17 May 2006

Mr. Bruce Sheppard
Manager Environmental Remediation
BNSF Railway Company
2454 Occidental Avenue South, Suite 1A
Seattle, Washington 98134

Subject: Wishram, Washington Groundwater Remediation
BNSF Railway Company
K/J 036026.02

Dear Mr. Sheppard:

This letter provides a summary of soil excavation activities conducted in 2005 and a description of remediation activities proposed for groundwater at the BNSF Railway Company (BNSF) railyard in Wishram, Washington (site).

## 2005 Excavation Summary

Between 24 October and 10 November 2005, NRC Environmental Services, Inc. (NRC) excavated approximately 3,000 tons of petroleum-containing soil and debris from the site and disposed of the material at the Regional Disposal Company landfill in Roosevelt, Washington. Excavation areas were selected based on previous site assessment results and observations made during excavation activities (see attached Figure C1).

NRC also completed the following:

- 400 pounds of asbestos-containing materials were excavated and disposed of at the Regional Disposal Company landfill.
- Approximately 1,000 gallons of lubricating oil [from an underground storage tank (UST)] and 200 gallons of diesel (from piping) were removed using a vacuum truck and properly disposed of at a recycling facility in Portland, Oregon.
- Approximately 10 tons of abandoned piping and one 5,000-gallon UST were removed, cleaned, and transported to a metals recycler in Portland, Oregon.
- Approximately 300 tons of steel-reinforced concrete (former fueling island and powerhouse foundation) were removed and disposed of at the Roosevelt landfill or used as backfill.
- Four-hundred pounds of oxygen release compound (ORC) were spread in the bottom of open excavations prior to backfilling.

- Backfilled areas and portions of site roadways were graded to approximate surrounding conditions then covered with a 3- to 6-inch-thick layer of gravel.
- An open-ended 12-inch-diameter sewer pipe encountered in the excavation area west of the maintenance-of-way (MOW) building was capped with a rubber boot and ring clamp.

Kennedy/Jenks Consultants collected confirmation soil samples from the locations shown on Figure C1, with the majority of sample data indicating petroleum hydrocarbon concentrations below Washington State Department of Ecology Model Toxics Control Act (MTCA) Method A Cleanup Levels for soil (data to be provided under separate cover). However, some results indicate the presence of residual hydrocarbons in the saturated zone west of the MOW building and, potentially, in the location of the former powerhouse. A small mass of soil (estimated to be less than 10 tons) with elevated hydrocarbons was left onsite beneath a power pole (north of the former powerhouse), which could not be disturbed.

## Groundwater Remediation Using Chemical Oxidation

The method proposed for addressing residual hydrocarbon concentrations in groundwater west of the MOW building and in the location of the former powerhouse is chemical oxidation via ozone injection. An evaluation of potential remediation methods for the site suggests that this would be a cost-effective and relatively rapid technique (2 to 4 months) for achieving cleanup to below MTCA Method A Cleanup Levels for groundwater. In each area, four direct-push well-points would be installed (Figure C1), and ozone, delivered from a programmable ozone generator, would be injected into groundwater through each well-point via underground tubing. Injection would be continued in each area for approximately two to four months. Remediation monitoring would be conducted using two new piezometers and existing monitoring wells.

## Implementation

It is assumed that Kennedy/Jenks Consultants would contract directly for the following services and materials:

- Construction of ozone injection points and piezometers using direct-push techniques
- Trenching and piping installation
- Installation of electrical service
- Leasing, mobilization/demobilization, and installation of an ozone generator
- Operation and maintenance.

## Reporting

When groundwater monitoring results indicate petroleum hydrocarbon concentrations in groundwater are below MTCA Method A cleanup levels, Kennedy/Jenks Consultants will prepare and submit to BNSF one construction documentation report including an evaluation of groundwater monitoring results.

## Estimated Costs

The estimated cost for designing and installing the injection system (in two areas, in succession) is approximately $85,000. The estimated cost for monthly operation and maintenance of the system and groundwater monitoring is approximately $7,000.

If you have any questions regarding the approach proposed above, please call us at (253) 874-0555. Thank you.

Very truly yours,

KENNEDY/JENKS CONSULTANTS

Galen C. Davis
Geologist

Ty C. Schreiner
Vice President

Attachment