



For a removal action within a wet marsh at a Formerly Used Defense Site at Davidson's Landing, located on Alaska's Seward Peninsula, all materials, supplies, equipment and personnel had to be transported in and out via a 45-minute helicopter ride. PHOTOS COURTESY AHTNA ENGINEERING SERVICES LLC

Logistics in the Last Frontier

When project delays in remote Alaska locations can result in \$50,000 per day in additional costs, proactively managing logistics and delegating authority to field managers is essential to stay on time and on budget.

By Karina Quintans, M.S.A.M.E.

Performing environmental engineering in remote and austere locations in Alaska often requires a level of effort in logistics planning far beyond that required in the Lower 48. Even during the summer when the majority of fieldwork is performed, snow and ice may still be encountered depending on the project location.

While devising the technical approach to execute the scope of work may be more or less "typical" in Alaska, the most complicating factor can be traveling in and out of a project site. Because of the lack of infrastructure, especially roads and airstrips, mobilizing to sites frequently requires chartered barges, single engine planes

and helicopters, which significantly adds to project costs. For comparison, in the Lower 48, transportation logistics represent approximately 5 percent to 10 percent of a project budget. In Alaska, that number can be as much as 40 percent.

Extreme weather, difficult or environmentally sensitive terrain such as tundra or permafrost, and the presence of bears, moose and other potentially dangerous wildlife also have a notable effect on project planning. As an Alaska Native Corporation, Ahtna Engineering Services has three decades of experience performing site investigations, remedial actions and other environmental engineering and construction projects in remote and austere locations throughout the state.

REACHING REMOTE LOCATIONS

Many places in Alaska are accessible only by air during the field season. The Federal Aviation Administration Station in Farewell is a World War II-era airstrip, located 160-mi northwest of Anchorage in the Alaskan Interior. A site investigation was needed to determine the horizontal and vertical extent of petroleum-contaminated soil across 16 areas of concern.

To perform the work in a location without

road access required the use of more than one type of plane for mobilization. A C-130 was used to transport heavy equipment, including a drill rig. Because this site also required full life support, a camp was established for 12 staff, with a kitchen, outhouse, potable water, and laundry facilities. Skyvan, Otter, and Navajo aircraft were chartered to mobilize supplies and personnel and to provide routine shipments of food and other camp supplies during field execution. As snow often falls in September, shortening the field season, Ahtna worked two shifts daily to maximize productivity during the long Alaskan summer days to complete the work ahead of schedule and within one field season.

Without airstrips to land an airplane, helicopters are another frequently used option in Alaska, which was the case for a drum removal performed at Davidson's Landing, a Formerly Used Defense Site located on the Seward Peninsula. The terrain at Davidson's Landing is characterized by continuous permafrost. During the summer, shallow and poorly drained soils cause a wet marsh environment. Executing a drum removal action with no means to land an airplane, nor any road access, required the use of helicopters.



Bear tracks are evident in the concrete casing of a newly installed groundwater monitoring well at Katmai National Park. Wildlife security is a serious consideration while performing work in Alaska.

Field personnel were transported daily to Davidson's by helicopter from Nome, which is 45 minutes away. Gear and equipment were slung by helicopter to the site. Upon project completion, Supersacks containing the removed drums were slung offsite by a helicopter and disposed of in Nome.

Tide schedules also can be critical for planning. Mobilizing to project sites with tide charts in hand and maintaining constant communication with logistics suppliers is essential to keep fieldwork progressing. At Biorika Island, Alaska, Ahtna performed a multi-phase remedial investigation and removal action project. The schedule was developed based on favorable tides so that logistics suppliers could deliver materials and supplies and transport the excavated contaminated soils. Barges were used during high tides and landing craft during low tides.

For a performance-based remedial action to remove petroleum-contaminated soil at five Federal Scout Armories in Western Alaska, the contract objective was to obtain an Alaska Department of Environmental Conservation "Cleanup Complete" determination and return the sites to an unrestricted land use scenario. The Alaska Army National Guard's federal program goal under the National Guard Bureau was to divest the properties back to the

villages, thus no institutional controls or property use restrictions could remain. By 2010, the village of Ambler, home to one of the armories, had endured low water in the river for the previous seven years, preventing the use of barges, which is the typical means to transport in fuel and cargo. In addition, during the spring thaw, ice jams form on the lower river, making barge entry impossible. Site access by air also was not possible, since the existing gravel airstrip was too small to accommodate C-130 cargo planes. To execute a removal action required strategically freezing a barge in place during the previous winter at an upstream location from where the ice jams form. This allowed the barge to proceed unhindered to retrieve and transport excavated soils down river as the upriver waters receded and the ice jam at the lower river near the Kotzebue Sound dissipated into the Bering Sea.

ADDRESSING WILDLIFE SECURITY

Wildlife security is a serious consideration while performing work in Alaska, specifically bear safety.

Bear spray is always a part of safety supplies. A Certified Bear Guard, the assignment of one field staff to monitor for bear activity during fieldwork, and the use of portable electric fences also are effective ways to protect sites against bear intrusions.

Brooks Camp, part of Katmai National Park, is frequented by bear-goers from around the world. All visitors are required to attend a bear awareness class to ensure safety. In 2009, bears were found digging holes on the beach, and with further investigation, a distinct odor of petroleum was detected and later confirmed as such. Several steps were necessary to perform soil excavation safely, including project members taking the mandatory bear awareness class and an electric fence installed around the stockpile of excavated contaminated soil to prevent bears from tampering with the material.

At another location within Brooks Camp where sampling was performed, one field staffer was assigned to watch for any bears wandering into and around the site during drilling activities. Even with this precaution, some work was compromised. Bear tracks were evident in the concrete castings of newly installed wells and a few well monuments had been dislodged by bears digging and pawing at the wells.

PROACTIVE MANAGEMENT

Specialized training and upfront planning can prepare staff for complex Alaska field conditions. Delayed Care First Aid training for instance provides staff with the knowledge to handle medical emergencies in locations where the field team would not be able to obtain medical help for at least a couple of days. An emergency medical evacuation plan should always be in place.

To effectively manage cost, field managers are best delegated the authority to make decisions, especially with time-sensitive operations. Project delays in remote locations can result in as much as \$50,000 per day in additional logistics costs.

Communication and flexibility is vital. What may be known regarding a site one day can completely change the next. Developing a strong knowledge base of regional conditions and logistics suppliers who understand the environmental and infrastructure challenges can make all the difference in successfully navigating the Last Frontier, and delivering projects on time and on budget.

TIME

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