	Non-Distressed	Non-Distressed	17,821	68.8	30.4	Yes
COOPER LANDING CDP	Distressed	Distressed	13,274	76.9	19.8	
CROWN POINT CDP	Distressed	Distressed	14,808	64.0	26.0	
DIAMOND RIDGE CDP	Non-Distressed	N/A	17,447	66.8	33.5	
FOX RIVER CDP	Distressed	Distressed	5,044	87.4	15.7	
FRITZ CREEK CDP	Non-Distressed	Distressed	16,422	68.7	31.8	Yes

Distressed Community Status 2009, Alaska Communities by Borough/Census Area and Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
FUNNY RIVER CDP	Distressed	Distressed	16,188	71.3	28.4	
HALIBUT COVE CDP	Distressed	Distressed	27,996	90.9	12.1	
HAPPY VALLEY CDP	Distressed	Distressed	13,150	75.9	22.3	
HOMER CITY	Non-Distressed	Non-Distressed	33,217	68.6	32.2	Yes
HOPE CDP	Distressed	Distressed	11,380	77.6	19.4	
KACHEMAK CITY	Non-Distressed	Non-Distressed	16,236	68.4	31.1	Yes
KALIFORNSKY CDP	Non-Distressed	Non-Distressed	26,574	57.8	43.3	
KASILOF CDP	Non-Distressed	Non-Distressed	27,574	66.3	34.6	
KENAI CITY	Non-Distressed	Non-Distressed	24,894	58.5	43.3	
LOWELL POINT CDP	Non-Distressed	Non-Distressed	26,340	56.1	46.3	
MOOSE PASS CDP	Non-Distressed	Distressed	18,159	66.5	30.5	
NANWALEK CDP	Distressed	Distressed	10,163	76.1	32.1	
NIKISKI CDP	Non-Distressed	Non-Distressed	23,878	62.1	39.0	
NIKOLAEVSK CDP	Distressed	Distressed	20,578	79.0	21.9	
NINILCHIK CDP	Distressed	Distressed	16,037	73.6	24.1	
PORT GRAHAM CDP	Distressed	Distressed	12,370	70.5	34.8	
PRIMROSE CDP	Non-Distressed	Non-Distressed	21,529	64.0	33.3	
RIDGEWAY CDP	Non-Distressed	Non-Distressed	22,022	61.9	38.5	
SALAMATOF CDP	Non-Distressed	Non-Distressed	21,181	64.5	35.9	
SELDOVIA CITY	Distressed	Distressed	25,153	76.9	27.5	
SELDOVIA VILLAGE CDP	Non-Distressed	Non-Distressed	13,297	69.1	33.1	Yes
SEWARD CITY	Non-Distressed	Non-Distressed	25,657	57.0	42.1	
SOLDOTNA CITY	Non-Distressed	Non-Distressed	24,776	59.7	42.7	
STERLING CDP	Non-Distressed	Non-Distressed	23,807	60.9	39.5	
SUNRISE CDP	Non-Distressed	Non-Distressed	15,554	56.3	31.3	
TYONEK CDP	Non-Distressed	Distressed	13,438	65.8	33.3	
Ketchikan Gateway Borough						
KETCHIKAN CITY	Non-Distressed	Non-Distressed	22,973	56.2	45.0	
SAXMAN CITY	Non-Distressed	Non-Distressed	15,142	66.9	37.0	
Kodiak Island Borough						
AKHIOK CITY	Distressed	Distressed	12,688	72.5	52.5	
ALENEVA CDP	Distressed	Distressed	10,330	83.3	16.7	
CHINIAK CDP	Distressed	Non-Distressed	13,197	71.7	23.3	
KARLUK CDP	Distressed	Distressed	12,212	73.9	43.5	
KODIAK CITY	Non-Distressed	Non-Distressed	42,358	55.6	51.4	
KODIAK STATION CDP	Distressed	Distressed	6,960	85.3	17.7	
LARSEN BAY CITY	Non-Distressed	Non-Distressed	17,675	70.2	31.6	Yes
OLD HARBOR CITY	Distressed	Distressed	18,844	82.9	28.3	
OUZINKIE CITY	Distressed	Non-Distressed	14,719	74.1	40.1	
PORT LIONS CITY	Non-Distressed	Distressed	18,225	72.3	32.7	Yes

Distressed Community Status 2009, Alaska Communities by Borough/Census Area and Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
WOMENS BAY CDP	Non-Distressed	Non-Distressed	20,184	63.5	35.7	
Lake and Peninsula Borough						
CHIGNIK CITY	Non-Distressed	Non-Distressed	50,220	44.9	51.0	
CHIGNIK LAGOON	Distressed	Distressed	80,571	79.4	25.4	
CHIGNIK LAKE	Distressed	Non-Distressed	9,977	82.2	28.8	
EGEGIK CITY	Non-Distressed	Non-Distressed	26,726	64.0	34.0	
IGIUGIG CITY	Non-Distressed	Non-Distressed	19,254	58.6	55.2	
ILIAMNA CITY	Non-Distressed	Non-Distressed	26,022	51.1	42.9	
KOKHANOK CDP	Distressed	Distressed	11,167	78.4	30.4	
LEVELOCK CDP	Non-Distressed	Non-Distressed	18,100	69.2	32.7	Yes
NEWHALEN CITY	Non-Distressed	Non-Distressed	29,267	47.5	45.9	
NONDALTON CITY	Distressed	Distressed	11,836	76.5	29.5	
PEDRO BAY CDP	Non-Distressed	Non-Distressed	19,090	62.5	37.5	
PERRYVILLE CDP	Distressed	Distressed	15,266	77.1	29.2	
PILOT POINT CITY	Non-Distressed	Non-Distressed	22,041	69.6	47.8	
POPE-VANNOY LANDING CDP	Distressed	Distressed	ND	100.0	0.0	
PORT ALSWORTH CDP	Distressed	Distressed	10,014	82.4	22.4	
PORT HEIDEN CITY	Non-Distressed	Non-Distressed	31,410	53.0	40.9	
UGASHIK CDP	Distressed	Distressed	35,151	75.0	16.7	
Matanuska-Susitna Borough						
BIG LAKE CDP	Non-Distressed	Non-Distressed	19,451	65.2	35.0	
BUFFALO SOAPSTONE CDP	Non-Distressed	Non-Distressed	21,950	57.0	41.6	
BUTTE CDP	Non-Distressed	Non-Distressed	22,156	60.0	40.3	
CHASE CDP	Distressed	Distressed	19,813	72.3	27.7	
CHICKALOON CDP	Non-Distressed	Non-Distressed	18,802	65.7	32.9	
FARM LOOP CDP	Non-Distressed	Non-Distressed	21,527	62.3	39.4	
FISHHOOK CDP	Non-Distressed	Non-Distressed	24,566	57.7	42.7	
GATEWAY CDP	Non-Distressed	Non-Distressed	25,339	57.1	43.0	
GLACIER VIEW CDP	Distressed	Distressed	15,934	71.2	23.7	
HOUSTON CITY	Non-Distressed	Non-Distressed	17,539	63.9	36.4	
KNIK RIVER CDP	Non-Distressed	Non-Distressed	22,980	59.1	39.7	
KNIK-FAIRVIEW CDP	Non-Distressed	Non-Distressed	24,329	56.4	43.3	
LAKE LOUISE CDP	Distressed	Distressed	12,629	83.3	16.7	
LAKES CDP	Non-Distressed	Non-Distressed	24,670	58.3	42.6	
LAZY MOUNTAIN CDP	Non-Distressed	Non-Distressed	20,643	63.5	36.3	
MEADOW LAKES CDP	Non-Distressed	Non-Distressed	20,534	61.8	38.0	
PALMER CITY	Non-Distressed	Non-Distressed	19,863	61.8	40.2	
PETERSVILLE CDP	Non-Distressed	Non-Distressed	29,527	66.7	33.3	
POINT MACKENZIE CDP	Non-Distressed	Distressed	16,721	69.9	30.8	Yes

Distressed Community Status 2009, Alaska Communities by Borough/Census Area and Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
SKWENTNA CDP	Distressed	Distressed	5,032	88.6	7.1	
SUSITNA CDP	Distressed	Distressed	10,582	80.8	11.5	
SUTTON-ALPINE CDP	Non-Distressed	Non-Distressed	17,872	64.2	33.2	
TALKEETNA CDP	Non-Distressed	Distressed	16,717	66.5	34.3	
TANAINA CDP	Non-Distressed	Non-Distressed	23,923	56.2	44.2	
TRAPPER CREEK CDP	Distressed	Distressed	12,176	76.5	23.7	
WASILLA CITY	Non-Distressed	Non-Distressed	22,153	61.0	39.2	
WILLOW CDP	Non-Distressed	Distressed	17,539	69.4	29.3	Yes
Y CDP	Distressed	Distressed	12,583	75.5	25.6	
Nome Census Area						
BREVIG MISSION CITY	Distressed	Distressed	9,672	76.1	38.5	
DIOMEDE CITY	Non-Distressed	Non-Distressed	14,117	63.9	51.4	
ELIM CITY	Distressed	Distressed	11,293	71.9	36.2	
GAMBELL CITY	Distressed	Distressed	8,954	77.9	31.7	
GOLOVIN CITY	Non-Distressed	Non-Distressed	17,194	55.6	60.6	
KOYUK CITY	Distressed	Distressed	11,414	75.3	38.9	
NOME CITY	Non-Distressed	Non-Distressed	28,859	49.1	49.7	
SAINT MICHAEL CITY	Non-Distressed	Non-Distressed	13,528	69.7	32.8	Yes
SAVOONGA CITY	Distressed	Distressed	9,942	78.9	25.9	
SHAKTOOLIK CITY	Non-Distressed	Non-Distressed	15,659	65.1	44.1	
SHISHMAREF CITY	Distressed	Distressed	9,466	78.6	36.5	
STEBBINS CITY	Distressed	Distressed	8,198	80.0	30.1	
TELLER CITY	Distressed	Distressed	11,405	72.2	38.1	
UNALAKLEET CITY	Non-Distressed	Non-Distressed	18,593	64.7	37.2	
WALES CITY	Non-Distressed	Distressed	12,225	69.1	46.8	Yes
WHITE MOUNTAIN CITY	Non-Distressed	Non-Distressed	13,572	66.9	43.1	
North Slope Borough						
ANAKTUVUK PASS CITY	Non-Distressed	Non-Distressed	16,441	63.1	33.3	
ATQASUK CITY	Non-Distressed	Non-Distressed	16,637	61.7	34.4	
BARROW CITY	Non-Distressed	Non-Distressed	29,072	47.8	41.8	
KAKTOVIK CITY	Non-Distressed	Non-Distressed	21,552	53.4	45.5	
NUIQSUT CITY	Non-Distressed	Non-Distressed	18,796	57.6	34.6	
POINT HOPE CITY	Non-Distressed	Distressed	14,582	63.0	30.9	Yes
POINT LAY CDP	Non-Distressed	Non-Distressed	17,115	55.7	32.9	
PRUDHOE BAY	Non-Distressed	Non-Distressed	67,434	13.6	81.8	
WAINWRIGHT CITY	Non-Distressed	Non-Distressed	16,683	61.4	28.3	
Northwest Arctic Borough						
AMBLER CITY	Distressed	Non-Distressed	12,909	72.5	27.5	
BUCKLAND CITY	Non-Distressed	Non-Distressed	14,769	67.2	32.1	Yes
DEERING CITY	Non-Distressed	Non-Distressed	16,491	60.9	43.5	

Distressed Community Status 2009, Alaska Communities by Borough/Census Area and Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
KIANA CITY	Non-Distressed	Non-Distressed	15,056	71.7	33.1	Yes
KIVALINA CITY	Distressed	Distressed	12,131	75.4	32.9	
KOBUK CITY	Non-Distressed	Non-Distressed	15,458	68.4	28.9	Yes
KOTZEBUE CITY	Non-Distressed	Non-Distressed	27,127	52.0	46.7	
NOATAK CDP	Non-Distressed	Non-Distressed	16,047	69.5	47.4	
NOORVIK CITY	Distressed	Distressed	13,930	71.9	28.8	
RED DOG MINE CDP	Non-Distressed	Non-Distressed	ND	0.0	100.0	
SELAWIK CITY	Distressed	Distressed	10,795	74.6	24.1	
SHUNGNAK CITY	Non-Distressed	Distressed	14,073	67.7	30.5	Yes
Petersburg Census Area						
KAKE CITY	Distressed	Distressed	14,190	71.2	36.2	
KUPREANOF CITY	Distressed	Distressed	8,198	75.0	25.0	
PETERSBURG CITY	Non-Distressed	Non-Distressed	35,319	69.6	33.1	
PORT ALEXANDER	Distressed	Distressed	33,538	90.2	12.2	
Prince of Wales-Outer Ketchikan/Hyder Census Area						
COFFMAN COVE CITY	Non-Distressed	Distressed	17,621	65.2	32.6	
CRAIG CITY	Non-Distressed	Non-Distressed	23,289	65.0	38.1	
EDNA BAY	Distressed	Distressed	20,202	82.4	11.8	
HOLLIS CDP	Distressed	Distressed	13,883	71.7	31.5	
HYDABURG CITY	Distressed	Distressed	16,977	72.5	24.8	
HYDER CDP	Distressed	Distressed	5,692	89.6	11.7	
KASAAN CITY	Non-Distressed	Distressed	14,516	66.7	35.9	
KLAWOCK CITY	Non-Distressed	Non-Distressed	16,570	66.8	36.0	
METLAKATLA	Non-Distressed	Non-Distressed	16,528	63.7	38.0	
NAUKATI BAY CDP	Distressed	Distressed	8,366	84.6	18.8	
POINT BAKER CDP	Distressed	Distressed	ND	91.3	13.0	
PORT PROTECTION CDP	Distressed	Distressed	3,037	92.6	14.8	
THORNE BAY CITY	Distressed	Distressed	12,986	75.3	25.8	
WHALE PASS CDP	Distressed	Distressed	3,088	90.5	9.5	
Sitka Borough						
SITKA CITY	Non-Distressed	Non-Distressed	24,706	58.7	43.3	
Skagway Municipality						
SKAGWAY CITY	Non-Distressed	Non-Distressed	18,753	59.6	34.0	
Southeast Fairbanks Census Area						
ALCAN BORDER CDP	Distressed	Distressed	ND	100.0	0.0	
BIG DELTA CDP	Distressed	Distressed	16,107	70.5	28.6	
CHICKEN CDP	Distressed	Distressed	ND	93.8	6.3	
DELTA JUNCTION CITY	Non-Distressed	Non-Distressed	21,322	64.8	35.3	
DELTANA CDP	Non-Distressed	Non-Distressed	17,868	64.9	33.0	
DOT LAKE CDP	Distressed	Distressed	6,434	76.2	23.8	

Distressed Community Status 2009, Alaska Communities by Borough/Census Area and Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
DOT LAKE VILLAGE	Non-Distressed	Distressed	11,888	69.2	30.8	Yes
DRY CREEK CDP	Distressed	Distressed	2,280	93.3	5.0	
EAGLE CITY	Distressed	Distressed	8,532	79.0	23.5	
EAGLE VILLAGE	Distressed	Distressed	6,871	86.6	17.9	
FORT GREELY CDP	Distressed	Distressed	13,206	79.2	17.5	
HEALY LAKE CDP	Distressed	Non-Distressed	5,296	81.8	27.3	
NORTHWAY CDP	Distressed	Distressed	10,830	74.7	26.5	
NORTHWAY JUNCTION CDP	Non-Distressed	Distressed	20,466	63.4	41.5	
NORTHWAY VILLAGE	Distressed	Distressed	11,333	77.6	24.1	
TANACROSS CDP	Distressed	Distressed	11,405	73.6	23.1	
TETLIN CDP	Distressed	Distressed	6,986	84.6	20.5	
TOK CDP	Non-Distressed	Distressed	16,574	66.5	33.1	
Valdez-Cordova Census Area						
CHENEGA CDP	Non-Distressed	Non-Distressed	20,544	46.9	44.9	
CHISANA	Distressed	Distressed	ND	100.0	0.0	
CHISTOCHINA CDP	Non-Distressed	Non-Distressed	17,326	67.1	34.2	
CHITINA CDP	Distressed	Distressed	9,344	81.9	27.7	
COPPER CENTER CDP	Non-Distressed	Non-Distressed	18,208	68.4	33.7	
COPPERVILLE CDP	Non-Distressed	Non-Distressed	22,216	59.6	42.6	
CORDOVA CITY	Non-Distressed	Non-Distressed	37,062	62.3	36.0	
GAKONA CDP	Non-Distressed	Non-Distressed	18,410	62.8	36.1	
GLENNALLEN CDP	Non-Distressed	Non-Distressed	17,538	67.8	36.5	
GULKANA CDP	Distressed	Distressed	12,411	70.4	33.8	
KENNY LAKE CDP	Distressed	Distressed	12,418	75.1	25.9	
MCCARTHY CDP	Distressed	Distressed	7,392	82.4	10.3	
MENDELTNA CDP	Non-Distressed	Non-Distressed	19,756	64.4	37.3	
MENTASTA LAKE CDP	Distressed	Distressed	12,105	76.1	19.6	
NELCHINA CDP	Distressed	Distressed	16,341	71.2	25.4	
PAXSON CDP	Distressed	Distressed	16,385	80.0	15.0	
SILVER SPRINGS CDP	Non-Distressed	Non-Distressed	17,820	63.5	32.2	
SLANA CDP	Distressed	Distressed	7,777	77.1	14.7	
TATITLEK CDP	Distressed	Non-Distressed	14,513	77.8	30.6	
TAZLINA CDP	Non-Distressed	Non-Distressed	20,896	62.5	37.5	
TOLSONA CDP	Distressed	Distressed	11,188	72.4	24.1	
TONSINA CDP	Distressed	Distressed	11,312	76.2	20.6	
VALDEZ CITY	Non-Distressed	Non-Distressed	37,124	49.4	51.4	
WHITTIER CITY	Non-Distressed	Distressed	16,759	67.4	29.3	Yes
WILLOW CREEK CDP	Distressed	Distressed	9,720	77.6	23.1	
Wade Hampton Census Area						

Distressed Community Status 2009, Alaska Communities by Borough/Census Area and Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
ALAKANUK CITY	Distressed	Distressed	8,919	80.6	27.4	
CHEVAK CITY	Distressed	Distressed	8,948	78.7	33.3	
EMMONAK CITY	Distressed	Distressed	12,814	71.1	35.4	
HOOPER BAY CITY	Distressed	Distressed	8,465	79.5	30.2	
KOTLIK CITY	Distressed	Distressed	9,486	79.5	32.6	
MARSHALL CITY	Distressed	Distressed	12,078	72.0	39.4	
MOUNTAIN VILLAGE CITY	Distressed	Distressed	12,415	73.0	36.7	
NUNAM IQUA CITY	Distressed	Distressed	11,310	73.3	54.3	
PILOT STATION CITY	Distressed	Distressed	8,726	80.7	30.2	
PITKAS POINT CDP	Distressed	Distressed	8,229	81.1	32.1	
RUSSIAN MISSION CITY	Distressed	Distressed	10,357	74.9	37.0	
SAINT MARYS CITY	Non-Distressed	Distressed	14,656	66.4	37.4	
SCAMMON BAY CITY	Distressed	Distressed	8,506	80.8	30.6	
Wrangell Borough						
MEYERS CHUCK	Distressed	N/A	ND	100.0	5.3	
THOMS PLACE	Distressed	Distressed	ND	62.5	25.0	
WRANGELL CITY	Non-Distressed	Non-Distressed	20,648	68.1	31.8	Yes
Yakutat Borough						
YAKUTAT	Non-Distressed	Non-Distressed	21,288	65.8	38.0	
Yukon-Koyukuk Census Area						
ALATNA CDP	Distressed	Distressed	8,374	88.2	11.8	
ALLAKAKET ANVSA	Distressed	Distressed	8,554	80.8	27.2	
ANVIK CITY	Distressed	Distressed	13,177	73.2	44.6	
ARCTIC VILLAGE CDP	Distressed	Distressed	9,874	78.4	26.7	
BEAVER CDP	Non-Distressed	Distressed	11,809	67.8	37.3	Yes
BETTLES CITY	Distressed	Distressed	10,781	81.0	28.6	
BIRCH CREEK CDP	Distressed	Distressed	2,059	94.1	0.0	
CENTRAL CDP	Distressed	Distressed	10,536	83.8	20.0	
CHALKYITSIK CDP	Distressed	Distressed	11,012	71.2	39.0	
CIRCLE CDP	Distressed	Distressed	4,813	92.3	12.8	
COLDFOOT CDP	Non-Distressed	Non-Distressed	21,002	57.9	42.1	
EVANSVILLE CDP	Non-Distressed	Non-Distressed	31,679	40.0	60.0	
FORT YUKON CITY	Non-Distressed	Non-Distressed	13,712	68.2	33.0	Yes
FOUR MILE ROAD CDP	Non-Distressed	Non-Distressed	31,644	53.3	53.3	
GALENA CITY	Non-Distressed	Non-Distressed	22,236	54.5	37.9	
GRAYLING CITY	Distressed	Distressed	7,100	82.7	27.3	
HOLY CROSS CITY	Distressed	Distressed	7,197	81.1	28.7	
HUGHES CITY	Non-Distressed	Distressed	12,101	65.6	49.2	
HUSLIA CITY	Distressed	Distressed	9,150	76.6	22.3	

Distressed Community Status 2009, Alaska Communities by Borough/Census Area and Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
KALTAG CITY	Distressed	Distressed	9,308	78.7	24.7	
KOYUKUK CITY	Distressed	Distressed	8,867	78.8	37.9	
LAKE MINCHUMINA CDP	Distressed	Distressed	ND	73.3	20.0	
LIVENGOOD CDP	Distressed	Distressed	10,664	81.0	16.7	
MANLEY HOT SPRINGS CDP	Distressed	Distressed	14,240	74.4	28.2	
MCGRATH CITY	Non-Distressed	Non-Distressed	18,725	61.3	34.7	
MINTO CDP	Distressed	Distressed	9,398	79.7	27.5	
NENANA CITY	Non-Distressed	Non-Distressed	16,389	68.1	27.7	Yes
NIKOLAI CITY	Distressed	Distressed	6,674	86.1	13.9	
NULATO CITY	Distressed	Distressed	10,838	72.8	33.2	
RAMPART CDP	Distressed	Distressed	9,945	78.9	47.4	
RUBY CITY	Distressed	Distressed	14,524	70.7	36.8	
SHAGELUK CITY	Distressed	Distressed	7,903	82.1	23.9	
STEVENS VILLAGE CDP	Distressed	Distressed	7,016	85.7	25.0	
TAKOTNA CDP	Non-Distressed	Distressed	20,634	54.5	54.5	
TANANA CITY	Non-Distressed	Non-Distressed	14,408	63.2	34.8	
VENETIE CDP	Distressed	Distressed	6,923	84.9	21.6	
WISEMAN CDP	Distressed	Non-Distressed	18,332	76.9	23.1	

Cells marked with ND were not able to be disclosed due to confidentiality policies.
Source: Alaska Department of Labor, Research and Analysis Section; Commercial Fisheries Entry Commission

Distressed Community Status 2009, Alaska Communities by Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
ADAK CITY	Non-Distressed	Non-Distressed	22,785	60.7	26.8	
AKHIOK CITY	Distressed	Distressed	12,688	72.5	52.5	
AKIACHAK CDP	Distressed	Non-Distressed	11,477	75.1	27.8	
AKIAK CITY	Distressed	Non-Distressed	10,885	70.4	44.2	
AKUTAN CITY	Non-Distressed	Non-Distressed	28,396	41.9	72.0	
ALAKANUK CITY	Distressed	Distressed	8,919	80.6	27.4	
ALATNA CDP	Distressed	Distressed	8,374	88.2	11.8	
ALCAN BORDER CDP	Distressed	Distressed	ND	100.0	0.0	
ALEKNAGIK CITY	Distressed	Distressed	18,970	70.3	29.7	
ALENEVA CDP	Distressed	Distressed	10,330	83.3	16.7	
ALLAKAKET ANVSA	Distressed	Distressed	8,554	80.8	27.2	
AMBLER CITY	Distressed	Non-Distressed	12,909	72.5	27.5	
ANAKTUVUK PASS CITY	Non-Distressed	Non-Distressed	16,441	63.1	33.3	
ANCHOR POINT CDP	Non-Distressed	Non-Distressed	17,677	68.7	30.0	Yes
ANCHORAGE	Non-Distressed	Non-Distressed	25,814	53.7	46.9	
ANDERSON CITY	Non-Distressed	Non-Distressed	18,923	68.6	31.4	Yes
ANGOON CITY	Distressed	Distressed	11,678	72.2	31.7	
ANIAK CITY	Non-Distressed	Non-Distressed	19,790	57.8	42.2	
ANVIK CITY	Distressed	Distressed	13,177	73.2	44.6	
ARCTIC VILLAGE CDP	Distressed	Distressed	9,874	78.4	26.7	
ATKA CITY	Non-Distressed	Non-Distressed	25,377	46.9	63.3	
ATMAUTLUAK CDP	Distressed	Distressed	7,875	80.9	23.0	
ATQASUK CITY	Non-Distressed	Non-Distressed	16,637	61.7	34.4	
BARROW CITY	Non-Distressed	Non-Distressed	29,072	47.8	41.8	
BEAR CREEK CDP	Non-Distressed	Non-Distressed	21,559	53.9	44.0	
BEAVER CDP	Non-Distressed	Distressed	11,809	67.8	37.3	Yes
BELUGA CDP	Distressed	Distressed	18,017	73.7	26.3	
BETHEL CITY	Non-Distressed	Non-Distressed	28,323	47.8	49.0	
BETTLES CITY	Distressed	Distressed	10,781	81.0	28.6	
BIG DELTA CDP	Distressed	Distressed	16,107	70.5	28.6	
BIG LAKE CDP	Non-Distressed	Non-Distressed	19,451	65.2	35.0	
BIRCH CREEK CDP	Distressed	Distressed	2,059	94.1	0.0	
BREVIG MISSION CITY	Distressed	Distressed	9,672	76.1	38.5	
BUCKLAND CITY	Non-Distressed	Non-Distressed	14,769	67.2	32.1	Yes
BUFFALO SOAPSTONE	Non-Distressed	Non-Distressed	21,950	57.0	41.6	
BUTTE CDP	Non-Distressed	Non-Distressed	22,156	60.0	40.3	
CANTWELL CDP	Non-Distressed	Non-Distressed	18,355	65.5	31.6	
CENTRAL CDP	Distressed	Distressed	10,536	83.8	20.0	
CHALKYITSIK CDP	Distressed	Distressed	11,012	71.2	39.0	
CHASE CDP	Distressed	Distressed	19,813	72.3	27.7	

Distressed Community Status 2009, Alaska Communities by Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
CHEFORNAK CITY	Distressed	Distressed	11,206	78.0	45.5	
CHENEGA CDP	Non-Distressed	Non-Distressed	20,544	46.9	44.9	
CHEVAK CITY	Distressed	Distressed	8,948	78.7	33.3	
CHICKALOON CDP	Non-Distressed	Non-Distressed	18,802	65.7	32.9	
CHICKEN CDP	Distressed	Distressed	ND	93.8	6.3	
CHIGNIK CITY	Non-Distressed	Non-Distressed	50,220	44.9	51.0	
CHIGNIK LAGOON	Distressed	Distressed	80,571	79.4	25.4	
CHIGNIK LAKE	Distressed	Non-Distressed	9,977	82.2	28.8	
CHINIAK CDP	Distressed	Non-Distressed	13,197	71.7	23.3	
CHISANA	Distressed	Distressed	ND	100.0	0.0	
CHISTOCHINA CDP	Non-Distressed	Non-Distressed	17,326	67.1	34.2	
CHITINA CDP	Distressed	Distressed	9,344	81.9	27.7	
CHUATHBALUK CITY	Distressed	Distressed	10,981	76.7	35.0	
CIRCLE CDP	Distressed	Distressed	4,813	92.3	12.8	
CLAM GULCH CDP	Distressed	Distressed	21,990	71.8	25.8	
CLARKS POINT CITY	Distressed	Distressed	10,431	88.9	33.3	
COFFMAN COVE CITY	Non-Distressed	Distressed	17,621	65.2	32.6	
COHOE CDP	Non-Distressed	Non-Distressed	17,821	68.8	30.4	Yes
COLD BAY CITY	Non-Distressed	Non-Distressed	29,035	46.3	50.0	
COLDFOOT CDP	Non-Distressed	Non-Distressed	21,002	57.9	42.1	
COLLEGE CDP	Non-Distressed	Non-Distressed	24,633	53.3	46.6	
COOPER LANDING CDP	Distressed	Distressed	13,274	76.9	19.8	
COPPER CENTER CDP	Non-Distressed	Non-Distressed	18,208	68.4	33.7	
COPPERVILLE CDP	Non-Distressed	Non-Distressed	22,216	59.6	42.6	
CORDOVA CITY	Non-Distressed	Non-Distressed	37,062	62.3	36.0	
COVENANT LIFE CDP	Distressed	Distressed	10,881	73.8	29.2	
CRAIG CITY	Non-Distressed	Non-Distressed	23,289	65.0	38.1	
CROOKED CREEK CDP	Distressed	Distressed	9,767	76.7	34.9	
CROWN POINT CDP	Distressed	Distressed	14,808	64.0	26.0	
DEERING CITY	Non-Distressed	Non-Distressed	16,491	60.9	43.5	
DELTA JUNCTION CITY	Non-Distressed	Non-Distressed	21,322	64.8	35.3	
DELTANA CDP	Non-Distressed	Non-Distressed	17,868	64.9	33.0	
DIAMOND RIDGE CDP	Non-Distressed	N/A	17,447	66.8	33.5	
DILLINGHAM CITY	Non-Distressed	Non-Distressed	29,258	50.8	46.7	
DIOMEDE CITY	Non-Distressed	Non-Distressed	14,117	63.9	51.4	
DOT LAKE CDP	Distressed	Distressed	6,434	76.2	23.8	
DOT LAKE VILLAGE	Non-Distressed	Distressed	11,888	69.2	30.8	Yes
DRY CREEK CDP	Distressed	Distressed	2,280	93.3	5.0	
EAGLE CITY	Distressed	Distressed	8,532	79.0	23.5	
EAGLE VILLAGE	Distressed	Distressed	6,871	86.6	17.9	
EDNA BAY	Distressed	Distressed	20,202	82.4	11.8	

Distressed Community Status 2009, Alaska Communities by Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
EEK CITY	Distressed	Distressed	10,585	76.6	37.8	
EGEGIK CITY	Non-Distressed	Non-Distressed	26,726	64.0	34.0	
EIELSON AFB	Distressed	Distressed	4,757	88.2	12.0	
EKWOK CITY	Distressed	Distressed	12,338	72.0	37.8	
ELFIN COVE CDP	Distressed	Distressed	38,219	87.9	24.2	
ELIM CITY	Distressed	Distressed	11,293	71.9	36.2	
EMMONAK CITY	Distressed	Distressed	12,814	71.1	35.4	
ESTER CDP	Non-Distressed	Non-Distressed	24,875	52.3	46.2	
EVANSVILLE CDP	Non-Distressed	Non-Distressed	31,679	40.0	60.0	
EXCURSION INLET CDP	Distressed	Distressed	ND	76.9	15.4	
FAIRBANKS CITY	Non-Distressed	Non-Distressed	18,929	60.8	40.4	
FALSE PASS CITY	Non-Distressed	Non-Distressed	57,770	57.7	50.0	
FARM LOOP CDP	Non-Distressed	Non-Distressed	21,527	62.3	39.4	
FERRY CDP	Distressed	Non-Distressed	10,708	76.7	16.7	
FISHHOOK CDP	Non-Distressed	Non-Distressed	24,566	57.7	42.7	
FORT GREELY CDP	Distressed	Distressed	13,206	79.2	17.5	
FORT YUKON CITY	Non-Distressed	Non-Distressed	13,712	68.2	33.0	Yes
FOUR MILE ROAD CDP	Non-Distressed	Non-Distressed	31,644	53.3	53.3	
FOX CDP	Non-Distressed	Non-Distressed	26,995	52.0	45.6	
FOX RIVER CDP	Distressed	Distressed	5,044	87.4	15.7	
FRITZ CREEK CDP	Non-Distressed	Distressed	16,422	68.7	31.8	Yes
FUNNY RIVER CDP	Distressed	Distressed	16,188	71.3	28.4	
GAKONA CDP	Non-Distressed	Non-Distressed	18,410	62.8	36.1	
GALENA CITY	Non-Distressed	Non-Distressed	22,236	54.5	37.9	
GAMBELL CITY	Distressed	Distressed	8,954	77.9	31.7	
GAME CREEK CDP	Distressed	Distressed	ND	100.0	0.0	
GATEWAY CDP	Non-Distressed	Non-Distressed	25,339	57.1	43.0	
GLACIER VIEW CDP	Distressed	Distressed	15,934	71.2	23.7	
GLENNALLEN CDP	Non-Distressed	Non-Distressed	17,538	67.8	36.5	
GOLOVIN CITY	Non-Distressed	Non-Distressed	17,194	55.6	60.6	
GOODNEWS BAY CITY	Distressed	Distressed	12,293	76.4	29.7	
GRAYLING CITY	Distressed	Distressed	7,100	82.7	27.3	
GULKANA CDP	Distressed	Distressed	12,411	70.4	33.8	
GUSTAVUS CDP	Distressed	Distressed	11,866	82.2	19.0	
HAINES CDP	Non-Distressed	Non-Distressed	17,640	70.5	31.4	Yes
HALIBUT COVE CDP	Distressed	Distressed	27,996	90.9	12.1	
HAPPY VALLEY CDP	Distressed	Distressed	13,150	75.9	22.3	
HARDING-BIRCH LAKES CDP	Distressed	Non-Distressed	16,571	70.1	25.7	
HEALY CDP	Non-Distressed	Non-Distressed	23,048	60.6	37.3	
HEALY LAKE CDP	Distressed	Non-Distressed	5,296	81.8	27.3	

Distressed Community Status 2009, Alaska Communities by Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
HOBART BAY CDP	Distressed	Distressed	ND	100.0	0.0	
HOLLIS CDP	Distressed	Distressed	13,883	71.7	31.5	
HOLY CROSS CITY	Distressed	Distressed	7,197	81.1	28.7	
HOMER CITY	Non-Distressed	Non-Distressed	33,217	68.6	32.2	Yes
HOONAH CITY	Non-Distressed	Distressed	16,366	72.0	31.2	Yes
HOOPER BAY CITY	Distressed	Distressed	8,465	79.5	30.2	
HOPE CDP	Distressed	Distressed	11,380	77.6	19.4	
HOUSTON CITY	Non-Distressed	Non-Distressed	17,539	63.9	36.4	
HUGHES CITY	Non-Distressed	Distressed	12,101	65.6	49.2	
HUSLIA CITY	Distressed	Distressed	9,150	76.6	22.3	
HYDABURG CITY	Distressed	Distressed	16,977	72.5	24.8	
HYDER CDP	Distressed	Distressed	5,692	89.6	11.7	
IGIUGIG CITY	Non-Distressed	Non-Distressed	19,254	58.6	55.2	
ILIAMNA CITY	Non-Distressed	Non-Distressed	26,022	51.1	42.9	
JUNEAU CITY	Non-Distressed	Non-Distressed	25,495	50.7	49.8	
KACHEMAK CITY	Non-Distressed	Non-Distressed	16,236	68.4	31.1	Yes
KAKE CITY	Distressed	Distressed	14,190	71.2	36.2	
KAKTOVIK CITY	Non-Distressed	Non-Distressed	21,552	53.4	45.5	
KALIFORNSKY CDP	Non-Distressed	Non-Distressed	26,574	57.8	43.3	
KALTAG CITY	Distressed	Distressed	9,308	78.7	24.7	
KARLUK CDP	Distressed	Distressed	12,212	73.9	43.5	
KASAAN CITY	Non-Distressed	Distressed	14,516	66.7	35.9	
KASIGLUK CDP	Distressed	Distressed	9,131	80.0	36.5	
KASILOF CDP	Non-Distressed	Non-Distressed	27,574	66.3	34.6	
KENAI CITY	Non-Distressed	Non-Distressed	24,894	58.5	43.3	
KENNY LAKE CDP	Distressed	Distressed	12,418	75.1	25.9	
KETCHIKAN CITY	Non-Distressed	Non-Distressed	22,973	56.2	45.0	
KIANA CITY	Non-Distressed	Non-Distressed	15,056	71.7	33.1	Yes
KING COVE CITY	Non-Distressed	Non-Distressed	41,778	63.5	36.2	
KING SALMON CDP	Non-Distressed	Non-Distressed	32,077	48.8	38.4	
KIPNUK CDP	Distressed	Distressed	9,404	79.5	31.0	
KIVALINA CITY	Distressed	Distressed	12,131	75.4	32.9	
KLAWOCK CITY	Non-Distressed	Non-Distressed	16,570	66.8	36.0	
KLUKWAN CDP	Distressed	Non-Distressed	12,394	71.1	38.9	
KNIK RIVER CDP	Non-Distressed	Non-Distressed	22,980	59.1	39.7	
KNIK-FAIRVIEW CDP	Non-Distressed	Non-Distressed	24,329	56.4	43.3	
KOBUK CITY	Non-Distressed	Non-Distressed	15,458	68.4	28.9	Yes
KODIAK CITY	Non-Distressed	Non-Distressed	42,358	55.6	51.4	
KODIAK STATION CDP	Distressed	Distressed	6,960	85.3	17.7	
KOKHANOK CDP	Distressed	Distressed	11,167	78.4	30.4	
KOLIGANEK CDP	Distressed	Non-Distressed	13,862	72.0	30.5	

Distressed Community Status 2009, Alaska Communities by Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
KONGIGANAK CDP	Distressed	Distressed	8,975	81.0	35.4	
KOTLIK CITY	Distressed	Distressed	9,486	79.5	32.6	
KOTZEBUE CITY	Non-Distressed	Non-Distressed	27,127	52.0	46.7	
KOYUK CITY	Distressed	Distressed	11,414	75.3	38.9	
KOYUKUK CITY	Distressed	Distressed	8,867	78.8	37.9	
KUPREANOF CITY	Distressed	Distressed	8,198	75.0	25.0	
KWETHLUK CITY	Distressed	Distressed	9,523	76.0	30.1	
KWIGILLINGOK CDP	Distressed	Distressed	11,249	71.8	38.7	
LAKE LOUISE CDP	Distressed	Distressed	12,629	83.3	16.7	
LAKE MINCHUMINA CDP	Distressed	Distressed	ND	73.3	20.0	
LAKES CDP	Non-Distressed	Non-Distressed	24,670	58.3	42.6	
LARSEN BAY CITY	Non-Distressed	Non-Distressed	17,675	70.2	31.6	Yes
LAZY MOUNTAIN CDP	Non-Distressed	Non-Distressed	20,643	63.5	36.3	
LEVELOCK CDP	Non-Distressed	Non-Distressed	18,100	69.2	32.7	Yes
LIME VILLAGE CDP	Non-Distressed	Distressed	11,676	64.3	35.7	
LIVENGOOD CDP	Distressed	Distressed	10,664	81.0	16.7	
LOWELL POINT CDP	Non-Distressed	Non-Distressed	26,340	56.1	46.3	
LOWER KALSKAG CITY	Distressed	Distressed	7,970	78.8	33.3	
LUTAK CDP	Distressed	Distressed	12,377	66.7	25.0	
MANLEY HOT SPRINGS CDP	Distressed	Distressed	14,240	74.4	28.2	
MANOKOTAK CITY	Distressed	Distressed	10,486	82.8	23.2	
MARSHALL CITY	Distressed	Distressed	12,078	72.0	39.4	
MCCARTHY CDP	Distressed	Distressed	7,392	82.4	10.3	
MCGRATH CITY	Non-Distressed	Non-Distressed	18,725	61.3	34.7	
MCKINLEY PARK CDP	Non-Distressed	Distressed	15,131	66.8	27.4	Yes
MEADOW LAKES CDP	Non-Distressed	Non-Distressed	20,534	61.8	38.0	
MEKORYUK CITY	Non-Distressed	Non-Distressed	19,197	65.8	42.6	
MENDELTNA CDP	Non-Distressed	Non-Distressed	19,756	64.4	37.3	
MENTASTA LAKE CDP	Distressed	Distressed	12,105	76.1	19.6	
METLAKATLA	Non-Distressed	Non-Distressed	16,528	63.7	38.0	
MEYERS CHUCK	Distressed	N/A	ND	100.0	5.3	
MINTO CDP	Distressed	Distressed	9,398	79.7	27.5	
MOOSE CREEK CDP	Non-Distressed	Non-Distressed	16,711	64.0	37.1	
MOOSE PASS CDP	Non-Distressed	Distressed	18,159	66.5	30.5	
MOSQUITO LAKE CDP	Distressed	Distressed	11,708	76.1	24.4	
MOUNTAIN VILLAGE CITY	Distressed	Distressed	12,415	73.0	36.7	
MUD BAY CDP	Distressed	Distressed	13,501	69.5	29.7	
NAKNEK CDP	Non-Distressed	Non-Distressed	30,456	55.9	39.2	
NANWALEK CDP	Distressed	Distressed	10,163	76.1	32.1	

Distressed Community Status 2009, Alaska Communities by Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
NAPAKIAK CITY	Distressed	Distressed	9,049	79.2	40.7	
NAPASKIAK CITY	Non-Distressed	Distressed	10,889	69.9	37.7	Yes
NAUKATI BAY CDP	Distressed	Distressed	8,366	84.6	18.8	
NELCHINA CDP	Distressed	Distressed	16,341	71.2	25.4	
NELSON LAGOON CDP	Non-Distressed	Non-Distressed	38,340	65.4	36.5	
NENANA CITY	Non-Distressed	Non-Distressed	16,389	68.1	27.7	Yes
NEW STUYAHOK CITY	Distressed	Distressed	10,777	76.7	34.7	
NEWHALEN CITY	Non-Distressed	Non-Distressed	29,267	47.5	45.9	
NEWTOK CDP	Distressed	Distressed	8,396	80.7	43.6	
NIGHTMUTE CITY	Non-Distressed	Distressed	12,136	67.9	47.4	Yes
NIKISKI CDP	Non-Distressed	Non-Distressed	23,878	62.1	39.0	
NIKOLAEVSK CDP	Distressed	Distressed	20,578	79.0	21.9	
NIKOLAI CITY	Distressed	Distressed	6,674	86.1	13.9	
NIKOLSKI CDP	Non-Distressed	Non-Distressed	14,971	68.2	36.4	Yes
NINILCHIK CDP	Distressed	Distressed	16,037	73.6	24.1	
NOATAK CDP	Non-Distressed	Non-Distressed	16,047	69.5	47.4	
NOME CITY	Non-Distressed	Non-Distressed	28,859	49.1	49.7	
NONDALTON CITY	Distressed	Distressed	11,836	76.5	29.5	
NOORVIK CITY	Distressed	Distressed	13,930	71.9	28.8	
NORTH POLE CITY	Non-Distressed	Non-Distressed	19,706	60.2	41.4	
NORTHWAY CDP	Distressed	Distressed	10,830	74.7	26.5	
NORTHWAY JUNCTION CDP	Non-Distressed	Distressed	20,466	63.4	41.5	
NORTHWAY VILLAGE	Distressed	Distressed	11,333	77.6	24.1	
NUIQSUT CITY	Non-Distressed	Non-Distressed	18,796	57.6	34.6	
NULATO CITY	Distressed	Distressed	10,838	72.8	33.2	
NUNAM IQUA CITY	Distressed	Distressed	11,310	73.3	54.3	
NUNAPITCHUK CITY	Non-Distressed	Distressed	12,205	69.6	46.1	Yes
OLD HARBOR CITY	Distressed	Distressed	18,844	82.9	28.3	
OSCARVILLE CDP	Non-Distressed	Non-Distressed	21,932	48.3	62.1	
OUZINKIE CITY	Distressed	Non-Distressed	14,719	74.1	40.1	
PALMER CITY	Non-Distressed	Non-Distressed	19,863	61.8	40.2	
PAXSON CDP	Distressed	Distressed	16,385	80.0	15.0	
PEDRO BAY CDP	Non-Distressed	Non-Distressed	19,090	62.5	37.5	
PELICAN CITY	Distressed	Distressed	25,854	77.6	22.4	
PERRYVILLE CDP	Distressed	Distressed	15,266	77.1	29.2	
PETERSBURG CITY	Non-Distressed	Non-Distressed	35,319	69.6	33.1	
PETERSVILLE CDP	Non-Distressed	Non-Distressed	29,527	66.7	33.3	
PILOT POINT CITY	Non-Distressed	Non-Distressed	22,041	69.6	47.8	
PILOT STATION CITY	Distressed	Distressed	8,726	80.7	30.2	
PITKAS POINT CDP	Distressed	Distressed	8,229	81.1	32.1	

Distressed Community Status 2009, Alaska Communities by Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
PLATINUM CITY	Distressed	Distressed	10,158	82.4	35.3	
PLEASANT VALLEY CDP	Non-Distressed	Non-Distressed	19,967	61.0	36.8	
POINT BAKER CDP	Distressed	Distressed	ND	91.3	13.0	
POINT HOPE CITY	Non-Distressed	Distressed	14,582	63.0	30.9	Yes
POINT LAY CDP	Non-Distressed	Non-Distressed	17,115	55.7	32.9	
POINT MACKENZIE CDP	Non-Distressed	Distressed	16,721	69.9	30.8	Yes
POPE-VANNOY LANDING CDP	Distressed	Distressed	ND	100.0	0.0	
PORT ALEXANDER	Distressed	Distressed	33,538	90.2	12.2	
PORT ALSWORTH CDP	Distressed	Distressed	10,014	82.4	22.4	
PORT GRAHAM CDP	Distressed	Distressed	12,370	70.5	34.8	
PORT HEIDEN CITY	Non-Distressed	Non-Distressed	31,410	53.0	40.9	
PORT LIONS CITY	Non-Distressed	Distressed	18,225	72.3	32.7	Yes
PORT PROTECTION CDP	Distressed	Distressed	3,037	92.6	14.8	
PORTAGE CREEK CDP	Distressed	Distressed	ND	100.0	0.0	
PRIMROSE CDP	Non-Distressed	Non-Distressed	21,529	64.0	33.3	
PRUDHOE BAY	Non-Distressed	Non-Distressed	67,434	13.6	81.8	
QUINHAGAK CITY	Distressed	Distressed	11,186	75.6	33.2	
RAMPART CDP	Distressed	Distressed	9,945	78.9	47.4	
RED DEVIL CDP	Distressed	Distressed	7,895	86.7	23.3	
RED DOG MINE CDP	Non-Distressed	Non-Distressed	ND	0.0	100.0	
RIDGEWAY CDP	Non-Distressed	Non-Distressed	22,022	61.9	38.5	
RUBY CITY	Distressed	Distressed	14,524	70.7	36.8	
RUSSIAN MISSION CITY	Distressed	Distressed	10,357	74.9	37.0	
SAINT GEORGE CITY	Non-Distressed	Non-Distressed	19,695	66.2	33.8	
SAINT MARYS CITY	Non-Distressed	Distressed	14,656	66.4	37.4	
SAINT MICHAEL CITY	Non-Distressed	Non-Distressed	13,528	69.7	32.8	Yes
SAINT PAUL CITY	Non-Distressed	Non-Distressed	27,056	59.2	42.6	
SALAMATOF CDP	Non-Distressed	Non-Distressed	21,181	64.5	35.9	
SALCHA CDP	Non-Distressed	Non-Distressed	16,932	68.3	31.3	Yes
SAND POINT CITY	Non-Distressed	Non-Distressed	47,564	64.0	38.1	
SAVOONGA CITY	Distressed	Distressed	9,942	78.9	25.9	
SAXMAN CITY	Non-Distressed	Non-Distressed	15,142	66.9	37.0	
SCAMMON BAY CITY	Distressed	Distressed	8,506	80.8	30.6	
SELAWIK CITY	Distressed	Distressed	10,795	74.6	24.1	
SELDOVIA CITY	Distressed	Distressed	25,153	76.9	27.5	
SELDOVIA VILLAGE CDP	Non-Distressed	Non-Distressed	13,297	69.1	33.1	Yes
SEWARD CITY	Non-Distressed	Non-Distressed	25,657	57.0	42.1	
SHAGELUK CITY	Distressed	Distressed	7,903	82.1	23.9	
SHAKTOOLIK CITY	Non-Distressed	Non-Distressed	15,659	65.1	44.1	

Distressed Community Status 2009, Alaska Communities by Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
SHISHMAREF CITY	Distressed	Distressed	9,466	78.6	36.5	
SHUNGNAK CITY	Non-Distressed	Distressed	14,073	67.7	30.5	Yes
SILVER SPRINGS CDP	Non-Distressed	Non-Distressed	17,820	63.5	32.2	
SITKA CITY	Non-Distressed	Non-Distressed	24,706	58.7	43.3	
SKAGWAY CITY	Non-Distressed	Non-Distressed	18,753	59.6	34.0	
SKWENTNA CDP	Distressed	Distressed	5,032	88.6	7.1	
SLANA CDP	Distressed	Distressed	7,777	77.1	14.7	
SLEETMUTE CDP	Distressed	Distressed	8,650	80.0	36.9	
SOLDOTNA CITY	Non-Distressed	Non-Distressed	24,776	59.7	42.7	
SOUTH NAKNEK CDP	Non-Distressed	Non-Distressed	25,530	68.8	17.2	Yes
STEBBINS CITY	Distressed	Distressed	8,198	80.0	30.1	
STERLING CDP	Non-Distressed	Non-Distressed	23,807	60.9	39.5	
STEVENS VILLAGE CDP	Distressed	Distressed	7,016	85.7	25.0	
STONY RIVER CDP	Distressed	Distressed	10,181	80.6	27.8	
SUNRISE CDP	Non-Distressed	Non-Distressed	15,554	56.3	31.3	
SUSITNA CDP	Distressed	Distressed	10,582	80.8	11.5	
SUTTON-ALPINE CDP	Non-Distressed	Non-Distressed	17,872	64.2	33.2	
TAKOTNA CDP	Non-Distressed	Distressed	20,634	54.5	54.5	
TALKEETNA CDP	Non-Distressed	Distressed	16,717	66.5	34.3	
TANACROSS CDP	Distressed	Distressed	11,405	73.6	23.1	
TANAINA CDP	Non-Distressed	Non-Distressed	23,923	56.2	44.2	
TANANA CITY	Non-Distressed	Non-Distressed	14,408	63.2	34.8	
TATITLEK CDP	Distressed	Non-Distressed	14,513	77.8	30.6	
TAZLINA CDP	Non-Distressed	Non-Distressed	20,896	62.5	37.5	
TELLER CITY	Distressed	Distressed	11,405	72.2	38.1	
TENAKEE SPRINGS CITY	Distressed	Distressed	11,922	81.9	26.6	
TETLIN CDP	Distressed	Distressed	6,986	84.6	20.5	
THOMS PLACE	Distressed	Distressed	ND	62.5	25.0	
THORNE BAY CITY	Distressed	Distressed	12,986	75.3	25.8	
TOGIAK CITY	Distressed	Distressed	13,226	79.3	25.6	
TOK CDP	Non-Distressed	Distressed	16,574	66.5	33.1	
TOKSOOK BAY CITY	Distressed	Distressed	12,693	75.4	40.3	
TOLSONA CDP	Distressed	Distressed	11,188	72.4	24.1	
TONSINA CDP	Distressed	Distressed	11,312	76.2	20.6	
TRAPPER CREEK CDP	Distressed	Distressed	12,176	76.5	23.7	
TULUKSAK CDP	Distressed	Distressed	6,254	86.2	25.9	
TUNTUTULIAK CDP	Distressed	Distressed	11,458	73.4	35.2	
TUNUNAK CDP	Distressed	Distressed	9,981	79.3	35.7	
TWIN HILLS CDP	Distressed	Distressed	9,870	74.1	34.5	
TWO RIVERS CDP	Non-Distressed	Non-Distressed	23,622	51.7	46.5	

Distressed Community Status 2009, Alaska Communities by Place

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
TYONEK CDP	Non-Distressed	Distressed	13,438	65.8	33.3	
UGASHIK CDP	Distressed	Distressed	35,151	75.0	16.7	
UNALAKLEET CITY	Non-Distressed	Non-Distressed	18,593	64.7	37.2	
UNALASKA CITY	Non-Distressed	Non-Distressed	40,743	33.8	67.1	
UPPER KALSKAG CITY	Distressed	Distressed	10,477	75.5	31.3	
VALDEZ CITY	Non-Distressed	Non-Distressed	37,124	49.4	51.4	
VENETIE CDP	Distressed	Distressed	6,923	84.9	21.6	
WAINWRIGHT CITY	Non-Distressed	Non-Distressed	16,683	61.4	28.3	
WALES CITY	Non-Distressed	Distressed	12,225	69.1	46.8	Yes
WASILLA CITY	Non-Distressed	Non-Distressed	22,153	61.0	39.2	
WHALE PASS CDP	Distressed	Distressed	3,088	90.5	9.5	
WHITE MOUNTAIN CITY	Non-Distressed	Non-Distressed	13,572	66.9	43.1	
WHITESTONE CAMP CDP	Distressed	Non-Distressed	8,779	85.7	14.3	
WHITTIER CITY	Non-Distressed	Distressed	16,759	67.4	29.3	Yes
WILLOW CDP	Non-Distressed	Distressed	17,539	69.4	29.3	Yes
WILLOW CREEK CDP	Distressed	Distressed	9,720	77.6	23.1	
WISEMAN CDP	Distressed	Non-Distressed	18,332	76.9	23.1	
WOMENS BAY CDP	Non-Distressed	Non-Distressed	20,184	63.5	35.7	
WRANGELL CITY	Non-Distressed	Non-Distressed	20,648	68.1	31.8	Yes
Y CDP	Distressed	Distressed	12,583	75.5	25.6	
YAKUTAT	Non-Distressed	Non-Distressed	21,288	65.8	38.0	

Cells marked with ND were not able to be disclosed due to confidentiality policies.
Source: Alaska Department of Labor, Research and Analysis Section; Commercial Fisheries Entry Commission

Distressed Community Status 2009, Alaska Communities by Distressed Status

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
AKHIOK CITY	Distressed	Distressed	12,688	72.5	52.5	
AKIACHAK CDP	Distressed	Non-Distressed	11,477	75.1	27.8	
AKIAK CITY	Distressed	Non-Distressed	10,885	70.4	44.2	
ALAKANUK CITY	Distressed	Distressed	8,919	80.6	27.4	
ALATNA CDP	Distressed	Distressed	8,374	88.2	11.8	
ALCAN BORDER CDP	Distressed	Distressed	ND	100.0	0.0	
ALEKNAGIK CITY	Distressed	Distressed	18,970	70.3	29.7	
ALENEVA CDP	Distressed	Distressed	10,330	83.3	16.7	
ALLAKAKET ANVSA	Distressed	Distressed	8,554	80.8	27.2	
AMBLER CITY	Distressed	Non-Distressed	12,909	72.5	27.5	
ANGOON CITY	Distressed	Distressed	11,678	72.2	31.7	
ANVIK CITY	Distressed	Distressed	13,177	73.2	44.6	
ARCTIC VILLAGE CDP	Distressed	Distressed	9,874	78.4	26.7	
ATMAUTLUAK CDP	Distressed	Distressed	7,875	80.9	23.0	
BELUGA CDP	Distressed	Distressed	18,017	73.7	26.3	
BETTLES CITY	Distressed	Distressed	10,781	81.0	28.6	
BIG DELTA CDP	Distressed	Distressed	16,107	70.5	28.6	
BIRCH CREEK CDP	Distressed	Distressed	2,059	94.1	0.0	
BREVIG MISSION CITY	Distressed	Distressed	9,672	76.1	38.5	
CENTRAL CDP	Distressed	Distressed	10,536	83.8	20.0	
CHALKYITSIK CDP	Distressed	Distressed	11,012	71.2	39.0	
CHASE CDP	Distressed	Distressed	19,813	72.3	27.7	
CHEFORNAK CITY	Distressed	Distressed	11,206	78.0	45.5	
CHEVAK CITY	Distressed	Distressed	8,948	78.7	33.3	
CHICKEN CDP	Distressed	Distressed	ND	93.8	6.3	
CHIGNIK LAGOON	Distressed	Distressed	80,571	79.4	25.4	
CHIGNIK LAKE	Distressed	Non-Distressed	9,977	82.2	28.8	
CHINIAK CDP	Distressed	Non-Distressed	13,197	71.7	23.3	
CHISANA	Distressed	Distressed	ND	100.0	0.0	
CHITINA CDP	Distressed	Distressed	9,344	81.9	27.7	
CHUATHBALUK CITY	Distressed	Distressed	10,981	76.7	35.0	
CIRCLE CDP	Distressed	Distressed	4,813	92.3	12.8	
CLAM GULCH CDP	Distressed	Distressed	21,990	71.8	25.8	
CLARKS POINT CITY	Distressed	Distressed	10,431	88.9	33.3	
COOPER LANDING CDP	Distressed	Distressed	13,274	76.9	19.8	
COVENANT LIFE CDP	Distressed	Distressed	10,881	73.8	29.2	
CROOKED CREEK CDP	Distressed	Distressed	9,767	76.7	34.9	
CROWN POINT CDP	Distressed	Distressed	14,808	64.0	26.0	
DOT LAKE CDP	Distressed	Distressed	6,434	76.2	23.8	
DRY CREEK CDP	Distressed	Distressed	2,280	93.3	5.0	

Distressed Community Status 2009, Alaska Communities by Distressed Status

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
EAGLE CITY	Distressed	Distressed	8,532	79.0	23.5	
EAGLE VILLAGE	Distressed	Distressed	6,871	86.6	17.9	
EDNA BAY	Distressed	Distressed	20,202	82.4	11.8	
EEK CITY	Distressed	Distressed	10,585	76.6	37.8	
EIELSON AFB	Distressed	Distressed	4,757	88.2	12.0	
EKWOK CITY	Distressed	Distressed	12,338	72.0	37.8	
ELFIN COVE CDP	Distressed	Distressed	38,219	87.9	24.2	
ELIM CITY	Distressed	Distressed	11,293	71.9	36.2	
EMMONAK CITY	Distressed	Distressed	12,814	71.1	35.4	
EXCURSION INLET CDP	Distressed	Distressed	ND	76.9	15.4	
FERRY CDP	Distressed	Non-Distressed	10,708	76.7	16.7	
FORT GREELY CDP	Distressed	Distressed	13,206	79.2	17.5	
FOX RIVER CDP	Distressed	Distressed	5,044	87.4	15.7	
FUNNY RIVER CDP	Distressed	Distressed	16,188	71.3	28.4	
GAMBELL CITY	Distressed	Distressed	8,954	77.9	31.7	
GAME CREEK CDP	Distressed	Distressed	ND	100.0	0.0	
GLACIER VIEW CDP	Distressed	Distressed	15,934	71.2	23.7	
GOODNEWS BAY CITY	Distressed	Distressed	12,293	76.4	29.7	
GRAYLING CITY	Distressed	Distressed	7,100	82.7	27.3	
GULKANA CDP	Distressed	Distressed	12,411	70.4	33.8	
GUSTAVUS CDP	Distressed	Distressed	11,866	82.2	19.0	
HALIBUT COVE CDP	Distressed	Distressed	27,996	90.9	12.1	
HAPPY VALLEY CDP	Distressed	Distressed	13,150	75.9	22.3	
HARDING-BIRCH LAKES CDP	Distressed	Non-Distressed	16,571	70.1	25.7	
HEALY LAKE CDP	Distressed	Non-Distressed	5,296	81.8	27.3	
HOBART BAY CDP	Distressed	Distressed	ND	100.0	0.0	
HOLLIS CDP	Distressed	Distressed	13,883	71.7	31.5	
HOLY CROSS CITY	Distressed	Distressed	7,197	81.1	28.7	
HOOPER BAY CITY	Distressed	Distressed	8,465	79.5	30.2	
HOPE CDP	Distressed	Distressed	11,380	77.6	19.4	
HUSLIA CITY	Distressed	Distressed	9,150	76.6	22.3	
HYDABURG CITY	Distressed	Distressed	16,977	72.5	24.8	
HYDER CDP	Distressed	Distressed	5,692	89.6	11.7	
KAKE CITY	Distressed	Distressed	14,190	71.2	36.2	
KALTAG CITY	Distressed	Distressed	9,308	78.7	24.7	
KARLUK CDP	Distressed	Distressed	12,212	73.9	43.5	
KASIGLUK CDP	Distressed	Distressed	9,131	80.0	36.5	
KENNY LAKE CDP	Distressed	Distressed	12,418	75.1	25.9	
KIPNUK CDP	Distressed	Distressed	9,404	79.5	31.0	
KIVALINA CITY	Distressed	Distressed	12,131	75.4	32.9	

Distressed Community Status 2009, Alaska Communities by Distressed Status

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
KLUKWAN CDP	Distressed	Non-Distressed	12,394	71.1	38.9	
KODIAK STATION CDP	Distressed	Distressed	6,960	85.3	17.7	
KOKHANOK CDP	Distressed	Distressed	11,167	78.4	30.4	
KOLIGANEK CDP	Distressed	Non-Distressed	13,862	72.0	30.5	
KONGIGANAK CDP	Distressed	Distressed	8,975	81.0	35.4	
KOTLIK CITY	Distressed	Distressed	9,486	79.5	32.6	
KOYUK CITY	Distressed	Distressed	11,414	75.3	38.9	
KOYUKUK CITY	Distressed	Distressed	8,867	78.8	37.9	
KUPREANOF CITY	Distressed	Distressed	8,198	75.0	25.0	
KWETHLUK CITY	Distressed	Distressed	9,523	76.0	30.1	
KWIGILLINGOK CDP	Distressed	Distressed	11,249	71.8	38.7	
LAKE LOUISE CDP	Distressed	Distressed	12,629	83.3	16.7	
LAKE MINCHUMINA CDP	Distressed	Distressed	ND	73.3	20.0	
LIVENGOOD CDP	Distressed	Distressed	10,664	81.0	16.7	
LOWER KALSKAG CITY	Distressed	Distressed	7,970	78.8	33.3	
LUTAK CDP	Distressed	Distressed	12,377	66.7	25.0	
MANLEY HOT SPRINGS CDP	Distressed	Distressed	14,240	74.4	28.2	
MANOKOTAK CITY	Distressed	Distressed	10,486	82.8	23.2	
MARSHALL CITY	Distressed	Distressed	12,078	72.0	39.4	
MCCARTHY CDP	Distressed	Distressed	7,392	82.4	10.3	
MENTASTA LAKE CDP	Distressed	Distressed	12,105	76.1	19.6	
MEYERS CHUCK	Distressed	N/A	ND	100.0	5.3	
MINTO CDP	Distressed	Distressed	9,398	79.7	27.5	
MOSQUITO LAKE CDP	Distressed	Distressed	11,708	76.1	24.4	
MOUNTAIN VILLAGE CITY	Distressed	Distressed	12,415	73.0	36.7	
MUD BAY CDP	Distressed	Distressed	13,501	69.5	29.7	
NANWALEK CDP	Distressed	Distressed	10,163	76.1	32.1	
NAPAKIAK CITY	Distressed	Distressed	9,049	79.2	40.7	
NAUKATI BAY CDP	Distressed	Distressed	8,366	84.6	18.8	
NELCHINA CDP	Distressed	Distressed	16,341	71.2	25.4	
NEW STUYAHOK CITY	Distressed	Distressed	10,777	76.7	34.7	
NEWTOK CDP	Distressed	Distressed	8,396	80.7	43.6	
NIKOLAEVSK CDP	Distressed	Distressed	20,578	79.0	21.9	
NIKOLAI CITY	Distressed	Distressed	6,674	86.1	13.9	
NINILCHIK CDP	Distressed	Distressed	16,037	73.6	24.1	
NONDALTON CITY	Distressed	Distressed	11,836	76.5	29.5	
NOORVIK CITY	Distressed	Distressed	13,930	71.9	28.8	
NORTHWAY CDP	Distressed	Distressed	10,830	74.7	26.5	
NORTHWAY VILLAGE	Distressed	Distressed	11,333	77.6	24.1	
NULATO CITY	Distressed	Distressed	10,838	72.8	33.2	

Distressed Community Status 2009, Alaska Communities by Distressed Status

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
NUNAM IQUA CITY	Distressed	Distressed	11,310	73.3	54.3	
OLD HARBOR CITY	Distressed	Distressed	18,844	82.9	28.3	
OUZINKIE CITY	Distressed	Non-Distressed	14,719	74.1	40.1	
PAXSON CDP	Distressed	Distressed	16,385	80.0	15.0	
PELICAN CITY	Distressed	Distressed	25,854	77.6	22.4	
PERRYVILLE CDP	Distressed	Distressed	15,266	77.1	29.2	
PILOT STATION CITY	Distressed	Distressed	8,726	80.7	30.2	
PITKAS POINT CDP	Distressed	Distressed	8,229	81.1	32.1	
PLATINUM CITY	Distressed	Distressed	10,158	82.4	35.3	
POINT BAKER CDP	Distressed	Distressed	ND	91.3	13.0	
POPE-VANNOY LANDING CDP	Distressed	Distressed	ND	100.0	0.0	
PORT ALEXANDER	Distressed	Distressed	33,538	90.2	12.2	
PORT ALSWORTH CDP	Distressed	Distressed	10,014	82.4	22.4	
PORT GRAHAM CDP	Distressed	Distressed	12,370	70.5	34.8	
PORT PROTECTION CDP	Distressed	Distressed	3,037	92.6	14.8	
PORTAGE CREEK CDP	Distressed	Distressed	ND	100.0	0.0	
QUINHAGAK CITY	Distressed	Distressed	11,186	75.6	33.2	
RAMPART CDP	Distressed	Distressed	9,945	78.9	47.4	
RED DEVIL CDP	Distressed	Distressed	7,895	86.7	23.3	
RUBY CITY	Distressed	Distressed	14,524	70.7	36.8	
RUSSIAN MISSION CITY	Distressed	Distressed	10,357	74.9	37.0	
SAVOONGA CITY	Distressed	Distressed	9,942	78.9	25.9	
SCAMMON BAY CITY	Distressed	Distressed	8,506	80.8	30.6	
SELAWIK CITY	Distressed	Distressed	10,795	74.6	24.1	
SELDOVIA CITY	Distressed	Distressed	25,153	76.9	27.5	
SHAGELUK CITY	Distressed	Distressed	7,903	82.1	23.9	
SHISHMAREF CITY	Distressed	Distressed	9,466	78.6	36.5	
SKWENTNA CDP	Distressed	Distressed	5,032	88.6	7.1	
SLANA CDP	Distressed	Distressed	7,777	77.1	14.7	
SLEETMUTE CDP	Distressed	Distressed	8,650	80.0	36.9	
STEBBINS CITY	Distressed	Distressed	8,198	80.0	30.1	
STEVENS VILLAGE CDP	Distressed	Distressed	7,016	85.7	25.0	
STONY RIVER CDP	Distressed	Distressed	10,181	80.6	27.8	
SUSITNA CDP	Distressed	Distressed	10,582	80.8	11.5	
TANACROSS CDP	Distressed	Distressed	11,405	73.6	23.1	
TATITLEK CDP	Distressed	Non-Distressed	14,513	77.8	30.6	
TELLER CITY	Distressed	Distressed	11,405	72.2	38.1	
TENAKEE SPRINGS CITY	Distressed	Distressed	11,922	81.9	26.6	
TETLIN CDP	Distressed	Distressed	6,986	84.6	20.5	

Distressed Community Status 2009, Alaska Communities by Distressed Status

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
THOMS PLACE	Distressed	Distressed	ND	62.5	25.0	
THORNE BAY CITY	Distressed	Distressed	12,986	75.3	25.8	
TOGIAK CITY	Distressed	Distressed	13,226	79.3	25.6	
TOKSOOK BAY CITY	Distressed	Distressed	12,693	75.4	40.3	
TOLSONA CDP	Distressed	Distressed	11,188	72.4	24.1	
TONSINA CDP	Distressed	Distressed	11,312	76.2	20.6	
TRAPPER CREEK CDP	Distressed	Distressed	12,176	76.5	23.7	
TULUKSAK CDP	Distressed	Distressed	6,254	86.2	25.9	
TUNTUTULIAK CDP	Distressed	Distressed	11,458	73.4	35.2	
TUNUNAK CDP	Distressed	Distressed	9,981	79.3	35.7	
TWIN HILLS CDP	Distressed	Distressed	9,870	74.1	34.5	
UGASHIK CDP	Distressed	Distressed	35,151	75.0	16.7	
UPPER KALSKAG CITY	Distressed	Distressed	10,477	75.5	31.3	
VENETIE CDP	Distressed	Distressed	6,923	84.9	21.6	
WHALE PASS CDP	Distressed	Distressed	3,088	90.5	9.5	
WHITESTONE CAMP CDP	Distressed	Non-Distressed	8,779	85.7	14.3	
WILLOW CREEK CDP	Distressed	Distressed	9,720	77.6	23.1	
WISEMAN CDP	Distressed	Non-Distressed	18,332	76.9	23.1	
Y CDP	Distressed	Distressed	12,583	75.5	25.6	
ADAK CITY	Non-Distressed	Non-Distressed	22,785	60.7	26.8	
AKUTAN CITY	Non-Distressed	Non-Distressed	28,396	41.9	72.0	
ANAKTUVUK PASS CITY	Non-Distressed	Non-Distressed	16,441	63.1	33.3	
ANCHOR POINT CDP	Non-Distressed	Non-Distressed	17,677	68.7	30.0	Yes
ANCHORAGE	Non-Distressed	Non-Distressed	25,814	53.7	46.9	
ANDERSON CITY	Non-Distressed	Non-Distressed	18,923	68.6	31.4	Yes
ANIAK CITY	Non-Distressed	Non-Distressed	19,790	57.8	42.2	
ATKA CITY	Non-Distressed	Non-Distressed	25,377	46.9	63.3	
ATQASUK CITY	Non-Distressed	Non-Distressed	16,637	61.7	34.4	
BARROW CITY	Non-Distressed	Non-Distressed	29,072	47.8	41.8	
BEAR CREEK CDP	Non-Distressed	Non-Distressed	21,559	53.9	44.0	
BEAVER CDP	Non-Distressed	Distressed	11,809	67.8	37.3	Yes
BETHEL CITY	Non-Distressed	Non-Distressed	28,323	47.8	49.0	
BIG LAKE CDP	Non-Distressed	Non-Distressed	19,451	65.2	35.0	
BUCKLAND CITY	Non-Distressed	Non-Distressed	14,769	67.2	32.1	Yes
BUFFALO SOAPSTONE CDP	Non-Distressed	Non-Distressed	21,950	57.0	41.6	
BUTTE CDP	Non-Distressed	Non-Distressed	22,156	60.0	40.3	
CANTWELL CDP	Non-Distressed	Non-Distressed	18,355	65.5	31.6	
CHENEGA CDP	Non-Distressed	Non-Distressed	20,544	46.9	44.9	
CHICKALOON CDP	Non-Distressed	Non-Distressed	18,802	65.7	32.9	
CHIGNIK CITY	Non-Distressed	Non-Distressed	50,220	44.9	51.0	

Distressed Community Status 2009, Alaska Communities by Distressed Status

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
CHISTOCHINA CDP	Non-Distressed	Non-Distressed	17,326	67.1	34.2	
COFFMAN COVE CITY	Non-Distressed	Distressed	17,621	65.2	32.6	
COHOE CDP	Non-Distressed	Non-Distressed	17,821	68.8	30.4	Yes
COLD BAY CITY	Non-Distressed	Non-Distressed	29,035	46.3	50.0	
COLDFOOT CDP	Non-Distressed	Non-Distressed	21,002	57.9	42.1	
COLLEGE CDP	Non-Distressed	Non-Distressed	24,633	53.3	46.6	
COPPER CENTER CDP	Non-Distressed	Non-Distressed	18,208	68.4	33.7	
COPPERVILLE CDP	Non-Distressed	Non-Distressed	22,216	59.6	42.6	
CORDOVA CITY	Non-Distressed	Non-Distressed	37,062	62.3	36.0	
CRAIG CITY	Non-Distressed	Non-Distressed	23,289	65.0	38.1	
DEERING CITY	Non-Distressed	Non-Distressed	16,491	60.9	43.5	
DELTA JUNCTION CITY	Non-Distressed	Non-Distressed	21,322	64.8	35.3	
DELTANA CDP	Non-Distressed	Non-Distressed	17,868	64.9	33.0	
DIAMOND RIDGE CDP	Non-Distressed	N/A	17,447	66.8	33.5	
DILLINGHAM CITY	Non-Distressed	Non-Distressed	29,258	50.8	46.7	
DIOMEDE CITY	Non-Distressed	Non-Distressed	14,117	63.9	51.4	
DOT LAKE VILLAGE	Non-Distressed	Distressed	11,888	69.2	30.8	Yes
EGEGIK CITY	Non-Distressed	Non-Distressed	26,726	64.0	34.0	
ESTER CDP	Non-Distressed	Non-Distressed	24,875	52.3	46.2	
EVANSVILLE CDP	Non-Distressed	Non-Distressed	31,679	40.0	60.0	
FAIRBANKS CITY	Non-Distressed	Non-Distressed	18,929	60.8	40.4	
FALSE PASS CITY	Non-Distressed	Non-Distressed	57,770	57.7	50.0	
FARM LOOP CDP	Non-Distressed	Non-Distressed	21,527	62.3	39.4	
FISHHOOK CDP	Non-Distressed	Non-Distressed	24,566	57.7	42.7	
FORT YUKON CITY	Non-Distressed	Non-Distressed	13,712	68.2	33.0	Yes
FOUR MILE ROAD CDP	Non-Distressed	Non-Distressed	31,644	53.3	53.3	
FOX CDP	Non-Distressed	Non-Distressed	26,995	52.0	45.6	
FRITZ CREEK CDP	Non-Distressed	Distressed	16,422	68.7	31.8	Yes
GAKONA CDP	Non-Distressed	Non-Distressed	18,410	62.8	36.1	
GALENA CITY	Non-Distressed	Non-Distressed	22,236	54.5	37.9	
GATEWAY CDP	Non-Distressed	Non-Distressed	25,339	57.1	43.0	
GLENNALLEN CDP	Non-Distressed	Non-Distressed	17,538	67.8	36.5	
GOLOVIN CITY	Non-Distressed	Non-Distressed	17,194	55.6	60.6	
HAINES CDP	Non-Distressed	Non-Distressed	17,640	70.5	31.4	Yes
HEALY CDP	Non-Distressed	Non-Distressed	23,048	60.6	37.3	
HOMER CITY	Non-Distressed	Non-Distressed	33,217	68.6	32.2	Yes
HOONAH CITY	Non-Distressed	Distressed	16,366	72.0	31.2	Yes
HOUSTON CITY	Non-Distressed	Non-Distressed	17,539	63.9	36.4	
HUGHES CITY	Non-Distressed	Distressed	12,101	65.6	49.2	
IGIUGIG CITY	Non-Distressed	Non-Distressed	19,254	58.6	55.2	
ILIAMNA CITY	Non-Distressed	Non-Distressed	26,022	51.1	42.9	

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Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
JUNEAU CITY	Non-Distressed	Non-Distressed	25,495	50.7	49.8	
KACHEMAK CITY	Non-Distressed	Non-Distressed	16,236	68.4	31.1	Yes
KAKTOVIK CITY	Non-Distressed	Non-Distressed	21,552	53.4	45.5	
KALIFORNSKY CDP	Non-Distressed	Non-Distressed	26,574	57.8	43.3	
KASAAN CITY	Non-Distressed	Distressed	14,516	66.7	35.9	
KASILOF CDP	Non-Distressed	Non-Distressed	27,574	66.3	34.6	
KENAI CITY	Non-Distressed	Non-Distressed	24,894	58.5	43.3	
KETCHIKAN CITY	Non-Distressed	Non-Distressed	22,973	56.2	45.0	
KIANA CITY	Non-Distressed	Non-Distressed	15,056	71.7	33.1	Yes
KING COVE CITY	Non-Distressed	Non-Distressed	41,778	63.5	36.2	
KING SALMON CDP	Non-Distressed	Non-Distressed	32,077	48.8	38.4	
KLAWOCK CITY	Non-Distressed	Non-Distressed	16,570	66.8	36.0	
KNIK RIVER CDP	Non-Distressed	Non-Distressed	22,980	59.1	39.7	
KNIK-FAIRVIEW CDP	Non-Distressed	Non-Distressed	24,329	56.4	43.3	
KOBUK CITY	Non-Distressed	Non-Distressed	15,458	68.4	28.9	Yes
KODIAK CITY	Non-Distressed	Non-Distressed	42,358	55.6	51.4	
KOTZEBUE CITY	Non-Distressed	Non-Distressed	27,127	52.0	46.7	
LAKES CDP	Non-Distressed	Non-Distressed	24,670	58.3	42.6	
LARSEN BAY CITY	Non-Distressed	Non-Distressed	17,675	70.2	31.6	Yes
LAZY MOUNTAIN CDP	Non-Distressed	Non-Distressed	20,643	63.5	36.3	
LEVELOCK CDP	Non-Distressed	Non-Distressed	18,100	69.2	32.7	Yes
LIME VILLAGE CDP	Non-Distressed	Distressed	11,676	64.3	35.7	
LOWELL POINT CDP	Non-Distressed	Non-Distressed	26,340	56.1	46.3	
MCGRATH CITY	Non-Distressed	Non-Distressed	18,725	61.3	34.7	
MCKINLEY PARK CDP	Non-Distressed	Distressed	15,131	66.8	27.4	Yes
MEADOW LAKES CDP	Non-Distressed	Non-Distressed	20,534	61.8	38.0	
MEKORYUK CITY	Non-Distressed	Non-Distressed	19,197	65.8	42.6	
MENDELTNA CDP	Non-Distressed	Non-Distressed	19,756	64.4	37.3	
METLAKATLA	Non-Distressed	Non-Distressed	16,528	63.7	38.0	
MOOSE CREEK CDP	Non-Distressed	Non-Distressed	16,711	64.0	37.1	
MOOSE PASS CDP	Non-Distressed	Distressed	18,159	66.5	30.5	
NAKNEK CDP	Non-Distressed	Non-Distressed	30,456	55.9	39.2	
NAPASKIAK CITY	Non-Distressed	Distressed	10,889	69.9	37.7	Yes
NELSON LAGOON CDP	Non-Distressed	Non-Distressed	38,340	65.4	36.5	
NENANA CITY	Non-Distressed	Non-Distressed	16,389	68.1	27.7	Yes
NEWHALEN CITY	Non-Distressed	Non-Distressed	29,267	47.5	45.9	
NIGHTMUTE CITY	Non-Distressed	Distressed	12,136	67.9	47.4	Yes
NIKISKI CDP	Non-Distressed	Non-Distressed	23,878	62.1	39.0	
NIKOLSKI CDP	Non-Distressed	Non-Distressed	14,971	68.2	36.4	Yes
NOATAK CDP	Non-Distressed	Non-Distressed	16,047	69.5	47.4	
NOME CITY	Non-Distressed	Non-Distressed	28,859	49.1	49.7	

Distressed Community Status 2009, Alaska Communities by Distressed Status

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
NORTH POLE CITY	Non-Distressed	Non-Distressed	19,706	60.2	41.4	
NORTHWAY JUNCTION CDP	Non-Distressed	Distressed	20,466	63.4	41.5	
NUIQSUT CITY	Non-Distressed	Non-Distressed	18,796	57.6	34.6	
NUNAPITCHUK CITY	Non-Distressed	Distressed	12,205	69.6	46.1	Yes
OSCARVILLE CDP	Non-Distressed	Non-Distressed	21,932	48.3	62.1	
PALMER CITY	Non-Distressed	Non-Distressed	19,863	61.8	40.2	
PEDRO BAY CDP	Non-Distressed	Non-Distressed	19,090	62.5	37.5	
PETERSBURG CITY	Non-Distressed	Non-Distressed	35,319	69.6	33.1	
PETERSVILLE CDP	Non-Distressed	Non-Distressed	29,527	66.7	33.3	
PILOT POINT CITY	Non-Distressed	Non-Distressed	22,041	69.6	47.8	
PLEASANT VALLEY CDP	Non-Distressed	Non-Distressed	19,967	61.0	36.8	
POINT HOPE CITY	Non-Distressed	Distressed	14,582	63.0	30.9	Yes
POINT LAY CDP	Non-Distressed	Non-Distressed	17,115	55.7	32.9	
POINT MACKENZIE CDP	Non-Distressed	Distressed	16,721	69.9	30.8	Yes
PORT HEIDEN CITY	Non-Distressed	Non-Distressed	31,410	53.0	40.9	
PORT LIONS CITY	Non-Distressed	Distressed	18,225	72.3	32.7	Yes
PRIMROSE CDP	Non-Distressed	Non-Distressed	21,529	64.0	33.3	
PRUDHOE BAY	Non-Distressed	Non-Distressed	67,434	13.6	81.8	
RED DOG MINE CDP	Non-Distressed	Non-Distressed	ND	0.0	100.0	
RIDGEWAY CDP	Non-Distressed	Non-Distressed	22,022	61.9	38.5	
SAINT GEORGE CITY	Non-Distressed	Non-Distressed	19,695	66.2	33.8	
SAINT MARYS CITY	Non-Distressed	Distressed	14,656	66.4	37.4	
SAINT MICHAEL CITY	Non-Distressed	Non-Distressed	13,528	69.7	32.8	Yes
SAINT PAUL CITY	Non-Distressed	Non-Distressed	27,056	59.2	42.6	
SALAMATOF CDP	Non-Distressed	Non-Distressed	21,181	64.5	35.9	
SALCHA CDP	Non-Distressed	Non-Distressed	16,932	68.3	31.3	Yes
SAND POINT CITY	Non-Distressed	Non-Distressed	47,564	64.0	38.1	
SAXMAN CITY	Non-Distressed	Non-Distressed	15,142	66.9	37.0	
SELDOVIA VILLAGE CDP	Non-Distressed	Non-Distressed	13,297	69.1	33.1	Yes
SEWARD CITY	Non-Distressed	Non-Distressed	25,657	57.0	42.1	
SHAKTOOLIK CITY	Non-Distressed	Non-Distressed	15,659	65.1	44.1	
SHUNGNAK CITY	Non-Distressed	Distressed	14,073	67.7	30.5	Yes
SILVER SPRINGS CDP	Non-Distressed	Non-Distressed	17,820	63.5	32.2	
SITKA CITY	Non-Distressed	Non-Distressed	24,706	58.7	43.3	
SKAGWAY CITY	Non-Distressed	Non-Distressed	18,753	59.6	34.0	
SOLDOTNA CITY	Non-Distressed	Non-Distressed	24,776	59.7	42.7	
SOUTH NAKNEK CDP	Non-Distressed	Non-Distressed	25,530	68.8	17.2	Yes
STERLING CDP	Non-Distressed	Non-Distressed	23,807	60.9	39.5	
SUNRISE CDP	Non-Distressed	Non-Distressed	15,554	56.3	31.3	
SUTTON-ALPINE CDP	Non-Distressed	Non-Distressed	17,872	64.2	33.2	

Distressed Community Status 2009, Alaska Communities by Distressed Status

Communities	2009 Distressed Status	2008 Distressed Status	Average earnings in 2008 from UI employment and fishing	% w/ 2008 earnings less than minimum wage of $14,872	% Employed all four quarters of 2008	Becomes Distressed in 2009 with 3% formula
TAKOTNA CDP	Non-Distressed	Distressed	20,634	54.5	54.5	
TALKEETNA CDP	Non-Distressed	Distressed	16,717	66.5	34.3	
TANAINA CDP	Non-Distressed	Non-Distressed	23,923	56.2	44.2	
TANANA CITY	Non-Distressed	Non-Distressed	14,408	63.2	34.8	
TAZLINA CDP	Non-Distressed	Non-Distressed	20,896	62.5	37.5	
TOK CDP	Non-Distressed	Distressed	16,574	66.5	33.1	
TWO RIVERS CDP	Non-Distressed	Non-Distressed	23,622	51.7	46.5	
TYONEK CDP	Non-Distressed	Distressed	13,438	65.8	33.3	
UNALAKLEET CITY	Non-Distressed	Non-Distressed	18,593	64.7	37.2	
UNALASKA CITY	Non-Distressed	Non-Distressed	40,743	33.8	67.1	
VALDEZ CITY	Non-Distressed	Non-Distressed	37,124	49.4	51.4	
WAINWRIGHT CITY	Non-Distressed	Non-Distressed	16,683	61.4	28.3	
WALES CITY	Non-Distressed	Distressed	12,225	69.1	46.8	Yes
WASILLA CITY	Non-Distressed	Non-Distressed	22,153	61.0	39.2	
WHITE MOUNTAIN CITY	Non-Distressed	Non-Distressed	13,572	66.9	43.1	
WHITTIER CITY	Non-Distressed	Distressed	16,759	67.4	29.3	Yes
WILLOW CDP	Non-Distressed	Distressed	17,539	69.4	29.3	Yes
WOMENS BAY CDP	Non-Distressed	Non-Distressed	20,184	63.5	35.7	
WRANGELL CITY	Non-Distressed	Non-Distressed	20,648	68.1	31.8	Yes
YAKUTAT	Non-Distressed	Non-Distressed	21,288	65.8	38.0	

Cells marked with ND were not able to be disclosed due to confidentiality policies.
Source: Alaska Department of Labor, Research and Analysis Section; Commercial Fisheries Entry Commission