

## **ALASKA DISTRICT TRIP REPORT**

**Project:** Denali Commission Mooring Points Phase 4

**Description:** McGrath Trip Report

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**Dates:** 26 - 27 July 2011

George Kalli and Nathan Epps traveled to the Kuskokwim River community of McGrath, Alaska via commercial air to conduct a site visit and scoping meeting related to potential installation of barge mooring points in the community. Three barge landing sites were investigated during the site visit. An overview of the community and barge landing sites is included as Figure 1.

A partial City Council meeting was conducted at 1700 hours. Not enough council members were present to attain the needed quorum for a full council meeting. Three council members participated in the meeting. Following is a summary of the information learned during the scoping meeting and site visit.

### **GENERAL**

McGrath is an interior community on the Kuskokwim River approximately 221 miles northwest of Anchorage and 269 miles southwest of Fairbanks. The community has a population of 346 according to the 2010 U.S. Census. Fuel and freight deliveries come to McGrath by barge up the Kuskokwim River. Deliveries are made with shallow draft vessels and are timed with high water events to navigate past shallow spots in the river. When the team arrived in McGrath, Crowley was in the process of offloading fuel at the downstream fuel headers (Photo 1). A tug and six barges were secured to the bank via a single bow line connected to a tree located at the top of bank (Photos 1 and 2). Small shallow draft barges are necessary in this section of the Kuskokwim River to avoid running aground in transit.

Historically, fuel has been delivered to the community by Crowley Maritime Corporation; however, this year the community also took fuel deliveries from Delta Western Inc.

Northstar Paving and Construction, an 8A contractor based in McGrath, provides some local access to heavy machinery; however, pile driving equipment was not seen in the community at the time of the visit.

Based on previous archaeological surveys and the types of known historic resources in the area, installing mooring points is unlikely to affect cultural resources.



Figure 1: McGrath Barge Landing Locations. Streamflow is from top to bottom.

### **CROWLEY FUEL LANDING SITE**

Barges deliver fuel to the municipal light and power fuel storage tanks and Crowley’s storage tanks by mooring along a 400-foot stretch of bank on the left bank (looking downstream) of the Kuskokwim River. This stretch of bank is bounded on the upstream end by a floating dock used by U.S. Fish and Wildlife Service (USFWS) for float plane operations and on the downstream end by a public boat launching area. The bank within this reach is actively eroding and has a steep cut face approximately 20 feet high (Photo 3). The bank above Ordinary High Water (OHW) appears to be composed of fine sand with some silt. This portion of the bank has a steep erosion face. Below OHW, the bank has a much shallower slope and is composed of sand and gravel with some silt. The top of bank is undercut several feet and is held in place by willows. Tonzona Avenue runs parallel to the bank and is 5 to 15 feet from the top of bank.

The fuel header is approximately 250 feet inland from the bank. Fuel delivery lines must cross Tonzona Avenue to access the fuel headers. It was observed that the fuel hose is passed through a culvert under the road to avoid disrupting traffic (Photo 4). From there, the hose runs along an

easement to the header. Currently, vessels delivering fuel at this point tie off to the top of bank vegetation.

Across from Tonzona Avenue near the fuel landing are a private house, a USFWS office, a bar, and a driveway on city property.

Skiffs use the bank between the boat launch and the USFWS office in the downstream portion of this reach. The boat launch is locally referred to as the AC ramp due to its proximity to the Alaska Commercial store. This is the main skiff beaching area for the community (Photo 5).

Evidence of former erosion control efforts is in the form of stacked 50 gallon barrels in sections of the bank (Photo 6). Also, garbage and debris is visible at the boat launch. Historically, the community disposed of garbage and debris in this area as a method of erosion control. The practice was discontinued many years ago. According to city representatives, the program was effective in reducing erosion rates in the area but has caused land use problems as garbage and debris are exposed by erosion.

The distance between the top of bank and the shoulder of Tonzona Avenue is quite narrow (Photo 7). The Corps team measured 2 feet from the top of bank to the shoulder at the tree where the barge anchor line was attached to, 4 feet at the point where the fuel hose passed beneath the road, and 15 feet in the area across from the bar.

The proposed location for the upstream mooring point at this site is illustrated in Figure 2 and shown in Photo 8. This point would secure the bow line of a barge to provide resistance to the current and prevent the vessel from drifting downstream with the current. This point is on the land side of Tonzona Avenue on city property within a driveway that was built to provide access to a church. The church is no longer there. GPS coordinates for this location are 62.95653° N, 155.59256° W. This location is approximately 125 feet upstream from the fuel hose culvert and across the street from the USFWS float plane dock. City administrator Natalie Baumgartner warned that some local citizens who believed they owned the real estate at this location could object to this recommendation; however, she is certain the land is city owned.

Due to proximity to roads, a below grade installation is recommended at this site. While the upstream mooring point will affect traffic along Tonzona Avenue while in use, it will not prevent access to any structures. Alternate routes are available. The minor traffic inconveniences are preferred to installing a mooring point within 5 feet of an actively eroding bank. City council members were informed of this impact and it was acceptable to them even though the fuel barges generally remain moored at this location overnight.

The proposed downstream mooring point location is approximately 275 feet downstream across the street from the bar (Photo 9–Photo 11, Figure 2). This point would secure the stern line of the barge and prevent the stern from drifting out into the river. GPS coordinates at this location are 62.95676° N, 155.59259° W. This point is on the river side of Tonzona Avenue

approximately 10 feet from the top of bank. This location is near the point where the bank begins to form a point bar at a major bend in the river and erosion rates are expected to be low. Also, no land was found to be available to install a mooring point on the land side of Tonzona Avenue near this location. Due to traffic along Tonzona Avenue, a below grade installation is also recommended for this location.

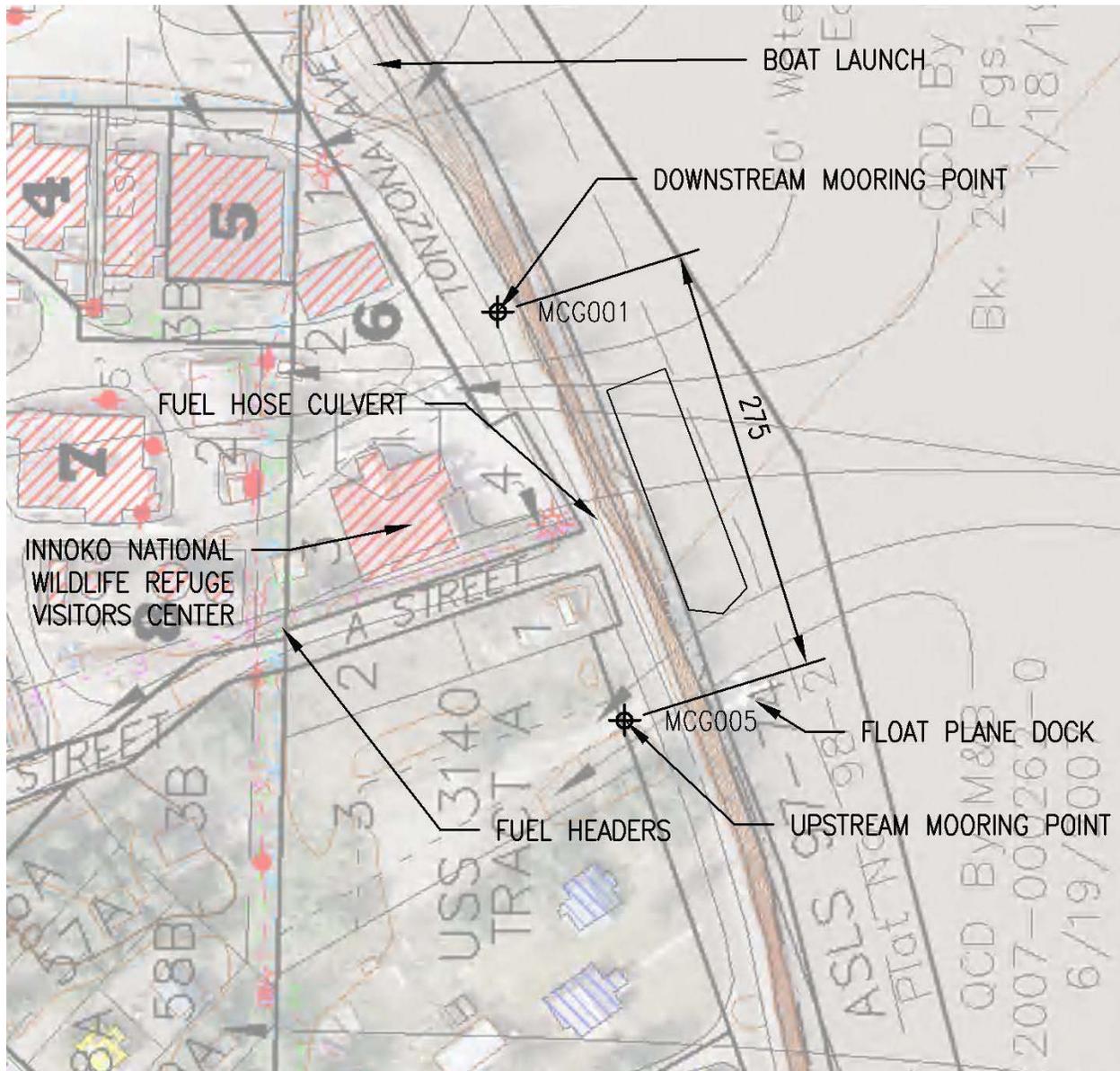


Figure 2: Proposed mooring point locations at the downstream landing site. Both mooring points are near the shoulders of Tonzona Avenue. Typical barge orientation for fuel delivery is shown.

The city has a proposal submitted to the Federal Emergency Management Agency (FEMA) to construct erosion protection along the entire bank shown in Figure 2. Funding availability for this project is uncertain at this time.

City council members requested that the community be given 1 to 2 days warning by the barge operator prior to the arrival of the fuel barge and that mooring lines crossing the road be clearly marked for traffic safety. These arrangements would be best handled between the city and the barge operators.



Photo 1: Three of six barges towed by the Crowley tug. One anchor line is used to moor all the barges. It can be seen extending to shore from the port side of the middle barge.



Photo 2: Tree that was used as a mooring point during Crowley fuel delivery. The anchor line is indicated by the white arrow.



Photo 3: Looking upstream along the left bank of the Kuskokwim River from the AC ramp.



Photo 4: Fuel hose passing through a culvert under Tonzona Avenue.



Photo 5: Crowley fuel barge moored at the Crowley fuel landing just upstream of skiffs beached adjacent to the AC ramp



Photo 6: Eroding stream bank in vicinity of the Crowley fuel landing with 50-gallon drums placed as an erosion protection measure.



Photo 7: View looking downstream along Tonzona Avenue showing the narrow spacing between the edge of the road and the eroding bank.



Photo 8: Corps engineer standing at proposed location for upstream mooring point at Crowley fuel landing, looking west.



Photo 9: Corps engineer standing at proposed location of Crowley fuel landing downstream mooring point, looking upstream.



Photo 10: Corps engineer standing at proposed location of the Crowley fuel landing downstream mooring point, looking downstream.



Photo 11: Corps engineer standing at proposed location of the Crowley fuel landing downstream mooring point, looking west.

## **CITY FUEL LANDING SITE**

Similar to the downstream fuel landing, this landing is along an actively eroding cut bank approximately 20 feet high. Much of the top of bank is undercut several feet with vegetation stabilizing the bank materials. At one location, a culvert supports a 6-foot undercut near the water supply intake (Photo 12). The bank near the water intake is very steep, and access to the intake is provided by an aluminum ladder stored at the site (Photo 13).

The current fuel header is within the fenced area of the tank farm across Takotna Avenue from the landing site (Photo 14). A decommissioned header was located outside the fenced area of the tank farm. City officials informed us that they recently decommissioned this header to eliminate costs associated with required inspections by the U.S Coast Guard.

There are no existing mooring points at this landing. Currently willows are used for that purpose.

A floating water intake structure for the city water supply is just upstream of this landing (Photo 15). It is tied off to a galvanized fence post driven into the ground and a small tree.

Just downstream of the tank farm are two small, currently occupied structures located between Takotna Avenue and the eroding stream bank (Photo 16). The location of these structures severely limits the potential sites for a downstream mooring point at this landing.

The Natural Resources Conservation Service (NRCS) is investigating construction of an erosion protection rip rap embankment along the section of bank where this landing is. The NRCS completed a similar structure slightly upstream in McGrath in 2009 (Photo 17). If this rip rap erosion protection structure was constructed, it would alter the method barge operators would use to secure their vessels against the current. They would not moor their vessels along the bank of the river because of the risk of hull damage to the barges from the rock. Either a landing area with its own mooring points would need to be incorporated into the design of the structure or fuel barges would anchor offshore and float in the fuel hoses. The likelihood of future funding availability for this project is not known.

The Corps recommends installing a single mooring point adjacent to Takotna Avenue near the upstream corner of the cleared area next to the water intake structure (Photo 18, Photo 19, Figure 3). This would be a bow line point similar in function to the upstream point at the downstream fuel landing. GPS coordinates of this location are 62.95046° N, 155.58800° W. Due to the proximity of this site to Takotna Avenue, a below grade installation is recommended at this location. Telephone lines run along the river side of Takotna Avenue (Photo 16, Photo 18). This mooring point must be field located to avoid any conflicts between the pile driver crane and the telephone wires.

No suitable location was found for a stern line mooring point.

Potential conflicts between barge mooring lines, the water intake structure, and water intake structure mooring lines must be avoided. City officials suggested that coordination with Jim Kaercher of KAE Engineering be initiated regarding the operation of the water intake structure. Subsequent coordination with Jim Kaercher has confirmed that installation of the proposed mooring point will not interfere with the existing water intake structure.

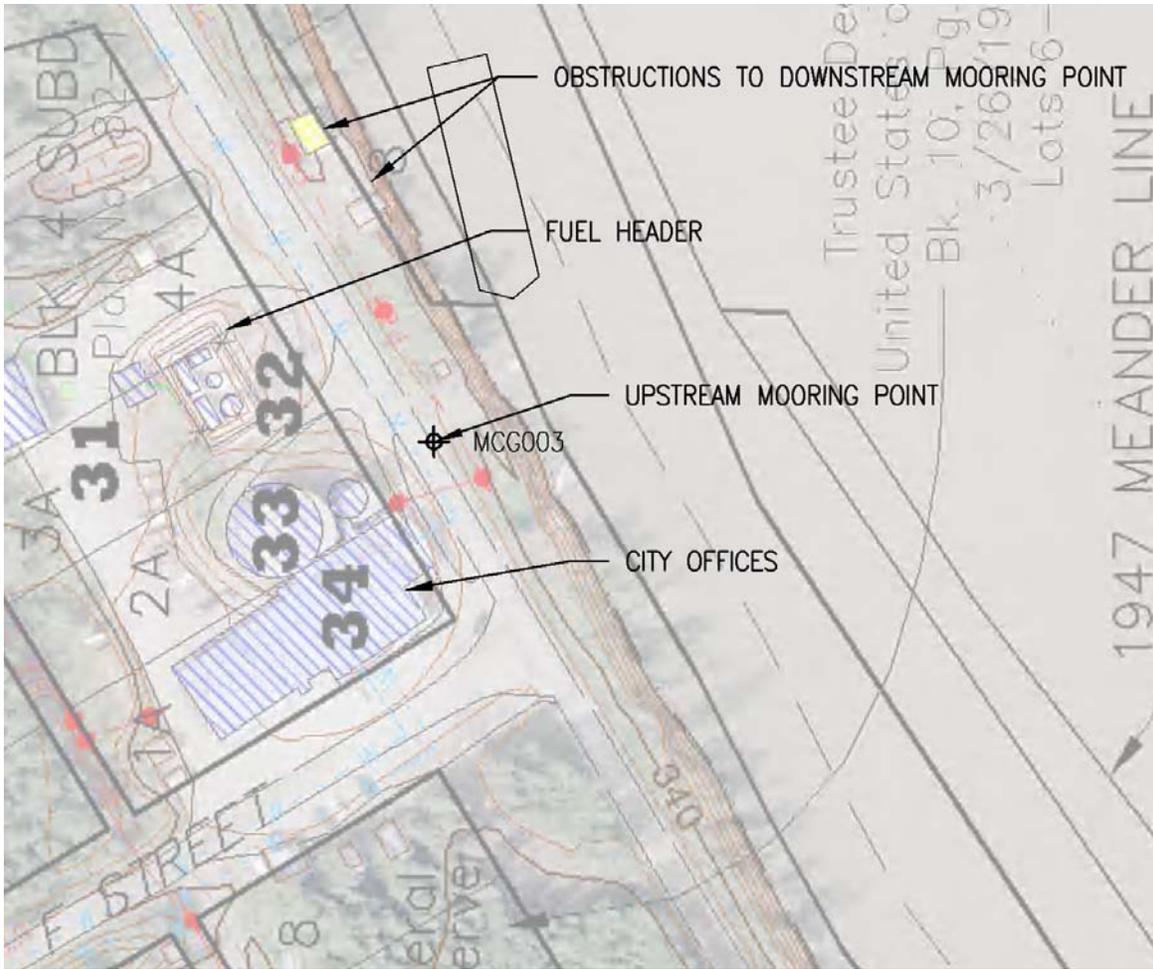


Figure 3: City fuel landing proposed mooring point and existing fuel header



Photo 12: Eroding stream bank at the city fuel landing site. Corps engineer is passing beneath a culvert that is supporting a mat of overhanging soil and vegetation above it.



Photo 13: Eroding stream bank at the city fuel landing with ladder required to get between the river and top of bank.



Photo 14: City tank farm. The fuel header is located near the right corner of the visible fencing.



Photo 15: City of McGrath drinking water intake structure located just upstream of city fuel landing.



Photo 16: Buildings located just upstream of city fuel landing. Note telephone wires.



Photo 17: Looking upstream at the riprap revetment designed by NRCS. This revetment lies upstream of the water intake structure.



Photo 18: Corps engineer standing at proposed location of the upstream city fuel landing mooring point looking downstream. Note telephone wires.



Photo 19: Corps engineer standing at proposed location of upstream city fuel landing mooring point, looking upstream.

## **FREIGHT LANDING SITE**

This landing consists of an unimproved ramp angling down to the river (Photo 20) with an adjacent unimproved staging area (Photo 21 and Photo 22). The landing is on a cut bank experiencing active erosion. The McGrath Barge Landing Scoping Analysis Report, completed by the Corps in January 2009, identified this area as a transition point for annual erosion rates. Immediately upstream, annual erosion rates were estimated at 1.7 feet, while immediately downstream, annual erosion was estimated at 7 feet. The rate at this site should be between those values.

During our site visit, a small tug and barge were moored at this landing. They were anchored, via two anchor lines, to an existing mooring point consisting of a 6-inch-diameter metal pipe protruding from the ground several feet from the top of the eroding bank (Photo 20). The pipe was leaning downstream and toward the river.

While the existing mooring point indicated a favorable location for an upstream mooring point, due to erosion concerns, the Corps recommends replacing it with a mooring point farther inland. The recommended location is across the access road to the landing area and approximately 20 feet upstream from where the access road meets the staging area clearing (Photo 21, Figure 4). This location is 22 feet from the top of bank and 78 feet from the existing mooring point. GPS coordinates of this location are 62.94037° N, 155.59039° W. Due to its proximity to the access road, a below grade installation is appropriate at this location. Use of this mooring point would require a mooring line to stretch across Park Avenue, which would cut off access to the staging area while the barge is unloading.

A small graveyard is within the wooded area adjacent to the proposed upstream mooring point location. The graveyard is sufficiently far enough from Park Avenue and the proposed mooring point location that no potential conflicts are expected.

The Corps recommends placing an additional below grade mooring point 200 feet downstream along the edge of the staging area, 52 feet inland from the top of bank, and 140 feet from the existing mooring point (Photo 22 and Photo 23, Figure 4). GPS coordinates of this location are 62.94003° N, 155.58943° W.

City administrator Natalie Baumgartner stated that Denali Commission funding to construct an improved barge landing at this location was imminent within the next year or two. If the Denali Commission expects to fund the construction of an improved landing facility here, the mooring points recommended here should not be installed. Rather, mooring points should be installed as part of the barge landing construction effort in conjunction with the landing design.

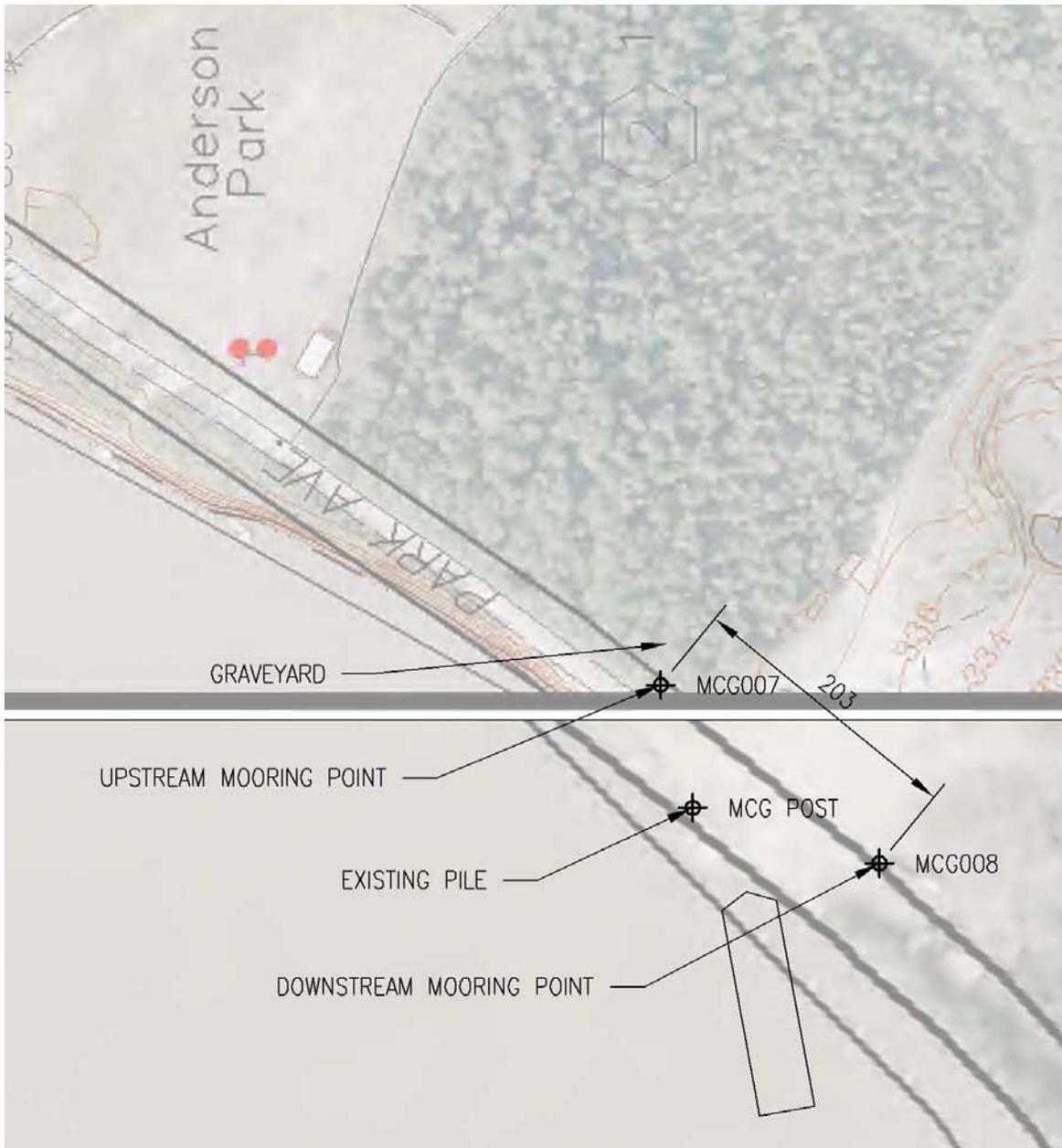


Figure 4: Freight Landing Site and Proposed Mooring Point Locations.



Photo 20: Small tug and barge anchored to mooring point at the freight landing site. The edge of the landing ramp is visible to the left of the photo.



Photo 21: Corps engineer standing at proposed location of upstream mooring point at the freight landing, looking downstream toward staging area.



Photo 22: Corps engineer standing at proposed location of downstream mooring point at edge of staging area at the freight landing, looking upstream.



Photo 23: Corps engineer standing at proposed location of downstream mooring point at edge of staging area at the freight landing, looking toward river.

## **RECOMMENDATIONS**

Two below grade mooring point installations, as described in this report, are recommended at the Crowley fuel landing.

One below grade mooring point installation, as described in this report, is recommended at the city fuel landing.

Two below grade mooring point installations, as described in this report, are tentatively recommended at the freight landing site. Final recommendation is contingent upon whether construction of an improved barge landing facility is imminent. If an improved barge landing facility is to be constructed, adequate mooring points should be included as part of the design. Otherwise, the mooring points described in this report should be installed.