

# East Mission Flats Repository Monitoring Activities

## Introduction

The East Mission Flats Repository (EMFR) is designed to be protective of ground water and surface water quality. Regular monitoring is done to evaluate the continued effectiveness of the design. This document describes the monitoring activities. All monitoring is done in accordance with the *Sampling and Analysis Plan (SAP)/ Quality Assurance Project Plan (QAPP) for Ground water and Surface Water Monitoring at the East Mission Flats Repository Revision No. 1* issued on October 29, 2010.

## Monitoring Network Description

The sampling network includes seven ground water monitoring wells, one pumping well, two piezometers, and two surface water level loggers. The loggers record periods of flood water inundation at the site.

Flood water samples were collected at the site in 2008 and again in 2011. During both years, samples were collected as flood water flowed into the area surrounding the repository and again as flood water flowed out of the area surrounding the repository. These samples confirm that the EMFR is in an area where sediment settles out of the flood waters as the waters recede. This type of area is called a 'depositional environment.'

Quarterly sampling is conducted at five ground water monitoring wells within the EMFR property boundary (Figure 1). Monitoring wells MW-A, MW-B, MW-C and MW-D monitor ground water conditions from 17 to 27 feet below the ground surface. Monitoring well MW-C-deep monitors ground water conditions from 75 to 95 feet below the ground surface. Each of these monitoring wells is located within 150 feet of the current and proposed waste soil boundary.

Ground water in the area generally flows toward the southwest. Monitoring wells MW-A and MW-D are located "upgradient" and provide samples of ground water flowing into the site. Monitoring wells MW-C, MW-C-deep, and MW-B are "downgradient" wells, and provide samples of ground water that has flowed beneath the EMFR property.

Quarterly ground water samples are collected from the pumping well that supplies the water used for decontamination of equipment leaving the EMFR. The decontamination well is sampled to evaluate the ground water directly below the repository (Figure 1). The well is 100 feet deep and monitors ground water conditions from 76 to 96 feet below the current repository surface.

Quarterly ground water sampling is also conducted at monitoring wells MW-E and MW-F located outside the property boundary (Figure 1). Sampling at these locations is intended to help build an understanding of the ground water conditions surrounding the area. Well MW-E is located about 2000 feet northwest of the repository and is about 25 feet deep. MW-E monitors ground water conditions from about 15 to 25 feet below the ground surface. Water levels are 5 to 10 feet higher in MW-E than at the other monitoring wells. This difference may indicate the presence of a separate body of ground water in this area. Monitoring well MW-F is a down-gradient well that is located about 900 feet southwest of the repository. This monitoring well is about 30 feet deep and monitors ground water conditions from 20 to 30 feet below the ground surface.

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In accordance with the *East Mission Flats Repository Enhanced Monitoring Plan* issued on November 23, 2009, two piezometers are installed directly into the waste soil mass to monitor for the presence of water (Figure 1). Piezometer PZ-A monitors conditions from about 0.5 to 2.5 feet above the bottom of the waste soil. Piezometer PZ-B measures conditions from about 6.5 to 8.5 feet above the bottom of the waste soil.

### Monitoring

The greatest potential for the mobilization of the constituents of concern found in the repository waste soils is through erosion and leaching processes. Visual inspections of the waste mass and ground water monitoring are the primary forms of monitoring used to evaluate the continued effectiveness of the repository design.

Erosion of the waste soils is monitored through weekly visual inspections. Visual inspection provides a straight forward assessment for any sign that soil is being mobilized from the repository. Although unlikely based on its current design and the depositional environment of the repository, if any signs of erosion are observed, actions would be taken to correct the problem.

Quarterly ground water monitoring helps ensure that there is no leaching of contaminants into ground water from the waste soil. Ground water monitoring began in 2007, before the repository was built, to help establish baseline water quality. Sampling is conducted at monitoring wells to evaluate ground water entering and exiting the property.

On site data collected during the quarterly monitoring includes water level, specific conductance, temperature, pH, dissolved oxygen, and oxidation reduction potential. The quarterly samples are further evaluated in the laboratory for total and dissolved antimony, arsenic, cadmium, lead, and zinc. In addition, samples are analyzed for dissolved calcium, magnesium, potassium, sodium, dissolved chloride, nitrate nitrogen, sulfate, total alkalinity, total hardness as calcium carbonate and total phosphorus. When appropriate, statistical evaluation of the data according to *Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities; Unified Guidance*, published by EPA in 2009 will be performed to evaluate the continued effectiveness of the repository design.

In accordance with the *Enhanced Monitoring Plan*, when water is present, the piezometers are outfitted to record water levels, pH, specific conductance, oxidation reduction potential, water temperature, and dissolved oxygen. The piezometers monitor conditions within the waste soil mass.

The sampling plan at this repository is designed to provide a comprehensive detection monitoring network. The quarterly ground water monitoring provides continued vigilance to ensure that contaminants do not leave the site or contaminate ground water.



Figure 1: East Mission Flats Repository Monitoring Points, Cataldo Idaho