

2 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES

The remedial action objectives were developed to address the potential Site risk to human health and the environment as noted in the BLRA.

2.1 Summary of Baseline Risk Assessment

The BLRA evaluated soil, groundwater, surface water, and sediment data against appropriate screening levels identified in the Multi-Site Risk Assessment Framework (RAF, Exponent, 2007). (See RI Report, June 2008, Appendix G) The results of the BLRA are summarized in the following sections:

2.1.1 Human Health Receptors

The BLRA evaluated the current and potential future land uses at the Site. The upland portion of the Site is recreational, consisting of Pfiffner Pioneer Park, band shell area, and museum. Under future land use conditions, Pfiffner Pioneer Park is not expected to change from conservancy zoning (Section 1.2.1).

The human health risk assessment (HHRA) included an initial screening-level assessment that considered two generic land use scenarios (i.e., residential and industrial/commercial use). Based on present and future land use, the following receptors and pathways were considered:

- **Industrial/Commercial Land Use - Worker:** through incidental ingestion, dermal contact, and inhalation of soils (as a result of soil disturbance). Dermal exposure and ingestion of groundwater is not expected due to the depth to groundwater (ranging from 6 to 13 feet below ground surface (bgs) – below depths encountered for landscaping activities) and public water supply.
- **Industrial/Commercial Land Use – Construction Worker:** through incidental ingestion, dermal contact, and inhalation of soils (as a result of soil disturbance) and groundwater via dermal contact and inhalation.
- **Recreational Land Use – Visitor:** through incidental ingestion and dermal contact with surface soil, incidental ingestion and dermal contact with surface water and sediment.
- **Residential Land Use** (the residential land use is a hypothetical future land use scenario for informational purposes): through surface incidental ingestion, dermal contact, and inhalation of with surface soil, subsurface soil, and groundwater.

2.1.2 Potential Human Health Risks

Results of the BLRA are summarized below:

- **Surface soil** does not pose a human health concern under the current land use and is at the low end of the target risk range for unrestricted use and unlimited access.
- **Subsurface soil** does not present a current human health exposure. Future residential and outdoor worker scenarios may present a risk based on residential and outdoor worker scenarios.
- **Groundwater** concentrations do not pose a current human health risk. A future risk to human receptors may occur if groundwater were to be used for drinking water purposes. Vapor intrusion is not expected to be a future risk if buildings are constructed over the affected groundwater in areas off the former MGP property.
- **Soil vapor** concentrations exceeding the residential exposure scenario for benzene in shallow soil samples at eight locations east of Water Street, two of which also exceed industrial/commercial exposure scenarios at 1×10^{-6} risk levels, are unrelated to MGP operations as discussed in Section 1.2.9.5.
- **Sediment** for human health exposure assessments is segregated by depth, considering the sediment in areas where the water depth is less than 3.5 feet. Sediment in areas where water is greater than 3.5 feet are considered too deep to be contacted by wading. The majority of the Wisconsin River is too deep to wade, except limited areas near shore. The entire pond is considered wadeable. No screening risk based concentrations (RBCs) have been established for sediments, so the sediment concentrations are compared to residential soil RBCs as an initial conservative comparison. However, the residential soil screening RBCs for PAH concentrations are based on exposures for 350 days per year over a 30-year duration. If sediment concentrations exceed these conservative RBCs, further evaluation is performed to semi-quantitatively evaluate the potential risk associated with the exposure.

In the case of the pond at Stevens Point, the cancer risk value was estimated at 5×10^{-6} (near the low end of the generally acceptable risk range of 1×10^{-4} to 1×10^{-6}) assuming occasional exposure to the maximum sediment concentration occurred once per year for 30 years, using the same assumptions of the residential soil RBCs. In addition, the number of days that an individual would contact pond sediments before exceeding the upper end of the generally acceptable risk range (1×10^{-4} to 1×10^{-6}) was calculated. This calculation indicated an individual could contact the sediment approximately 20 days/year over a 30-year period without exceeding a carcinogenic risk of 1×10^{-4} .

Additional discussion on the risk assessment for human health is included in Section 4.2.2.2. of the BLRA, provided in RI Report – Revision 1 (NRT, May 2011).

- **Wisconsin River Sediment** does not pose a human health concern based on the limited area where wading is possible (water depths less than 3.5 feet).
- **Pfiffner Pioneer Park Pond Sediments** do not present a human health risk under occasional exposure scenarios (5×10^{-6} if one day per year over a 30 year period or 1×10^{-4} if approximately 20 days per year over a 30 year period).

- **Wisconsin River and Pfiffner Pioneer Park Pond Surface Water** do not present a direct contact risk or an ingestion risk to human health based on the conservative screening of surface water concentrations to drinking water standards.

2.1.3 Ecological Receptors

The habitat assessment, performed on November 1, 2006, as part of the SSWP (see Appendix C of the SSWP), concluded the Site does not provide sufficient habitat for birds and small mammals in either the upland or aquatic portions of the Site. Thus, the ecological receptors are fish and benthic invertebrate.

2.1.4 Potential Ecological Risk

Results of the BLRA are summarized below:

- **Fish** are not at risk due to:
 - Spatial extent of affected sediment compared to the habitat required;
 - Mobility of fish; and
 - The primary contaminant being PAHs, which are readily metabolized by fish.
- **Benthic Invertebrates** in a localized area of the Wisconsin River and in Pfiffner Pioneer Park Pond are at risk due to bulk PAH concentrations.

As discussed in the Multi-Site Risk Assessment Framework (Exponent, September 2007), sediment sampling may be a one step or a two step approach. A one step sediment sampling approach was appropriate at Stevens Point (refer to the SSWP – Revision 1 (NRT, April 2007)) because previously collected sediment results compared to the sediment ecological benchmarks indicated the extent of MGP-affected sediment was generally localized to the area where the former slough discharged.

It should be noted because site-specific toxicity testing was not performed as part of the BLRA at Stevens Point, the BLRA relied on the hierarchy of sediment ecological benchmarks for sediment that were presented in USEPA's December 20, 2007 approval of the Multi-Site Risk Assessment Framework (Exponent, September 2007). A total PAH criterion is used for the sediment ecological benchmarks to account for the combined effects of the PAH mixture. The total PAH sediment benchmarks better represent the toxicity of the mixture of PAHs, which is known to cause narcotic effects on benthic invertebrates. The total PAH sediment benchmarks were developed based on the sum of the PAH concentrations for a specific list of 13 PAHs, (PAH-13, refer to the BLRA in the RI Report – Revision 1 (NRT, May 2011)). The sediment benchmarks are considered conservative and would be protective of PAHs in general, including alkylated PAHs that may not have been reported.

2.2 Applicable or Relevant and Appropriate Requirements (ARAR)

Section 121 of CERCLA requires, subject to specified exceptions, that remedial actions must be protective of human health and the environment. In addition, remedial actions performed under the Superfund program must be undertaken in compliance with both state and federal ARARs. ARARs are defined as:

Any cleanup standards, standard of control, environmental protection requirements, criterion, or limitation under any Federal or State environmental law that specifically addresses a hazardous substance, pollutant, contaminant, remedial action, or location.

Promulgated State Standards that are more stringent than the Federal Standards may be an ARAR. In addition to ARARs, the USEPA may identify other relevant information, criteria, or guidance to be considered (TBC). TBCs may not be legally binding or enforceable but may be useful in developing remedial alternatives. Both ARARs and TBCs may be chemical-specific, location-specific, or action-specific.

Chemical-specific ARARs are generally health or risk based standards that define concentration limits for environmental media or discharges. These requirements may be used to set cleanup levels for constituents of concern in environmental media.

Location-specific ARARs are based on the site's characteristics or location including natural site features such as wetlands, floodplains, and endangered or threatened species and habitats. Location-specific ARARs may also apply to man-made features such as cultural resource areas.

Action-specific ARARs are technology-based or activity-based limits that guide how the remedial action will be implemented or how remedial waste may be handled.

Table 1 summarizes preliminary federal and state ARARs and TBCs. The ARARs and TBCs may be modified until a Record of Decision (ROD) is issued and may be reexamined during the five-year review process.

2.3 Development of Preliminary Remedial Action Goals (PRG)

PRGs are long-term target goals used during analysis and evaluation of remedial alternatives. The PRGs comply with ARARs and result in protection of human health and the environment, as discussed in the BLRA.

2.3.1 PRGs for Soil

The PRG for soil is a target cancer risk of 1×10^{-4} for the hypothetical residential land use and outdoor commercial worker land use.

2.3.2 PRGs for Groundwater

The PRG for groundwater is the federal MCLs (USEPA 2008) or the WDNR's NR 140 (WDNR 2008) Groundwater Enforcement Standards (ES), if an MCL does not exist.

2.3.3 PRGs for Sediment

The PRG for sediment is to address the effects of oil-wetted/oil-coated sediment or total PAH-13 concentrations that exceed the ecological screening level (based on the probable effects level of 22.8 mg/kg) in the surface sediment (0 to 6 inches below top of sediment), if present.

2.4 Remedial Action Objectives

Remedial Action Objectives (RAO) for the Site were developed to protect human health and environmental receptors from unacceptable risk due to the MGP-residuals at the Site. These goals serve as the design basis for the remedial alternatives presented in Section 3 and evaluated in Section 4. The RAOs address current and reasonably anticipated future land use and potential beneficial groundwater use.

2.4.1 Protection of Human Health RAOs

- **RAO 1** – Minimize potential dermal contact, incidental ingestion, and inhalation (as a result of soil disturbance) of subsurface soil.
- **RAO 2** – Minimize potential dermal contact, ingestion, and inhalation (as a result of vapor intrusion) of groundwater and restore to the extent possible or demonstrate movement toward attaining the groundwater PRG within 30 years.

2.4.2 Protection of Ecological/Environment RAOs

- **RAO 3** – Maintain Wisconsin River benthic ecosystem.
- **RAO 4** – Maintain Pfiffner Pioneer Park Pond ecosystem.