



MACKINAW BAY DREDGING OPERATIONS WORK PLAN

**BNSF RAILWAY COMPANY
Whitefish, Montana
Flathead County, Montana**

MAY 21, 2012

Prepared for:

**BNSF Railway Company
825 Great Northern Blvd, Suite 105
Helena, Montana 59601**

Prepared by:

**Envirocon, Inc.
101 International Way
Missoula, MT 59808**

1.0 INTRODUCTION

The Mackinaw Bay area of Whitefish Lake is the location of a train derailment that occurred in July of 1989 resulting in the release of free diesel product into the lake. At the time of the derailment, BNSF conducted an immediate response action to mitigate the release. Further investigation has determined additional product located below the water surface that requires remedial actions. Envirocon was asked to provide a work approach and pricing to execute the removal of the impacted material from the lake bed. This work plan summarizes the approach of Envirocon to remove sediment containing diesel-range organics (DRO) present near the shoreline of Mackinaw Bay. The following is Envirocon's approach to the work.

2.0 SAFETY

Envirocon embraces a comprehensive safety culture, and working safely is inherent in our planning, and execution of any task. A designated Safety Officer is assigned to the Project and assists with work planning and task hazard analysis. For this project the Superintendant will also maintain responsibilities as the Safety Officer. An Envirocon Corporate Safety Manager, not on site full time, will have the responsibility for making periodic visits to the site. Additionally, Envirocon supervisors are trained in safety management and hazard identification.

The Mackinaw Bay work will maintain a site specific Health and Safety Plan (HASP). Specific tasks required for the work will be supplemented with a detailed Activity Hazard Analysis (AHA). These AHAs will serve as addendums to the HASP, comprised of identified hazards of each step involved in the tasks and appropriate mitigations. These AHAs will include tasks such as crane use, heavy equipment operations, barge assembly, and work on water procedures. Additionally, daily safety meetings are conducted prior to the start of work each day. These meetings include:

- Discussion of work hazards and mitigation;
- Safety observations from previous day's activities for discussion amongst the group;
- Safety topics for the day; and
- Plan of the Day, where coordination of activities are discussed in detail

3.0 MOBILIZATION AND CITY BEACH PREPARATIONS

The approach to the work begins with mobilization of equipment to the lake. Envirocon is planning to use modular barge systems that will be mobilized to the site. Mechanical dredging and the shuttle of excavated material require Envirocon to prepare the City Beach boat launch for the work.

Modifications will be required at City Beach. These modifications will include 4 truck-loads of washed 1 ½" cobble or round rock. The material we intend to use would be the same material currently in this portion of the beach and extending into the water. The shoreline will be extended with this rock approximately 24' into the lake, and 40' along the shoreline. We would place the material 1 to 2 feet in depth into the lake, bringing the material up the elevation of the water. The intent of this extension is to allow for 8' by 20' crane mats to be placed in a level position, above the water surface, and support the lake side of the crane outriggers. The material is also required to fit the crane on the beach, with outriggers extended, and maintain all components of the crane out of the water.

Additionally, 30' to 40' of jersey rail or ecology type concrete barriers would be placed into the water to support the material from sliding further into the lake, and support the outriggers of the crane.

Modifications for the protection of the public will also be required. This will include security fence delineating the South boat ramp from the North. Additionally, appropriate traffic controls such as reflective barricades, candles, and signage will be required to protect and delineate the public from the operations.

4.0 DREDGING OPERATIONS

Envirocon intends to mechanically excavate the sediment from Mackinaw Bay (MB) using a CAT320 excavator with a barge serving as the working platform. The excavator will be equipped with a rotating bucket that will allow the sediments to be excavated from the bottom up with a forward digging bucket attachment. This barge will be utilized for the sole purpose of supporting the excavator during the mechanical removal operations. This barge will be moved into location in Mackinaw Bay and held in place during excavation by spuds. As work progresses this barge will be relocated as needed with the support of boats.

The prevention of DRO release starts with dredging activities in Mackinaw Bay. The dredging operations will be enclosed by a silt curtain. This curtain, attached to the shoreline on both sides of the mechanical dredge barge will surround the excavating operations. A secondary silt curtain will be established between the mechanical dredge barge and the barge carrying roll-off containers. The secondary system of silt curtains will contain turbidity from the loading operations. The third or outer barrier will define the work area. All loading will occur within the confines of the contained area in Mackinaw Bay.

A Digital Terrain Model (DTM) is developed using the Owner supplied survey data, to define the removal areas. The excavation is controlled using GPS positioning equipment, which allows the operator to see where the bucket is, relative to the DTM. This will minimize over excavation past the authorized limits as shown in the cross sections provided by the Owner. Upon completion of excavation as well as backfill operations, GPS survey equipment is used to verify material has been removed/replaced to the specified lines and grades. Additionally, the excavator is equipped with Dredgepak excavation hardware and software. This system accounts for pitch and roll of the support vessel thus maintaining accuracy of position.

Generally, all vessels will be moored at Mackinaw bay overnight. There is a possibility that due to weather, some equipment may need to be left at City Beach overnight. If this happens, the equipment will be secured and marked with flashing beacons.

5.0 SEDIMENT TRANSFER

Two barges, each containing two containers will transport material from the Mackinaw Bay to City Beach loaded, and back again empty. Prior to the approach of the container barge, a second boat will be required to remove two containments, allow for access, and then close the outer and secondary barriers behind the container barge. Once the empty containers are positioned between the first and secondary containment, loading operations can begin.

Operations will be scheduled to start early (6:00 AM) in order to complete the shift as early in the day as possible to avoid conflicts with the boating and beach accessing public to the extent practical. Envirocon anticipates working 10 hour shifts which will complete work daily by 4:30 PM. Round trip cycle times for transport barges is approximately 3 hours. The haul route will be a straight line from City Beach to Mackinaw Bay.

All containers will be lined with 6 mil poly plastic. The doors on the containers will be inspected to confirm that the door latches are secure. Once the containers are loaded, a visual inspection will confirm that the load is stable and that there is no potential for material spillage from the container to the barge deck or barge deck to the lake. The containers are large enough to hold 30 yards, however due to the weight of the sediments, only approximately 6 yards will be placed in each container. The minimal volume in each container will allow for sufficient free-board, and spillage protection.

During transport of loaded barges, the containers will be monitored for water leaks. The debris removal process of the operation will prevent materials such as larger rocks, trees, or metal from damaging the liners. Additionally the loading process will minimize the height that the mechanical dredge bucket drops sediment into the container, to prevent damage to the liner.

6.0 CITY BEACH OFF-LOADING

The barge will be pushed back to the City Beach access. Upon arrival at City Beach, a crane will be staged to unload the containers. The unloading area constructed at City Beach will allow a crane to pick the roll-off containers from the barge and place the containers directly on the transport truck. The initial loaded container will be placed directly on the truck. The second container will be placed on the boat ramp, and then lifted onto the truck when the transport returns. The full containers will be off-loaded and empty containers will be placed back onto the barge.

7.0 ENVIRONMENT IMPACTS

The Environment Protection Plan maintains plans for the protection of the environment. This Plan is a separate submitted document that includes a narrative description of plans and procedures for protecting the environment in regards to surface runoff into the Whitefish Lake, preventing release of diesel-range organics (DRO) into water or soils, turbidity monitoring, and contingency plans for handling spills when fueling or maintaining equipment.

Envirocon will utilize floating turbidity barriers in accordance with Section 02483, Part 2, 2.01 that are constructed of varying lengths and adequate depths to contain turbidity during removal, and have a positive connection system between panels. During mechanical dredging or debris removal the potential for sediment disruption exists. These activities will occur within areas protected by floating turbidity curtains with an oil boom strung along the interior of the turbidity curtain.

Envirocon will utilize 5" oil-only absorbent booms that are floating style booms that will not sink when saturated with oil. The booms will have mesh outer casings with sock filled interiors that will not shed, locking and overlapping connections, and a continuous rope reinforced center that runs the length of the boom. Additionally 19" sweeps will be used in the immediate area of the dredging, attached to the 5" booms, to minimize the potential for oil sheens to drift under the 5" booms.

8.0 EQUIPMENT

Envirocon plans to use the following equipment to complete the work:

- Excavator CAT320 equipped with a rotating mechanism and GPS;
- Roll-off trucks w/ containers;
- Shore-based 65 ton cranes;
- Work barges for transporting material and fuel;
- Support boats;

- Tugboats for maneuvering barges;
- Mechanic Truck; and
- Lube Truck

9.0 PUBLIC INTERACTION

The work areas associated with this project are not within any confines of a controlled site. These areas include City Beach and the lake itself. The MB project offers challenges in security and public interaction due to lack of controlled areas and public curiosity of site activities. Security of the beach will be achieved by proper access and control around the site. This control will be placed in the form of signage or fencing as necessary in order to limit public traffic, whether on foot or in a vehicle. This will include, as mentioned in Mobilization, security fence delineating the South boat ramp from the North. Operations will occur at the South ramp, closed to the public. The loop road will also be closed to the public. Appropriate traffic controls such as reflective barricades, candles, and signage will be required to protect and delineate the public from the operations.

Access to the immediate work area at the beach will be monitored by designated Envirocon employees. Contacts have been made with the manager of City Beach and the Parks Department. Employees of the City Beach manager will assist as necessary in public security. The aspect of Saturday work will be closely evaluated, due to the likely increase of public interaction.

Often equipment left unsecured can be vandalized or taken for “joy rides.” Envirocon will limit unnecessary equipment on the beach in the evenings. The intent is only to maintain minimal equipment on site in the evenings. This equipment will include the crane in a secure area, and possibly a barge and boat. Keys will not be left in machinery or boats. Fire extinguishers will be properly secured. Situations attracting the curiosity of children during shift or after will be minimized. Small equipment such as tools, pumps, generators, etc. will be chained, placed in equipment, or taken to the Railyard.

Interaction with the public out on the lake will be closely monitored. Employees will be instructed to conduct themselves in a professional manner, work with the boating public to answer questions, help limit curiosity of the public, and monitor the boating public to maintain appropriate distances from the operations. The outer boom within Mackinaw Bay will be equipped with buoys and lights for protection of the boating public.