Five-Year Review Report

First Five-Year Review Report
for
Eastern Michaud Flats Superfund Site
IDD984666610

Pocatello
Power County and Bannock County, Idaho

September 2015

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Region 10
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First Five-Year Review Report
for
Eastern Michaud Flats
Pocatello
Power County and Bannock County, Idaho and Fort Hall Indian Reservation

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List of Acronyms

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
AWQC	Ambient Water Quality Criteria
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CIC	Community Involvement Coordinator
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DAPL	Dense Aqueous Phase Liquid
EPA	United States Environmental Protection Agency
FMC	FMC Corporation
FS	Feasibility Study
FYR	Five-Year Review
HQ	Hazard Quotient
IC	Institutional Control
IDEQ	Idaho Department of Environmental Quality
IRODA	Interim ROD Amendment
lbs/day	Pounds Per Day
MCL	Maximum Contaminant Level
mg/kg	Milligrams Per Kilogram
mg/L	Milligrams Per Liter
mrem/yr	Millirems Per Year
NA	Not Applicable
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PAP	Phosphoric Acid Plant
pCi/g	Picocuries Per Gram
pCi/L	Picocuries Per Liter
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
TBC	To-Be-Considered
TBD	To-Be-Determined
TMDL	Total Maximum Daily Load
TSP	Total Suspended Particulate
UAO	Unilateral Administrative Order
UCL	Upper Confidence Limit

Executive Summary

The 2,530-acre Eastern Michaud Flats Superfund site (the Site) is located approximately 2.5 miles northwest of the City of Pocatello in Power and Bannock Counties in southeast Idaho. Portions of the Site are located within the boundaries of the Fort Hall Indian Reservation. The Site is divided into three operable units (OUs): OU1 (FMC OU), OU2 (Simplot OU) and OU3 (Off-Plant OU). The FMC and Simplot OUs include two adjacent phosphate-ore processing facilities: the former FMC Corporation (FMC) Elemental Phosphorous Plant and the active J.R. Simplot Company Don Plant (Simplot). The Site encompasses the areal extent of contamination at and from both plants, including the Off-Plant OU for portions beyond the FMC and Simplot plant boundaries. A site-wide Record of Decision (ROD) was issued in 1998 with Interim ROD amendments (IRODAs) signed in 2010 for the Simplot OU and 2012 for the FMC OU.

The FMC OU interim remedy in the 2012 IRODA, which replaces the 1998 ROD remedy for the FMC OU, addresses metals, radionuclides and other contaminants of concern (COCs) identified in soils, fill and groundwater at the FMC OU. The remedy calls for evapotranspiration caps, soil covers and limited excavation to remediate source areas. A groundwater extraction/treatment system is required and is being designed to contain and treat contaminated groundwater. Institutional controls are required to prohibit activities that may disturb remedies and restrict the use of contaminated groundwater. The remedial action will include development and implementation of an operation, maintenance and monitoring plan for both the soil and groundwater interim remedies. Remedial action construction in the FMC OU began in September 2014 and is not yet complete.

The Simplot OU remedy which is outlined in both the 1998 ROD and 2010 IRODA addresses metals, radionuclides and other COCs identified in soils, fill and groundwater at the Simplot OU. This includes development, operation and maintenance of the groundwater extraction system; excavation of contaminated soils; and use of institutional controls to prevent the use of contaminated groundwater for drinking purposes, control potential worker exposures and prevent potential future residential use of the Simplot property. In addition to the above, the interim remedy addresses phosphorus as a COC and includes enhancement of the groundwater extraction system; installation of a synthetic liner on the receiving surface of the gypsum stack; and control of the sources of phosphorus and other COC releases from the Simplot OU. Remedial action construction in the Simplot OU began in 2002 and is not yet complete.

The Off-Plant OU remedy in the 1998 ROD includes institutional controls and additional monitoring to determine if further source control or other actions are necessary. While some environmental monitoring has taken place, additional evaluation is necessary to determine the extent of required institutional controls, source control measures or other actions.

The triggering action for this first statutory five-year review (FYR) is the on-site construction start date for the augmentation of the groundwater extraction system at the Simplot OU, June 28, 2010.

The interim remedy at FMC OU (OU1) is not protective because ecological exposure pathways that could result in unacceptable risks are not under control. Source control measures must be implemented and the groundwater extraction and treatment system operated until the phosphorus risk-based concentration determined to be protective of ecological receptors in surface water is met. Remedial actions currently being implemented are adequately controlling all human health exposure pathways that could result in unacceptable risks. Remedy design and construction are

ongoing, an interim groundwater monitoring plan and a dust control and air monitoring plan are in place, access to the site is controlled, and there are currently no known wells used for human consumption of groundwater within the contaminated groundwater plume.

The remedy at Simplot OU (OU2) is not protective because ecological exposure pathways that could result in unacceptable risks are not under control. Source control measures and groundwater extraction must be operated until the phosphorus risk based concentration determined to be protective of ecological receptors in surface water is met. The groundwater extraction system is operating and source controls measures are being implemented on the gypstack and in the Phosphoric Acid Plant Area, but levels protective of ecological receptors in surface water have not been achieved. Remedial actions currently being implemented are adequately controlling all human health exposure pathways that could result in unacceptable risks. There are no known wells used for human consumption in the contaminated groundwater plume, a groundwater monitoring plan is in place and site access is controlled.

A protectiveness determination of the remedy at the Off-Plant OU (OU3) cannot be made at this time until further evaluation of available information is conducted. Additional evaluation is needed to delineate the areas where the institutional controls to address human health risks from cadmium and radium contamination in soils may need to be implemented and to determine if additional actions, including source control measures, are needed to address ecological risks from fluoride contamination.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Eastern Michaud Flats		
EPA ID: IDD984666610		
Region: 10	**State:** ID	**City/County:** Pocatello/Power County and Bannock County

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** No

REVIEW STATUS
Lead agency: EPA **If "Other Federal Agency" selected above, enter Agency name:** Click here to enter text.
Author name: Jannine Jennings and Jonathan Williams with support from Skeo Solutions
Author affiliation: EPA and Skeo Solutions
Review period: 12/11/2014 – 9/30/2015
Date of site inspection: March 11 – 12, 2015
Type of review: Statutory
Review number: 1
Triggering action date: 6/28/2010
Due date *(five years after triggering action date)*: 6/28/2015

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU1

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 2 (Simplot OU)	Issue Category: Remedy Performance			
	Issue: Contaminated groundwater plume in PAP Area is not contained.			
	Recommendation: Develop a plan to remove low pH groundwater and re-establish groundwater containment.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	PRP	EPA	6/30/2016

OU(s): 3 (Off-Plant OU)	Issue Category: Remedy Performance			
	Issue: Areas in Off-Plant OU where risks exceed protective levels defined by the 1998 ROD require institutional controls or other actions. These areas have not been defined and remedial actions have not been implemented.			
	Recommendation: Define the specific areas where institutional controls or other actions are required.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	EPA	EPA	6/30/2016

OU(s): 3 (Off-Plant OU)	Issue Category: Remedy Performance			
	Issue: Areas in Off-Plant OU where risks exceed protective levels defined by the 1998 ROD require institutional controls or other actions. These areas have not been defined and remedial actions have not been implemented.			
	Recommendation: Implement the required measures if necessary.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	PRP	EPA	6/30/2017

Five-Year Review Summary Form (continued)

Protectiveness Statements

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
1 FMC OU	Not Protective	Click here to enter date.

Protectiveness Statement:

The interim remedy at FMC OU (OU1) is not protective because ecological exposure pathways that could result in unacceptable risks are not under control. Source control measures must be implemented and the groundwater extraction and treatment system operated until the phosphorus risk-based concentration determined to be protective of ecological receptors in surface water is met. Remedial actions currently being implemented are adequately controlling all human health exposure pathways that could result in unacceptable risks. Remedy design and construction are ongoing, an interim groundwater monitoring plan and a dust control and air monitoring plan are in place, access to the site is controlled, and there are currently no known wells used for human consumption of groundwater within the contaminated groundwater plume.

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
2 Simplot OU	Not Protective	Click here to enter date.

Protectiveness Statement:

The remedy at Simplot OU (OU2) is not protective because ecological exposure pathways that could result in unacceptable risks are not under control. Source control measures and groundwater extraction must be operated until the phosphorus risk based concentration determined to be protective of ecological receptors in surface water is met. The groundwater extraction system is operating and source controls are being implemented on the gypstack and in the Phosphoric Acid Plant Area, but levels protective of ecological receptors in surface water have not been achieved. Remedial actions currently being implemented are adequately controlling all human health exposure pathways that could result in unacceptable risks. There are no known wells used for human consumption in the contaminated groundwater plume, a groundwater monitoring plan is in place and site access is controlled.

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
3 Off-Plant OU	Protectiveness Deferred	3/30/2016

Protectiveness Statement:

A protectiveness determination of the remedy at the Off-Plant OU (OU3) cannot be made at this time until further evaluation of available information is conducted. Additional evaluation is needed to delineate the areas where the institutional controls to address human health risks from cadmium and radium contamination in soils may need to be implemented and to determine if additional actions, including source control measures, are needed to address ecological risks from fluoride contamination.

First Five-Year Review Report
for
Eastern Michaud Flats Superfund Site

1.0 Introduction

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is or will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

The triggering action for this first statutory FYR is the on-site construction start date for the augmentation of the groundwater extraction system at the Simplot OU, June 28, 2010. The FYR is required due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Eastern Michaud Flats Superfund site (the Site) consists of three operable units (OUs). Portions of the Site are located within the boundaries of the Fort Hall Indian Reservation. EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP)-financed cleanup at the Site. This FYR report is the first FYR for the Site and addresses all site OUs.

EPA conducted the FYR between December 2014 and July 2015 at the Site in Pocatello, Power and Bannock Counties, Idaho. Skeo Solutions, an EPA Region 10 contractor, provided support

for drafting this FYR. Idaho Department of Environmental Quality (IDEQ) and the Shoshone Bannock Tribes Environmental Waste Management Program, as the support agencies representing the State of Idaho and the Shoshone Bannock Tribes, have had an opportunity to comment on a draft of this report and provided input to EPA during the FYR process.

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
J.R Simplot Company (Simplot) and FMC Corporation (FMC) began operating phosphorous plants near Pocatello, ID	1940s
Idaho Department of Health and Welfare detected groundwater contamination at the Site	1976
Simplot excavated Former East Overflow Pond	1987
EPA proposed the Site for listing on National Priorities List (NPL)	May 5, 1989
EPA placed the Site on NPL	August 30, 1990
EPA issued an Administrative Order on Consent (AOC) to FMC and Simplot, requiring a remedial investigation/feasibility study (RI/FS)	May 30, 1991
FMC and Simplot completed an RI for the Site	1996
FMC and Simplot completed an FS for the Site	1997
EPA issued a site-wide Record of Decision (ROD)	June 8, 1998
FMC entered into a Resource Conservation and Recovery Act (RCRA) Consent Decree for Hazardous Waste/Regulated Activities	1998
FMC closed their elemental phosphorous plant	December 2001
Simplot entered into a Consent Decree for remedial actions at the Simplot OU	May 9, 2002
EPA withdrew proposed RD/RA Consent Decrees with FMC and Simplot that had been Lodged in Federal District Court	2002
Dewatering Pit RA implemented at Simplot OU	April/May 2003
EPA and FMC entered into an AOC for a supplemental RI/FS of FMC	October 16, 2003
Simplot implemented Gypsum Stack Roads RA	September/October 2004
EPA approved a supplemental RI Work Plan for the FMC OU	May 2007
EPA approved FMC's Final Design Analysis Report for Pond 16 S removal action and gas extraction treatment system	February 2008
Simplot and DEQ signed a Voluntary Consent Order/Compliance Agreement to implement actions needed to reduce phosphorus in river	April 11, 2008
FMC completed the FMC OU supplemental RI report	2009
Simplot starts construction of Decant Pond as first phase of the Gypstack Lining Project	2009
EPA finalized Supplemental RI Addendum Report for FMC OU and issued an interim ROD amendment for Simplot OU	January 20, 2010
Unilateral Administrative Order (UAO) issued to FMC for phosphine gas at additional closed RCRA ponds	June 14, 2010
Start of RA Construction/Simplot Groundwater Extraction System	June 28, 2010
FMC completed supplemental RI/FS	July 2010
EPA issued Ready for Reuse Determinations for three parcels in the FMC OU	October 2010
Remedial design/remedial action Consent Decree amended for Simplot OU	December 2010
Simplot and FMC prepare supplemental assessments of potential risks at Off-Plant OU	2010

Event	Date
EPA samples fluoride in soils and vegetation in the Bottoms Area of Off-Plant OU	June – September, 2011
EPA released plan for interim ROD amendment for FMC OU	September 26, 2011
Remedial Action completion for groundwater extraction and monitoring elements at Simplot OU	July 2, 2012
EPA issued an interim ROD amendment for FMC OU	September 27, 2012
EPA issued the UAO for FMC to perform the selected interim remedial action	June 10, 2013
EPA approved the FMC OU Grading Phase Component of Remedial Action Work Plan	September 5, 2014

3.0 Background

3.1 Physical Characteristics

The Site is about 2.5 miles northwest of the City of Pocatello in Power and Bannock Counties in southeast Idaho (Figures 1 and 2). Portions of the Site are located within the boundaries of the Fort Hall Indian Reservation. Land use around the Site includes agriculture and grazing as well as residential and light industrial/commercial uses. The Portneuf River flows across the northern edge of the Site, through the Bottoms Area (a large wetland of cultural significance to the Tribes) and to the American Falls Reservoir.

The Site is divided into three OUs: OU1 (FMC OU), OU2 (Simplot OU) and OU3 (Off-Plant OU). The FMC and Simplot OUs include two adjacent phosphate-ore processing facilities: the former FMC Elemental Phosphorous Plant and the active J.R. Simplot Company (Simplot) Don Plant. The Site encompasses the extent of contamination at, and originating from, both plants, including the Off-Plant OU for areas beyond the FMC and Simplot Don Plant properties.

The FMC OU is approximately 1,450 acres and is largely located within the boundaries of the Fort Hall Indian Reservation. The FMC elemental phosphorous production plant was closed in December of 2001, and the plant infrastructure was decommissioned from 2002 through 2006. The dominant physical features remaining at the site are the slag pile, and several capped waste ponds. The Portneuf River flows adjacent to the northeastern boundary of the FMC OU. The FMC OU consists of four areas: the Former Operations Area, the Northern Properties, the Southern Undeveloped Area and the Western Undeveloped Area.

The Simplot OU is approximately 1,025 acres. Simplot's main plant area is directly east of the FMC OU and is located to the south of the Union Pacific Railroad tracks that run parallel to Highway 30 and Interstate 86. The Portneuf River flows adjacent to the northern boundary of the Simplot OU. The dominant physical feature is the gypsum stack (gypstack), a stack of manufacturing byproduct over 240 feet tall. Several ponds used to store wastewater and stormwater from the plant are located north of the railroad tracks. Activities associated with ongoing operations are typically regulated under separate State and/or Federal regulatory authorities.

The Off-Plant OU is defined as all land surrounding the FMC and Simplot plants with contamination originating from the plants. Land uses in this area include agriculture and grazing as well as residential and light industrial/commercial uses.

The Site is at the base of the northern slope of the Bannock Range and extends onto the southeastern area of the Michaud Flats. The Michaud Flats are on the Eastern Snake River Plain and are bounded on the north by American Falls Reservoir, on the east by the Portneuf River, on the west by the Rock Creek, and on the south by foothills of the Deep Creek Mountains and Bannock Range.

The Site sits on discontinuous layers of unconsolidated sediments deposited on volcanic bedrock. The sediments include gravel from volcanic rocks, fine-grained silts, clays and sands, quartzite, chert, cobbles, boulders, windblown silt (loess) and colluvial silt.

Shallow groundwater beneath the FMC and Simplot OUs generally flows north towards the Portneuf River. North of the railroad tracks the shallow groundwater from both OUs mix with upwelling groundwater, and discharges to the Portneuf River near Batiste Springs. The aquifer system underlying the Michaud Flats area can be divided into a shallow aquifer (Upper Zone) and a deeper aquifer (Lower Zone). In the plant areas, the Upper and Lower Zones are generally separated by the American Falls Lake Bed Clay. North of Highway 30, the American Falls Lake Bed Clay pinches out and the Upper and Lower Zones merge. The Upper Zone consists of Michaud Gravel and is typically overlain by a silt aquitard. The hydraulic conductivity of the shallow aquifer ranges from 30 to 1,000 feet per day. The deeper aquifer is the primary water-producing aquifer and has a hydraulic conductivity ranging from 30 to 340 feet per day.

3.2 Land and Resource Use

The FMC elemental phosphorous plant began operations in 1949, processing phosphate ore and manufacturing elemental phosphorous until operations ceased in December 2001. Previously, the land was in agricultural use. From 2002 through 2006, the FMC elemental phosphorous plant was decommissioned and facilities were demolished. There are three parcels (totaling about 87 acres) in the FMC OU that have Ready for Reuse Determinations, which have been restricted to commercial and industrial uses only by a recorded restrictive covenant (see Section 6.3 of this FYR for further discussion of institutional controls).

The FMC Former Operations Area includes the CERCLA Ponds, where process wastes were managed in unlined surfaced impoundments; the slag pile, where most of the above-grade slag byproduct sits, and which includes the site of a historic landfill and buried railcars; the capped and vegetated Calciner Ponds; and the former elemental phosphorous area. The Resource Conservation and Recovery Act (RCRA) ponds, where process wastes were managed and have since been capped under RCRA and which are fenced off, are also within the boundaries of the Former Operations Area but, as specified in the 2012 FMC IRODA, are not part of FMC OU.

The Simplot Don Plant began operations in 1944 and continues to operate an ore processing facility and byproduct/waste storage facility on the Simplot OU. The byproduct gypsum is slurried with water before it is added to the gypstack, located south of the main plant. As the gypsum dries, process water percolates down through the gypstack and into the groundwater. Incidental releases within the main plant operating area have also contributed to contaminants of concern (COCs) in groundwater.

The Union Pacific Railroad, Highway 30 and U.S. Interstate-86 run east-west through the northern portion of the Site. Most of the land south of the two plant areas is either managed by the Bureau of Land Management for multiple use or held in Trust for the Shoshone Bannock Tribes. Other nearby lands are primarily used for agriculture with some residential and light commercial use. The nearest residence is within a half mile north of the FMC and Simplot properties, north of Highway 30 and I-86.

Impacted groundwater beneath the Site discharges to the Portneuf River as underflow through the river bed and to a number of springs along the bank of the river. Groundwater from the deeper aquifer underlying the Site is extracted for agricultural, industrial and domestic uses downgradient from the Site. The Portneuf River flows into American Falls Reservoir, both of which are used for recreation and fishing. The Bottoms Area, a large wetland area located approximately 3 miles downgradient of the Site, is used by the Shoshone-Bannock Tribes for many uses including traditional and ceremonial activities.

Projected land uses in the area are expected to remain relatively unchanged. However, some of the agricultural land may be developed into residential areas and FMC is considering various reuses for properties at the FMC OU near U.S. Highway 30 and the Union Pacific RR line. These future uses will remain commercial or light industrial.

3.3 History of Contamination

The Site's contamination was caused by ore processing and waste disposal at the Site beginning in the 1940's.

The Idaho Department of Health and Welfare conducted a groundwater monitoring study downgradient from the plants in 1976 and discovered levels of arsenic, lead and cadmium above federal drinking water standards. In 1977, the U.S. Geologic Survey, in preparing an environmental impact statement related to the development of phosphate resources in southeast Idaho, detected elevated levels of phosphate in Batiste Springs. They attributed the phosphorus to sources at the Site. Additional sampling and studies have found high levels of phosphorus, mercury, arsenic and cadmium in Batiste Springs. In 1987, an EPA inspection of both plants found that groundwater contained metals at concentrations exceeding maximum contaminant levels (MCLs). EPA also found elevated levels of cadmium, chloride, total chromium, copper, fluoride and selenium in pond, waste and soil samples.

In 1999, the Idaho Department of Environmental Quality (IDEQ) prepared a Water Body Assessment and a TMDL (Total Maximum Daily Load) for phosphorus for the Portneuf River. The TMDL concluded that the springs north of source areas of the EMF Site were responsible for the largest mass loading of phosphorus to the Portneuf River, approximately 75 to 80% of all loading. In 2003, the Portneuf River Implementation Plan identified mass reduction goals for identified sources, including an approximate 95% reduction from EMF Site sources. The remedies in the FMC and Simplot IRODAs include remedial actions expected to result in the attainment of the load reductions identified in the TMDL.

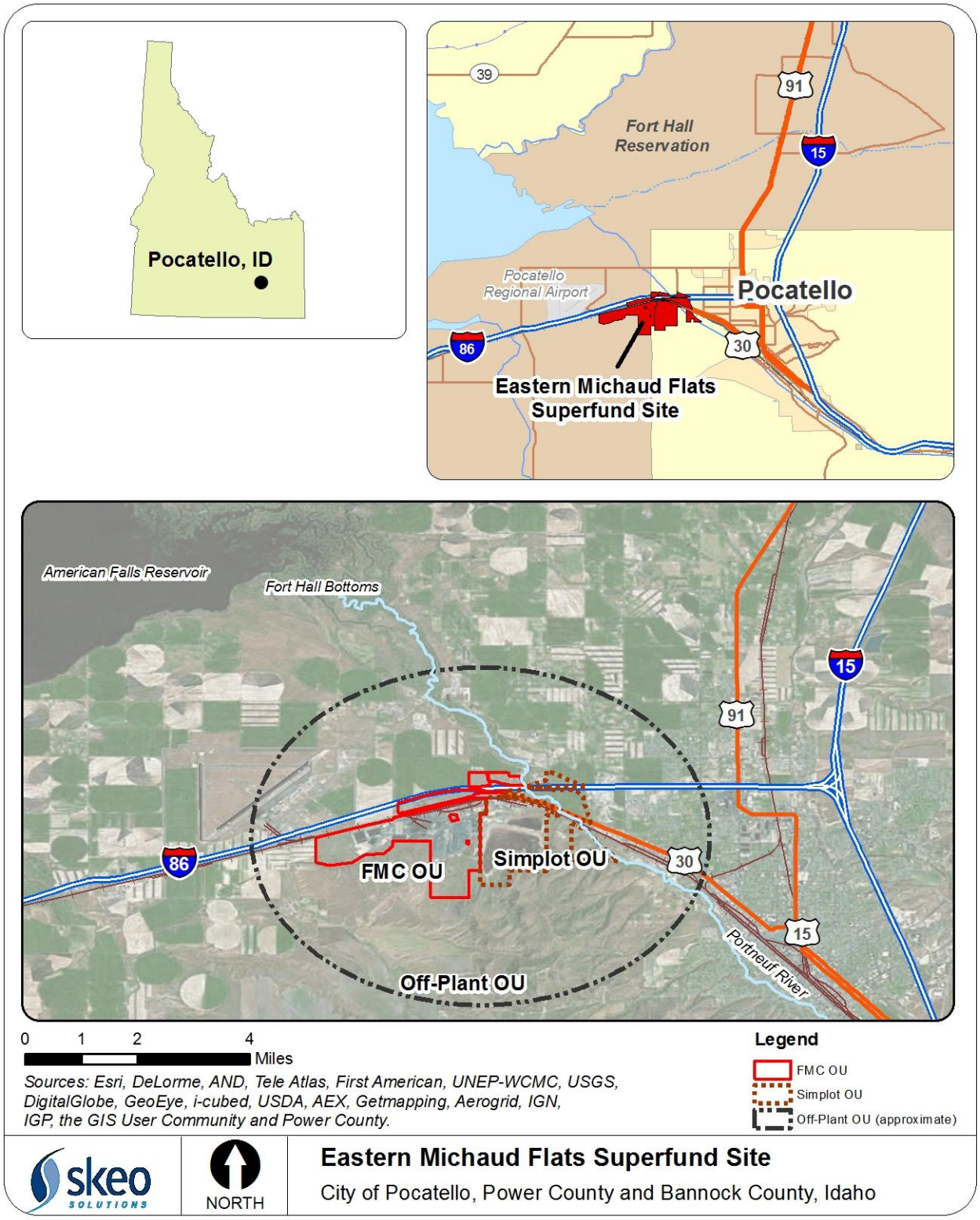
At FMC, phosphate ore historically arrived by rail. The ore was formed into briquettes, calcined and blended with coke and silica to make phosphorus furnace feed. FMC used four furnaces to yield gaseous elemental phosphorous as well as byproducts such as slag and ferrophos and waste such as dust, solids and phossy solids. FMC used slag, which is a source of gamma radiation, and other waste material as fill to grade its property and expand its operations area. The current conceptual model, based on available information indicates that the molten elemental phosphorous also leaked from the furnace building into the soil and formed a now-solid plume beneath the Former FMC Elemental Phosphorus Production Area. The nature and extent of solidified phosphorous has not been well defined because of the risk posed to workers when recovering drill cuttings with elemental phosphorus in them. Depending upon the time frame, the aqueous streams, such as phossy water/solids, precipitator slurry, calciner water/solids and industrial wastewater, were managed in unlined or lined surface impoundments, some of which were subject to regulation under RCRA.

Historically the Simplot Don Plant also received phosphate ore by rail but the ore is now slurried at the mine and transported to the plant by pipeline. At the Don Plant, the slurry is reacted with sulfuric acid to produce phosphoric acid and byproduct gypsum (calcium sulfate). The phosphoric acid is used to make various grades of fertilizer while the gypsum byproduct is slurried with water and transported to the gypsum stack south of the main plant.

The gypstack was originally constructed on bare ground and did not include any barrier between the waste and the groundwater, thus allowing low pH process water to percolate down through the gypstack to groundwater. There have also been incidental releases throughout the main plant operating area that have contributed to COCs in the groundwater.

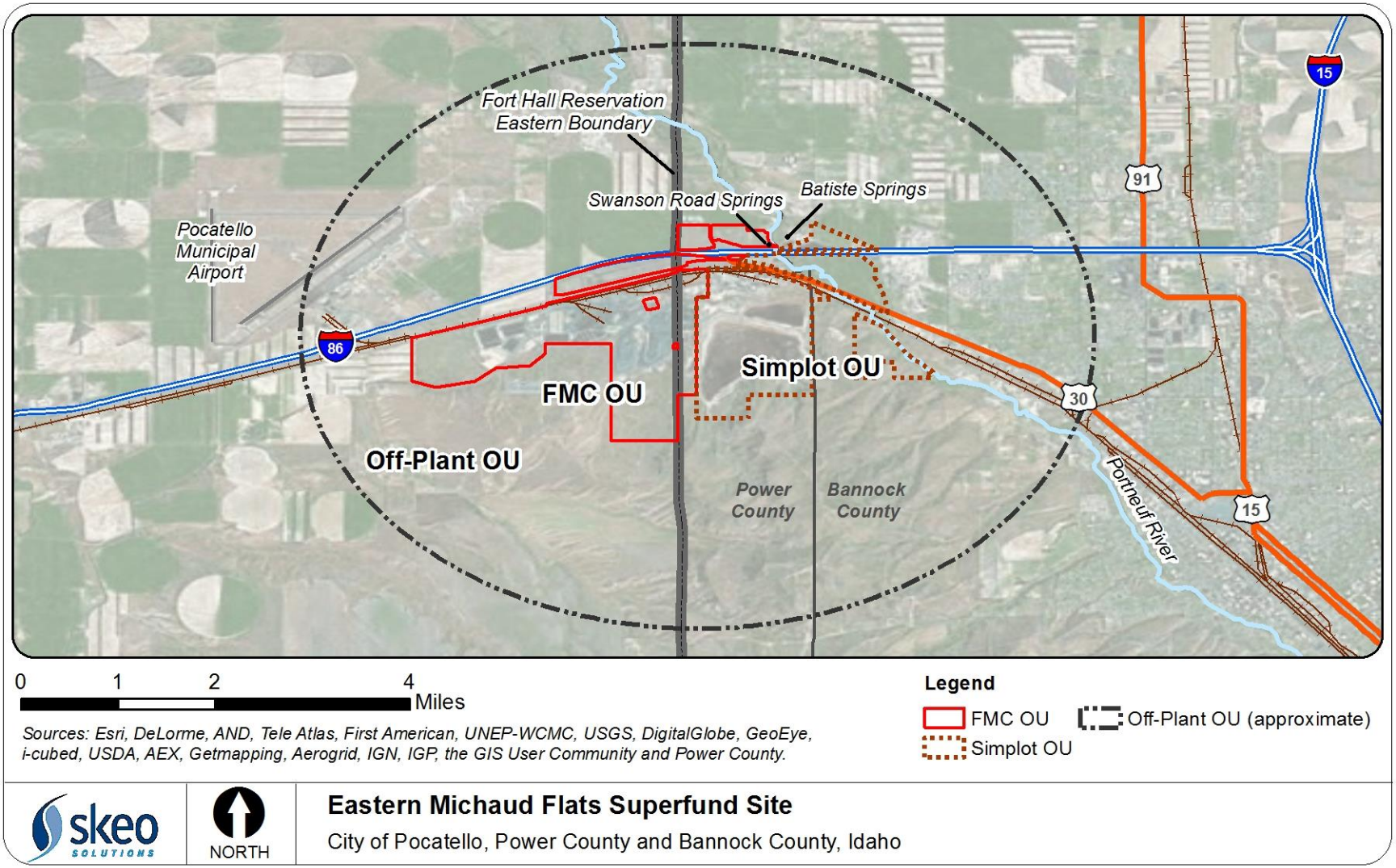
Air emissions from the operating facilities dispersed contaminants to surface soils in the vicinity of the plants. Historically, the soil concentrations in some areas were at levels of potential concern and thus were addressed in the remedy for the Site. Current emissions from the Simplot Don Plant are regulated by the State of Idaho.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

3.4 Initial Response

EPA listed the Site on the National Priorities List (NPL) on August 30, 1990. EPA, FMC and Simplot negotiated an Administrative Order on Consent (AOC), under which FMC and Simplot agreed to conduct a remedial investigation/feasibility study (RI/FS) for the Site. EPA issued the AOC on May 30, 1991.

After EPA issued the RI/FS AOC, both FMC and Simplot completed a number of actions to address environmental releases at the Site. The following actions took place at FMC between 1991 and issuance of the ROD in 1998:

- The slag pit sump was dewatered in March 1991.
- The John Zink Scrubbers were placed in service in December 1991 with the goal of reducing radionuclide air emissions.
- The railroad swale, an area that received stormwater runoff from the operating areas of the plant, was partially lined in 1994.
- Approximately 5 miles of formerly unpaved roadways and 200,000 square feet of formerly unpaved non-roadway plant areas were paved.
- A new, lined solar drying area for Calciner pond solids was constructed and placed into operation in 1993.
- Use of septic systems were eliminated and the entire facility connected to the municipal sanitary sewer system during 1995.
- A new system for waste management of precipitator slurry was initiated, using lime precipitation.
- To control fugitive dust, in 1995 coke unloading was enclosed and dust collected and recycled to the process.
- In August 1993, ventilation and dust collection for ore screening and crushing was improved.
- From 1992 to 1995, furnace tap hoods were modified for chill pits areas to improve collection of emissions from slag and ferrophos tapping.
- The furnace, proportioning, briquetting and shale buildings were tightened in 1994 to reduce fugitive emissions.
- In 1996, the recycling hopper at the ore crusher was improved, and a windscreen was installed to reduce fugitive emissions.

At Simplot, the following actions were taken between 1991 and 1998:

- An unlined ditch transporting water to the treatment pond, was excavated and replaced by sealed pipe.
- Liners were installed in holding ponds in the irrigation water treatment system.
- The leaking transfer line between the nitrogen solutions plant and the urea ammonium nitrate storage tank was repaired.
- The gypsum thickeners in the phosphoric acid plant were upgraded to reduce the water content of the slurry sent to the stack.

- Use of chemical flocculants in the gypsum thickeners was initiated to increase the solids content and improve the settling characteristics of the slurry.
- The calciners were decommissioned in 1992, thus reducing air emissions.
- Some roads within the phosphoric acid plant area were paved to reduce fugitive air emissions.
- Air emission control systems were installed and upgraded within the plant area.

3.5 Basis for Taking Action

Phosphate ore is/was the primary raw material for both the FMC and Simplot operations. Contaminants of Concern (COC) at the Site are primarily linked to constituents of the phosphate ore as well as sulfur and nitrogen used in the Simplot process. Several release mechanisms of contaminants into the surrounding environment were identified, including storage and handling of products, byproducts, wastes and emissions from the two facilities. Primary constituents of the phosphate ore are calcium, phosphorus and fluoride. The ore also contains trace concentrations of other elements including arsenic, beryllium, cadmium, chromium, vanadium and zinc as well as thorium and uranium-238 (and their decay products). Primary risks at the Site are excess risks to human health and the environment from exposure to contaminated soil, groundwater, surface water and air.

COCs in soil were derived from the ore or byproducts of processing the ore. At the FMC OU, elemental phosphorus in the soil at concentrations exceeding 1,000 milligrams per kilogram (mg/kg) were determined to present a significant risk to human health and the environment if exposure were to occur. There was also a potential risk for exposure to toxic gases if elemental phosphorus combusts in the presence of oxygen. EPA determined radium-226 to be a primary COC in surface soil at the FMC OU because of risks associated with gamma exposure. The incremental radiological cancer risks for the exposure pathways arising from soil were determined to be due mainly to external radiation exposure. At some locations the exposure point concentrations are comparable to background levels, but at the locations with the higher incremental radiological cancer risks the exposure point concentrations are at least 1.5 times background levels.

The greatest estimated incremental radiological cancer risks to potential future FMC and Simplot plant area workers that were identified in the RI were from inhalation of radon in buildings that may be constructed on or near soils containing radioactive contaminants, use of contaminated site groundwater as drinking water, and external radiation exposure from radionuclides in the soil.

Groundwater COCs include fluoride, arsenic and phosphorus. Human health risks posed by COCs in groundwater are primarily associated with ingestion of arsenic in drinking water. However, risks posed by phosphorus are primarily associated with excessive phosphorus loading of surface water, resulting in significant alteration or loss of ecological habitat and the decline of various species.

Following signing of the 1998 ROD, EPA further evaluated the data and information available regarding the extent and impact of phosphorus loading to the Portneuf River from the Site. The

two primary sources of phosphorus loading to groundwater identified was migration of process waters percolating through the gypsum stack and releases within the Simplot Don Plant. These releases are contributing to the phosphorus loading to the Portneuf River and have resulted in significant reduction in the natural dissolved oxygen (DO) levels in the river. Reduced DO results in substantial risk to ecological receptors including morbidity, mortality, reproduction and growth effects on biota. These ecological effects are the basis for the need to implement the interim groundwater remedies selected in the FMC and Simplot IRODAs.

Potential risks of adverse effects of fluoride on resident plant and wildlife species of the sagebrush steppe ecosystem were identified in the RI. The estimated risks of fluoride to native biota are only marginally above the threshold for toxic effects, and by inference the species at risk may be marginally but not severely affected. However, the ecological risk assessments did not consider risks to domestic cattle or bison grazing on forage downwind from the Site.

4.0 Remedial Actions

4.1 Remedy Selection

EPA signed the Site's initial Record of Decision (ROD) on June 8, 1998. The selected remedy established two OUs and identified actions for the Off-Plant Area that were included in each of the two OUs. The Off-Plant Area was later defined as the Off-Plant OU.

FMC OU

The Site's initial 1998 ROD included both groundwater and soil remedies for the FMC OU. Following closure of the plant in 2001, EPA concluded that further investigatory work would be required, including characterization of the Former Elemental Phosphorus Production Area. FMC implemented some limited remedial actions selected under the 1998 ROD but this work was not done under an EPA enforcement order and oversight by EPA was limited. EPA and FMC entered into an AOC to conduct a supplemental RI/FS in October 2003 that required FMC to investigate and evaluate the FMC OU areas that were not investigated under the 1991 RI/FS AOC and determine whether additional actions were needed to protect human health and the environment.

Based on the findings of the Supplemental RI/FS and the need for additional actions to reduce arsenic, phosphorus and other COCs in groundwater migrating off the FMC OU and into the Portneuf River, EPA issued the Interim ROD Amendment (IRODA) for FMC on September 27, 2012. This 2012 IRODA replaced the remedial action objectives (RAOs) and the remedy for the FMC OU originally selected in the 1998 ROD. The RAOs in the 2012 FMC IRODA are as follows:

- Prevent human exposure via all potential pathways (external gamma radiation exposure, inhalation of radon in potential future buildings, incidental soil ingestion, dermal absorption and fugitive dust inhalation) to soils and solids contaminated with COCs that would result in an unacceptable risk to human health assuming current or reasonably anticipated future land use.

- Minimize generation of, and prevent exposure to, phosphine and other gases that represent an unacceptable risk to human health and the environment.
- Prevent direct exposure to elemental phosphorus under conditions that may cause it to spontaneously combust, posing a fire hazard as well as resultant air emissions that represent a significant threat to human health or the environment, and prevent such conditions.
- Prevent potential ingestion of groundwater containing COCs in concentrations exceeding risk-based concentrations (RBCs) or ARARs, or site-specific background concentrations if RBCs or ARARs are more stringent than background.
- Reduce the release and migration of COCs to the groundwater from FMC OU sources resulting in concentrations in groundwater exceeding RBCs or ARARs, or site-specific background if RBCs or ARARs are more stringent than background.
- Restore groundwater that has been impacted by the FMC OU to meet RBCs or ARARs for COCs, or site-specific background levels if RBCs or ARARs are more stringent than background, within a reasonable restoration timeframe.
- Reduce the release and migration of COCs to surface water from FMC OU sources at concentrations exceeding RBCs or ARARs, including water quality criteria pursuant to Sections 303 and 304 of the Clean Water Act.

The FMC OU selected interim remedy addresses metals, radionuclides, elemental phosphorus and other COCs identified in soils, fill and groundwater. The amendment was issued as an Interim ROD Amendment rather than a Final ROD Amendment because the timeframe for achieving groundwater restoration is uncertain and because of the uncertain status of the Tribes' soil cleanup standards as ARARs under CERCLA. The selected interim remedy for the FMC OU is described below.

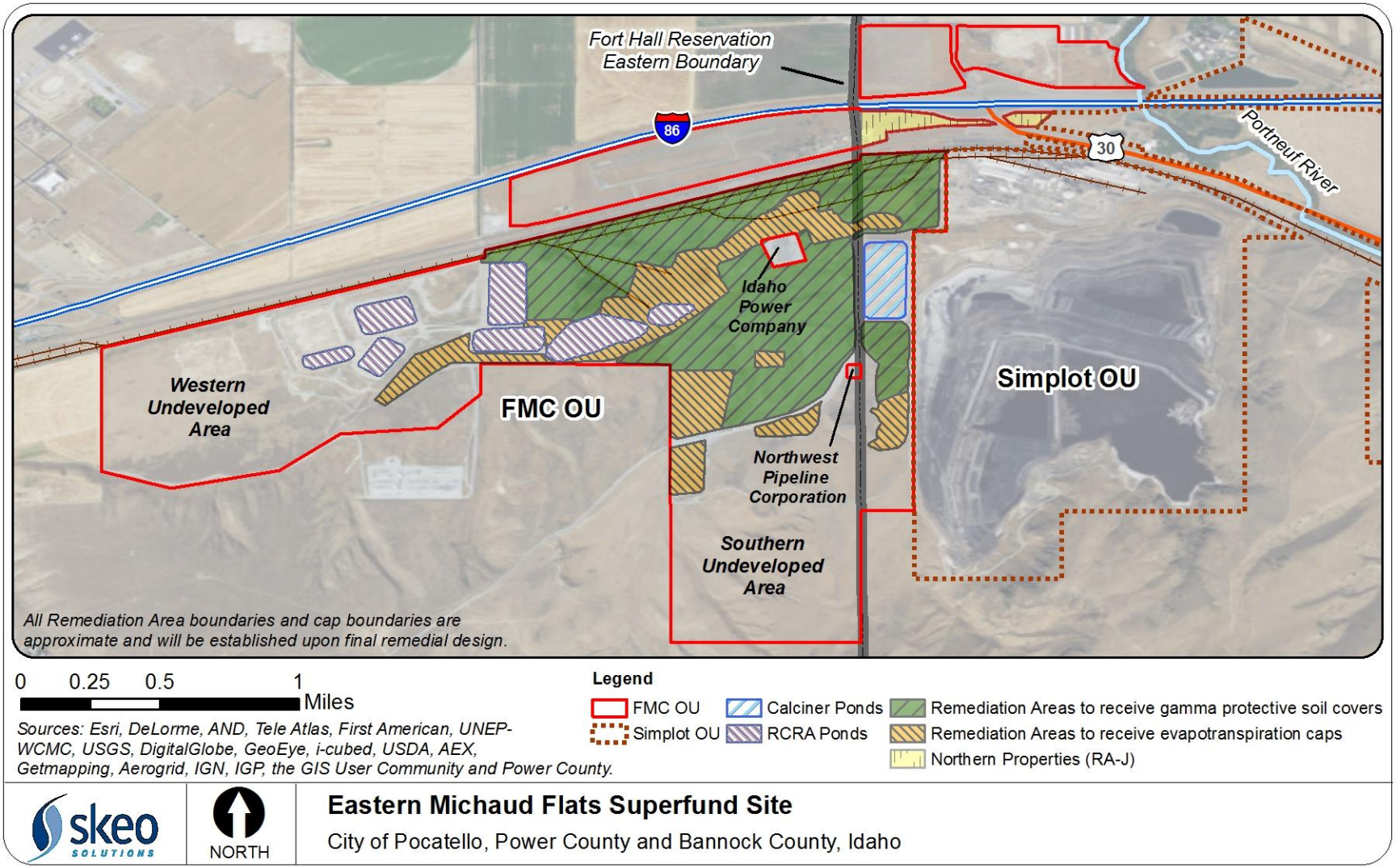
- Place evapotranspiration caps over areas that contain non-slag fill (such as elemental phosphorus, phossy solids, precipitator solids, kiln scrubber solids, industrial waste water sediments, calciner pond solids, calcined ore and plant/construction landfill debris) to (1) prevent migration of contaminants to groundwater, preventing the infiltration of rainwater, and (2) prevent direct contact with contaminants by current and or future workers.
- Place gamma radiation protective soil covers containing approximately 12 inches of soil cover over areas containing slag fill, ore stockpiles and the former Bannock Paving areas to prevent the exposure to gamma radiation and fugitive dust by potential future workers.
- Excavate contaminated soil from Parcel 3 of FMC's Northern Properties, also known as RA-J, and consolidate onto the Former Operations Area to prevent exposure of residents and future workers to elevated levels of radionuclides in surface soil.
- Clean underground reinforced concrete pipes that contain elemental phosphorus and radionuclides to prevent exposure to potential future workers.
- Install an interim groundwater extraction/treatment system to contain contaminated groundwater, thereby prevent contaminated groundwater from migrating beyond the FMC OU and into the Simplot OU and/or adjoining springs or the Portneuf River. Extracted groundwater will either be treated within the FMC OU to drinking water standards and/or risk-based cleanup levels and discharged to an infiltration basin within the FMC OU, where it would percolate down to recharge groundwater or evaporate into the atmosphere, or pumped to a municipal treatment facility in Pocatello for treatment and release in accordance with a National Pollutant Discharge Elimination System (NPDES) permit.

- Implement a long-term groundwater monitoring program to evaluate the performance of the soil and groundwater remedial actions (to determine their effectiveness in reaching the cleanup levels), and provide information needed for developing a final groundwater remedy if the current interim remedy cannot meet cleanup requirements within an acceptable timeframe.
- Implement a gas monitoring program at the FMC OU capped ponds (also referred to as CERCLA Ponds to distinguish them from the RCRA-regulated ponds) and subsurface areas where elemental phosphorus is present, to identify potential phosphine and other potential gas generation at concentrations that could pose a risk to human health.
- Implement and maintain institutional controls that include environmental land use easements that prohibit activities that may disturb remedies (such as digging in capped areas) and restrict the use of contaminated groundwater.
- Install engineering controls or barriers, such as additional fencing to further limit site access.
- Implement a remedy management system to integrate the existing RCRA Pond caps with the development of new caps, access roads, groundwater extraction system and utility lines.
- Implement an FMC OU-wide stormwater runoff management plan to minimize cap erosion and the infiltration of COCs to groundwater, including FMC OU-wide grading and the collection of stormwater in retention basins.
- Conduct operations and maintenance of implemented remedial actions.

Although 16 soil COCs were identified, cleanup levels were only established for five constituents that were found to be the risk drivers for surface soils. Cleanup levels have been defined for arsenic, cadmium, fluoride, lead-210 and radium-226. Caps or soil covers will be installed over all areas in the former operations area known to contain waste and with surface soils that exceed the soil cleanup levels for the five risk driver COCs. Gamma radiation protective soil covers will be placed over areas containing slag fill, ore stockpiles and the former Bannock Paving areas to prevent the exposure to gamma radiation and fugitive dust by potential future workers. Evapotranspiration caps will be placed over areas that contain non-slag fill to prevent migration of contaminants to groundwater, preventing the infiltration of rainwater, and prevent direct contact with contaminants by current and or future workers. Cleanup levels established for the risk drivers for groundwater and soil COCs in the 2012 FMC IRODA are presented in Table 2.

The 2012 FMC IRODA clarifies that other actions, including closure and compliance actions under RCRA, have been and continue to be performed at RCRA-regulated units of the FMC elemental phosphorous plant. The RCRA-regulated ponds are not part of the FMC OU and remain regulated under RCRA. The RCRA Ponds are also subject to a Unilateral Administrative Order issued by EPA in 2010 requiring monitoring to determine the nature and extent of releases of phosphine gas from the RCRA ponds and the extraction and treatment of phosphine gas as required by the Order.

Figure 3: FMC OU Features



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Simplot OU

The remedies selected in the 1998 ROD for the Simplot OU addressed exposure from groundwater, air and soil sources. On May 9, 2002 EPA and Simplot entered into a Consent Decree to implement these remedies.

Following signing of the 1998 ROD, EPA further evaluated the data and information available regarding the extent and impact of phosphorus loading to the Portneuf River from the Site. EPA subsequently determined that augmentation of the selected remedy utilizing additional actions was necessary to address risks to aquatic receptors in the Portneuf River posed by elevated phosphorus levels.

EPA issued the IRODA for the Simplot OU on January 20, 2010. The IRODA added the hazardous substance phosphoric acid (measured as total phosphorus or dissolved orthophosphorus and referred to as phosphorus) as a COC and required additional ground water extraction, a synthetic liner be installed on the receiving area of the gypsum stack and implementation of source controls in the Phosphoric Acid Plant (PAP)Area. Selected remedial actions for soil and air releases were not changed by the IRODA. EPA issued an interim rather than final RODA because the Simplot Don Plant is an operating facility and is expected to remain so for the foreseeable future and because additional evaluation of remedial actions are expected at the time of plant closure.

For the Simplot OU, RAOs from the 1998 ROD and the 2010 IRODA include:

- Reduce the exposure to radon that would occur in future buildings constructed within the Simplot Don Plant areas under a future industrial scenario.
- Prevent external exposure to radionuclides in soils at levels that pose estimated excess cancer risks greater than 1×10^{-4}, or site-specific background levels where that is not practicable.
- Prevent ingestion or inhalation of soils containing COCs at levels that pose estimated excess risks above 1×10^{-4}, a non cancer risk HQ of 1, or site specific background levels where that is not practicable.
- Reduce the release and migration of COCs to the groundwater from facility sources that may result in concentrations in groundwater exceeding RBCs or chemical-specific ARARs, specifically MCLs.
- Prevent ingestion of groundwater containing COCs having concentrations exceeding RBCs or MCLs (chemical-specific ARARs).
- Restore groundwater that has been impacted by site sources to meet all RBCs or MCLs for the COCs.
- Reduce the release and migration of COCs to surface water from facility sources that result in concentrations exceeding RBCs or ARARs, including ambient water quality criteria (AWQC) pursuant to the Clean Water Act.
- Achieve source control for the existing gypsum stack and Simplot Don Plant area (phosphoric acid plant) within the shortest practicable timeframe.

The remedy for the Simplot OU, selected in the 1998 ROD and supplemented by the 2010 Simplot IRODA, included the following components (Figure 4):

- Development, operation, maintenance and augmentation to the extent necessary, of the groundwater extraction system to keep COCs levels at or below cleanup levels in affected groundwater downgradient of the gypsum stack and phosphoric acid plant area.
- Installation of a synthetic liner on the receiving surface of the gypsum stack to reduce the infiltration of contaminated water through the stack into groundwater.
- Development and implementation of a verifiable plan to control the sources of phosphorus and other COC releases to the environment at or from the Simplot OU.
- Subsequent to source control, development of protective numerical cleanup levels for COCs in groundwater migrating toward the Portneuf River consistent with the Total Maximum Daily Load (TMDL) established for the river, and identification of monitoring points in the river and groundwater.
- Monitoring of groundwater and implementation of institutional controls to prevent use of contaminated groundwater for drinking purposes. Groundwater monitoring and institutional controls will continue until COCs in groundwater decline to below MCLs or RBCs for those substances.
- Construction of a stable road surface over the gypsum stack to reduce fugitive emissions.
- Excavate solids from the Dewatering Pit and dispose of excavated material on the gypstack and cover the excavated area with soil and vegetation.
- Excavate solids at the East Overflow Pond, dispose of excavated material on the gypstack and cover the excavated area with a new double lined surface impoundment for collection of non-hazardous plant water.
- Implementation of institutional controls to prevent potential future residential use of the Simplot property and control potential worker exposures under current and future ownership.

Cleanup levels established for groundwater COCs in the 2010 Simplot IRODA are presented in Table 2.

Remedial action within the Simplot OU to address Simplot sources to groundwater and the Portneuf River are Simplot OU remedies, not Off-Plant OU remedies.

Figure 4: Simplot OU Features

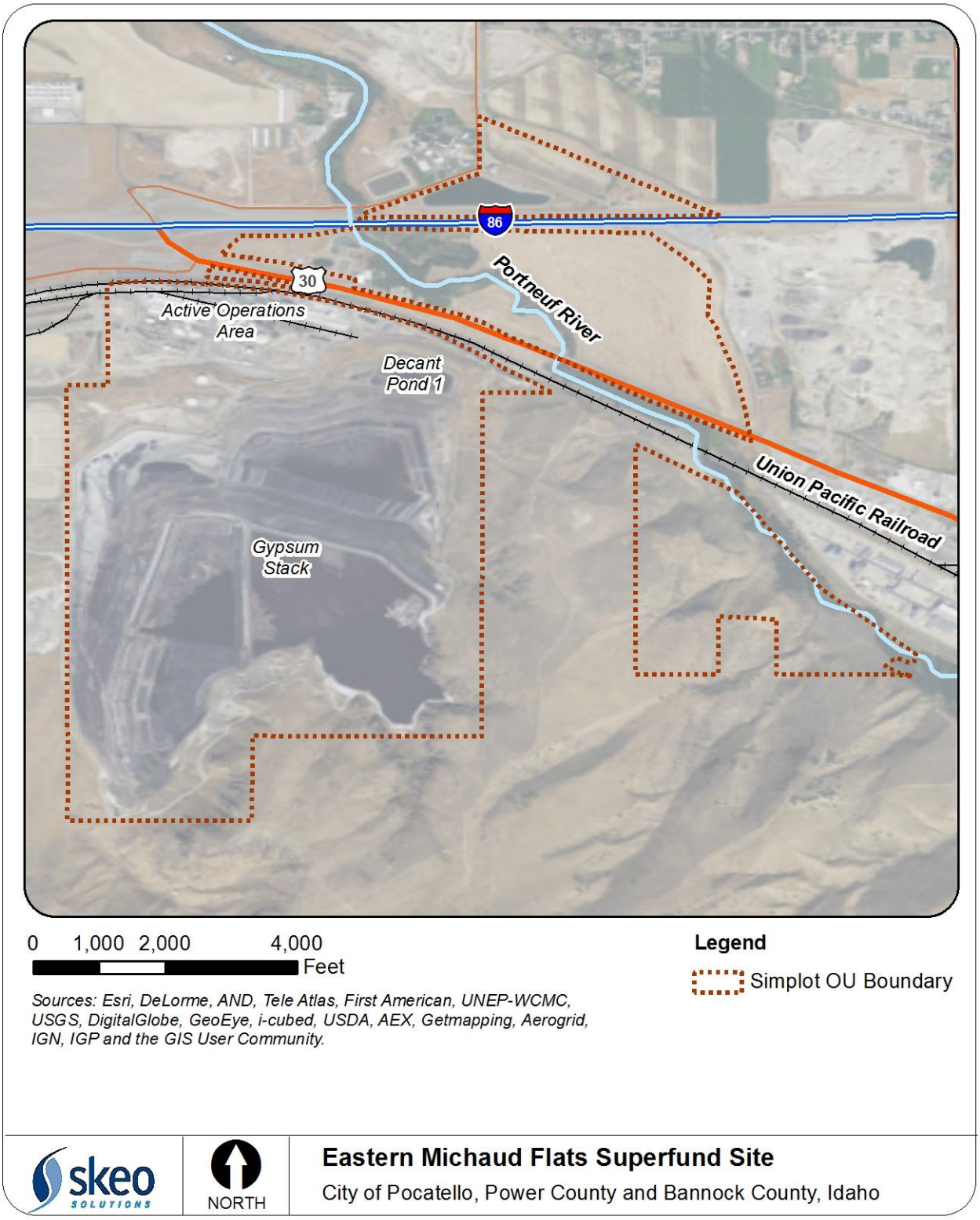


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Table 2: Cleanup Levels for FMC and Simplot OUs

COC	Groundwater Cleanup Level in 2010 Simplot IRODA	Groundwater Cleanup Level in 2012 FMC IRODA	Soil Cleanup Level in 2012 FMC IRODA
Antimony	0.006 mg/L	0.006 mg/L	No cleanup level established
Arsenic	0.01 mg/L	0.01 mg/L	150 mg/kg
Beryllium	0.004 mg/L	0.004 mg/L	No cleanup level established
Boron	No cleanup level established	1.36 mg/L	No cleanup level established
Cadmium	0.005 mg/L	0.005 mg/L	39 mg/kg
Chromium	0.1 mg/L	0.1 mg/L	Not a soil COC
Fluoride	4 mg/L	4 mg/L	49,000 mg/kg
Lead-210	Not a groundwater COC	Not a groundwater COC	67 pCi/g
Manganese	No cleanup level established	0.0777 mg/L	No cleanup level established
Mercury	0.002 mg/L	0.002 mg/L	No cleanup level established
Nickel	0.1 mg/L	0.1 mg/L	No cleanup level established
Nitrate	10 mg/L	10 mg/L	Not a soil COC
Phosphorus	TBD[a]	TBD[a]	Not a soil COC
Phosphorus (elemental)	Not a groundwater COC	0.00073 mg/L	No cleanup level established
Polonium-210	Not a groundwater COC	Not a groundwater COC	No cleanup level established
Potassium-40	Not a groundwater COC	Not a groundwater COC	No cleanup level established
Radium-226	5 pCi/L	5 pCi/L	3.8 pCi/g
Selenium	0.05 mg/L	0.05 mg/L	No cleanup level established
Silver	Not a groundwater COC	Not a groundwater COC	No cleanup level established
Thallium	0.002 mg/L	0.002 mg/L	No cleanup level established
Tetrachloroethene	0.005 mg/L	0.005 mg/L	Not a soil COC
Trichloroethene	0.005 mg/L	0.005 mg/L	Not a soil COC
Vanadium	0.108 mg/L	0.108 mg/L	Not a soil COC
Zinc	3.92 mg/L	3.92 mg/L	Not a soil COC
Gross Alpha	15 pCi/L	15 pCi/L	No cleanup level established
Gross Beta	4 mrem/yr	4 mrem/yr	No cleanup level established

Notes:
a. To be determined (TBD) – PRPs will develop for EPA approval of a RBC for phosphorus. The final cleanup level will be selected in a subsequent decision document.
pCi/g =picocuries per gram
pCi/L = picocuries per liter
mg/L = milligrams per liter
mrem/yr= millirems per year

Off-Plant OU

The selected remedy in the 1998 ROD combined all actions into two operable units, the FMC Plant OU and Simplot Plant OU. The series of actions selected for the Off-Plant Area were included in both OUs. On July 21, 1999 EPA lodged two proposed RD/RA Consent Decrees with the Federal District Court, one with FMC and the other with Simplot, and opened a 30-day public comment period. In response to comments received, EPA withdrew the proposed Consent Decrees and determined it appropriate to address the Off-Plant Area as a separate OU.

For the Off-Plant Areas, the 1998 ROD addressed potential risks to humans from exposures from soils and groundwater and potential risk to ecological receptors from fluoride. The 1998 ROD identified the following RAOs for the Off-Plant OU:

- Prevent future consumption of homegrown produce grown in areas of the Site where soil constituents' levels result in a potential non-carcinogenic risk exceeding a hazard quotient (HQ) of 1.
- Prevent external exposure to radium-226 in soils at levels that pose cumulative estimated excess risks above 1×10^{-4}.
- Prevent the potential for future impacts to ecological receptors by monitoring fluoride at the Site and surface water at springs. If monitoring data indicate that fluoride levels in the environment are increasing beyond that observed during the RI sampling and the potential for an unacceptable ecological risk is indicated, additional actions, including source controls, may be required.

The selected remedy included the following components:

- Monitor fluoride levels around the Site in order to determine the levels of fluoride present and to evaluate the potential risk to ecological receptors. If measured levels indicate a risk may exist, further evaluation would occur followed by source control or other action, if necessary.
- In Off-Plant areas where soil contaminant levels exceed a HQ of 1 for cadmium and/or which pose a 1 in 10,000, or greater, excess risk from radium-226, implement legally enforceable land use controls restricting use of agricultural products grown thereon for human consumption due to the presence of cadmium and to prevent future residential use for those areas contaminated with radium-226.
- In areas not found to exceed the criteria established for land use controls, but was either close enough to the threshold, or adjacent to lands that exceeded the threshold to warrant notification to current and future property owners if residential use is likely to occur, the PRPs shall monitor property use for residential development and inform residential property owners of potential human health risks.
- Conduct groundwater monitoring in the Off-Plant Area to: 1) determine the effectiveness of the FMC and Simplot Plants' source control measures; 2) ensure contaminants are not migrating into the Off-Plant Area; and, 3) ensure that the remedy remains protective of human health and the environment.

Remedial actions to address FMC and Simplot sources to groundwater and the Portneuf River are FMC and Simplot OU remedies, not Off-Plant OU remedies.

4.2 Remedy Implementation

FMC OU

The FMC OU is in the remedial design and remedial action (RD/RA) phase of implementing the 2012 IRODA. EPA issued the Remedial Design/Remedial Action Unilateral Administrative Order (UAO) to FMC (effective June 20, 2013) requiring FMC to implement the IRODA in accordance with design documents and work plans approved by EPA. Remedial design began shortly after issuance the UAO and is expected to be completed in early 2016. Remedial action construction began September 5, 2014 and is expected to continue into 2016.

Soil Remedy: The grading phase of the remedial action was approved on September 5, 2014; construction began on September 22, 2014. The grading phase is scheduled to be complete in the fall of 2015, at which time installation of evapotranspiration (ET) and gamma caps will commence. The caps are scheduled to be complete in early 2016.

As of July 31, 2015, FMC had graded approximately 3.3 million cubic yards of the total 3.7 million cubic yards estimated to require grading. The goal of the grading is to provide a stable surface conducive to proper drainage in preparation for placement of soil caps.

FMC completed remedial action soil removal required at RA-J on October 31, 2014. Confirmatory sampling demonstrated cleanup levels met industrial standards as specified in the IRODA. (Institutional controls are in place to prevent residential use.) As shown in Table 3, the upper confidence limits (UCLs) for the soil COCs are below their respective industrial-based cleanup levels.

Groundwater Remedy: FMC installed three pilot test extraction wells in March-April 2014 to inform the preliminary (30%) groundwater extraction and treatment system and monitoring program remedial design. The intermediate (60 %) remedial design is scheduled to be completed in September 2015, followed by the final remedial design in late 2015. Construction completion for the groundwater extraction and treatment system is scheduled for 2016.

Institutional Controls: The 2013 UAO requires institutional controls to be implemented in accordance with an EPA approved Institutional Control Implementation and Assurance Plan (ICIAP). FMC has submitted a draft ICIAP that is currently under EPA review. FMC will implement the ICIAP after it has been revised to address the comments and approved by EPA. Institutional controls will be designed to include environmental land use restrictions prohibiting activities that disturb implemented remedies and restrict the use of contaminated groundwater.

Groundwater Monitoring: The FMC OU has three groundwater monitoring programs: the CERCLA groundwater monitoring program, the RCRA groundwater monitoring program and the Calciner Pond (Idaho DEQ) groundwater monitoring program.

FMC has been conducting groundwater monitoring under CERCLA since the 1998 ROD. In 2010, FMC revised their monitoring program and developed the "Interim CERCLA Groundwater Monitoring Plan." The interim program will be in effect until a long-term groundwater monitoring program is approved. The UAO requires that the Final CERCLA Groundwater Monitoring Plan be coordinated with the RCRA and Calciner Pond groundwater monitoring programs.

Table 3: RA-J Confirmation Surface Soil Results Compared to Industrial Standards

COC	Surface Soil (0-2 inches)		Surface Soil (2-6 inches)	
	UCL	Industrial Standards	UCL	Industrial Standards
Cadmium	13.3 mg/kg	39 mg/kg	NA	NA
Radium-226	1.71 pCi/g	3.8 pCi/g	1.34 pCi/g	3.8 pCi/g
Lead-210	1.9 pCi/g	3.0 pCi/g	1.36 pCi/g	2.1 pCi/g
Uranium-238	1.8 pCi/g	2.3 pCi/g	1.32 pCi/g	2.4 pCi/g

a. The confirmation soil data compared with cleanup goals were presented in the February 2015 FMC OU Soil Remedial Action Performance Standards Verification Plan For RA-J and Cleaning Stormwater Piping In RA-A, RA-J Confirmation Soil Sampling Report.
NA = not applicable

Dust Control: The EPA-approved September 2014 Dust Control and Air Monitoring Plan (DCAMP) established a goal of no visible dust to be met through the use of watering and other dust prevention/suppression measures. A revised DCAMP was approved in March 2015. The DCAMP requires FMC to establish a particulate monitoring network of fixed and mobile monitors and to monitor total suspended particulates (TSP) during the grading phase work. Mobile monitors are located in the remedial action construction areas and fixed monitors are located along property boundaries.

Each monitor provides an alert when TSP readings of 152 micrograms per cubic meter or higher are recorded, indicating a need for additional dust prevention/suppression measures. The trigger level represents one-tenth of the allowable Occupational Safety and Health Administration (OSHA) limit to protect site workers. The relationship between TSP and likely COC concentrations derived in the DCAMP was based upon the maximum historically observed concentrations in soil, ore, and slag.

Real-time TSP measurements at each monitor and prevailing weather conditions onsite are available online. In addition, FMC provides EPA, IDEQ and the Tribes concurrent weekly monitoring data and quarterly reports. Based upon observations from EPA onsite representatives and data collected under the DCAMP, workers and the surrounding community have not been at risk from remedial action generated dust. Section 6.4 of this FYR reviews data acquired from DCAMP implementation.

Pyrophoric Materials: Debris containing P4 waste has been encountered about once each day during the grading phase. The phosphorous spontaneously combusts when exposed to air and the debris begins to smolder, thus making it recognizable by site workers. As of September 10,

2015 FMC's emergency response contractor had safely suppressed, transported, and placed into temporary storage about 850 cubic yards of P4 containing waste along with wet sand used as quenching material from 200 occurrences (Appendix F).

Simplot OU

EPA and Simplot entered into a Remedial Design/Remedial Action Consent Decree on May 9, 2002 for the implementation of remedial actions selected in the 1998 ROD. On November 16, 2010 the Consent Decree was amended to include the additional actions selected in the 2010 IRODA.

Remedial work at the Former East Overflow Pond was completed in 1997. A report describing the completion of this remedy component was submitted to EPA on August 2, 2002.

Remedial design for the required actions at the Dewatering Pit began in May 2002 and were completed in November 2002. Work at the Dewatering Pit began in April 2003 and was completed in 2005.

Remedial design for the Gypsum Stack Roads began May 2002 and was completed May 2003. Implementation of this remedy component began in September 2004 and was completed in 2005. Regular inspections of the roads take place pursuant to an O&M Plan.

Remedial design for the groundwater extraction system began in 2002 and was implemented in three phases. The groundwater extraction system currently consists of a network of 12 Upper and Lower Zone wells near the northern and northwestern edge of the gypstack and downgradient of the Simplot Phosphoric Acid Plant Area. The wells are located to intercept groundwater affected by gypsum stack seepage as well as by sources in the Phosphoric Acid Plant Area before it would otherwise mix with impacted groundwater from the FMC OU and regional groundwater inflow and discharge into the Portneuf River.

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The remedial design for the groundwater extraction system was completed in June 2010. Simplot began remedial action construction on June 28, 2010. EPA certified the groundwater extraction and monitoring system was operational and functional on July 2, 2012. In February 2013 groundwater exhibiting RCRA hazardous waste characteristics was found at Well 419. Simplot is not currently pumping this well, creating a gap in the extraction system that allows high phosphorus groundwater to move downgradient to the river. Simplot is evaluating alternatives for removing the hazardous characteristic waste and reestablishing groundwater containment.

The selected remedy in the 2010 IRODA included implementing source controls at the gypstack and in the Phosphoric Acid Plant Area. Source control for the gypstack will be achieved by capping the existing surface of the gypstack with a high-density polyethylene cap/liner (referred to as a liner). The liner covers the receiving areas for gypsum byproduct from current operations and include the infrastructure necessary to route the water that collects on the liner back to the plant. Water draining from below the liner is extracted by the extraction well network discussed above.

In order for Don Plant operations to continue during construction, the gypstack lining project is currently divided into six stages. Construction began with the excavation and construction of the decant pond in 2009 (Phase 1). As of June 2015 work had been completed on the decant pond and lower stack (Phase 1, 2010), north upper west compartment (Phase 2, 2012), south upper west compartment (Phase 3, 2013) and west side of the upper east compartment (Phase 4, 2014). In 2014, Simplot informed EPA of a desire to expand the footprint of their gypsum stack (Phase 6 lateral expansion) and provided EPA with an analysis showing this expansion was not expected to impact the CERCLA remedy. The Phase 6 lateral expansion at the northwest corner of the existing gypsum stack is scheduled to be completed in 2015 and the final section, the east side of the upper east compartment (Phase 5), is scheduled to be completed in 2016 (Figure 5).

Source controls in the Phosphoric Acid Plant Area have been identified in a draft Phosphorus Source Control Program. The program includes regular inspections of tanks, pads and sumps as well as upgrades to tanks, pads and sumps identified as potential sources of COCs to the groundwater. Additional source control projects are proposed annually. Source control projects implemented in 2014 consisted of 19B pad replacement, #2 De-Flo Tank and foundation upgrades, Re-Pulp Tank and foundation upgrades, and ongoing inspections of tanks, pads and sumps.

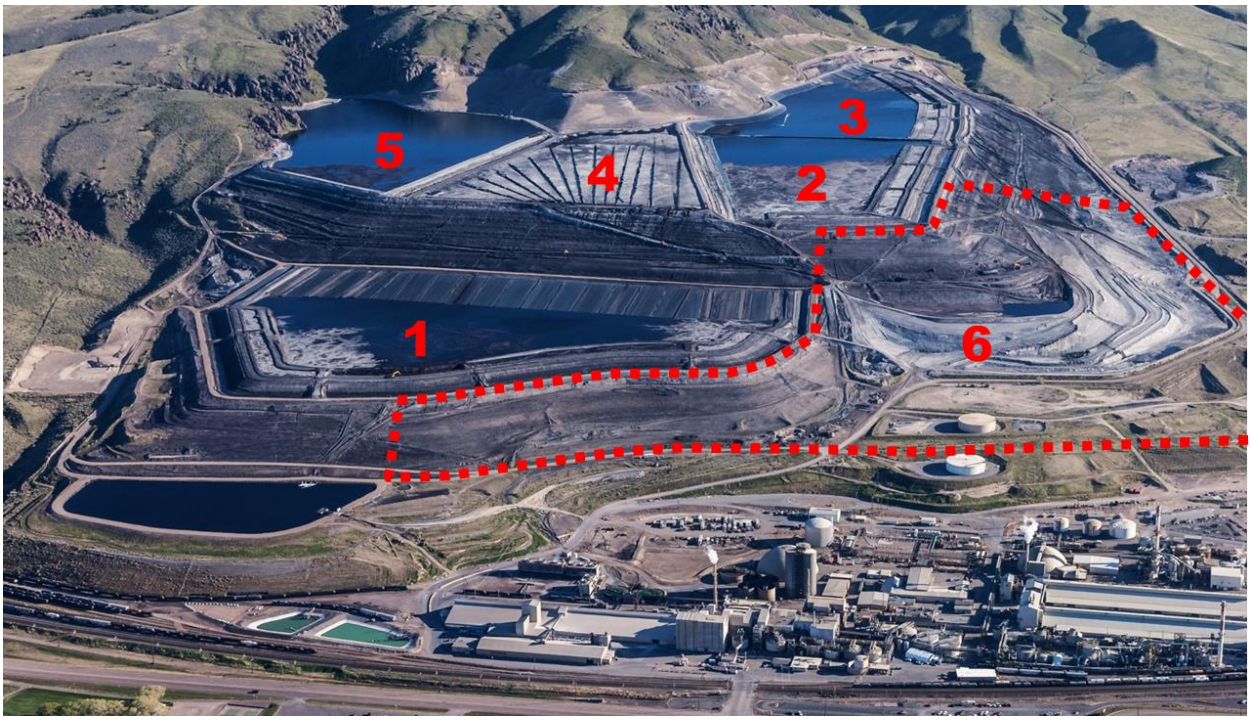
As mentioned above, in February 2013 groundwater exhibiting RCRA hazardous waste characteristics was extracted from well 419. Due to regulatory constraints, regarding the use of water with hazardous characteristics as plant process water, and the lack of a viable alternative in the ROD or IRODA, pumping was discontinued at the well while alternatives were explored. A supplemental investigation identified a pool of dense, low pH/high phosphorous liquid (referred to as DAPL or dense aqueous phase liquid) located in a depression in the American Falls Lake Bed Clay near well 419. A more diffuse layer was found between the top of the DAPL and the dissolved phase plume originating from the gypsum stack.

Simplot is currently implementing a treatability study to establish whether extraction followed by lime treatment of hazardous-characteristic groundwater in the Phosphoric Acid Plant Area can be used to effectively batch treat the extracted DAPL to a level where the water can be reused in the plant and the sludge disposed of on the gypstack. An additional objective of the treatability study is to determine operational procedures for extracting highly contaminated groundwater over a range of water quality and flow conditions. As part of that study a temporary pilot treatment system for extracted groundwater which exhibited RCRA hazardous waste characteristics was constructed and began operating in February 2014. The results of this study are being used to evaluate how to extract the DAPL and reestablish pumping of the dissolved plume in that area.

On June 14, 2014, Simplot identified that the basin and secondary containment at Sump 6 had been compromised and the phosphoric acid and water mixture collected at the sump had been released to the environment. The Simplot made temporary repairs to the sump basin to minimize disruptions in plant operations and inspection frequency of this sump was increased. Additional upgrades to Sump 6 occurred in June 2015. This release is likely the source of the DAPL seen in the well 419 area.

The Portneuf River and groundwater impacted by releases from the Simplot OU is monitored pursuant to the June 2010 Groundwater and Surface Water Monitoring Plan. See section 6.4 of this report for more details.

Figure 5: Phases of Source Control Work on the Gypstack



Off-Plant OU

The selected remedy calls for implementation of institutional controls where cadmium and radium concentrations in soils exceed specified risk thresholds, fluoride monitoring to determine if additional source controls or other actions are needed to address impacts from fluoride and groundwater monitoring to evaluate effectiveness of the remedial actions implemented at the FMC and Simplot OUs.

In order to help identify the areas where institutional controls were required, in 2010 FMC and Simplot sampled soils in the Off-Plant OU. Samples were analyzed for radium-226, uranium - 238 and cadmium. In addition, FMC sampled cadmium levels found in home grown produce gathered from a site immediately north of the two plants. The results were presented in a Comprehensive Letter Report Documenting Potential Human Health Risks for Site COCs in the Off-Plant OU (Hanna Associates, April 2011). EPA has not yet made a determination of where institutional controls are required under the 1998 ROD.

The 1998 ROD also required additional monitoring of fluoride and evaluation of the data to determine if additional source controls or other actions were needed. Sampling has occurred as part of a supplemental investigation in support of a reassessment of ecological risks in the Off-Plant OU and under State programs. The additional information, new toxicity information and

EPA's updated ecological risk assessment guidance was used by FMC and Simplot to complete the *Ecological Risk Assessment of Fluoride, Eastern Michaud Flats Superfund Site Offplant Operable Unit* (Formation Environmental, 2010). The assessment concluded that fluoride risks were present at the individual level but widespread or significant ecological effects at the population and community levels are not expected.

The potential risks to domestic cattle or bison were not considered in EPA's 1995 Ecological Risk Assessment or in the 2010 reassessment. Dental fluorosis is known to be the most sensitive endpoint of concern for exposure of livestock to dietary sources of fluoride. Therefore, EPA completed an additional evaluation of soil and forage thresholds relative to fluorosis risks to cattle. The evaluation indicates that risks to grazing mammals from fluorosis exceed an HQ of 1 at several locations within the Off-Plant OU. EPA has not yet determined what additional source controls or other actions are required by the 1998 ROD. In the interim, fluoride concentrations in forage downwind of the Simplot Don Plant are being monitored under a State air permit.

In order to better understand risks to tribal members harvesting plants in the Bottoms Area from fluoride exposure, in 2011 EPA collected soil and vegetation samples from a plot in the Bottoms Area. The results found fluoride concentrations consistent with background levels.[1]

Monitoring of groundwater and surface water in the Off-Plant OU is conducted pursuant to the monitoring plans for the FMC and Simplot OU. FMC regularly collects samples from wells between the former plant and the Portneuf River. Simplot analyzes data from groundwater wells and springs located between the plant area and the Portneuf River.

The results of the additional studies are presented in Section 6.4.

4.3 Operation and Maintenance (O&M)

Remedy implementation is still ongoing at the Site. O&M occurs on remedy components that have been implemented to date.

FMC OU

At the FMC OU, groundwater monitoring continues to take place. Quarterly groundwater level (elevation) measurements take place at numerous monitoring wells that provide relatively uniform coverage across the FMC OU. Monitoring is being conducted semiannually for dissolved oxygen, oxidation-reduction potential, pH, turbidity, temperature and specific conductance as well as common ions (chloride, potassium and sulfate), metals (arsenic and selenium) and general water quality (fluoride, nitrate and total phosphorous). Monitoring is consistent with the EPA approved 2010 Interim CERCLA Groundwater Monitoring Plan. In accordance with the UAO, a Final Groundwater Monitoring Plan will be developed and implemented upon completion of the construction of the groundwater extraction and treatment system.

[1] Final Report of Investigation and Sample Results for the Fluoride Sampling in Soil and Vegetation in the Bottoms Area of the Fort Hall Reservation Near the Eastern Michaud Flats Superfund Site. March 8, 2013. Booz Allen Hamilton.

Simplot OU

Two O&M Plans and a Groundwater and Surface Water Monitoring Plan are currently being implemented at the Simplot OU. A separate O&M Plan for the Gypstack Lining Project is scheduled to be submitted in 2016.

The Gypsum Stack Roads O&M Plan was included as Section 6.0 of the May 29, 2003 *Remedial Design Report and Remedial Action Work Plan, Gypsum Stack Roads, Simplot Plant Area, Eastern Michaud Flats Superfund Site* report. EPA approved the plan on June 1, 2004. Regular road inspections occur and rerouting of roads occurs as needed.

A draft O&M Plan for the Simplot groundwater extraction system was developed in 2009 and is currently being implemented[2]. The plan was amended in 2015 to incorporate additional procedures for well inspection and cleaning. The objective of the extraction system is to prevent the migration of arsenic, phosphorous and other COCs at concentrations above the MCLs or groundwater RBCs into the Off-Plant Area. The extraction system will operate at least as long as the gypstack is receiving gypsum or liquids.

The extraction system is continuously monitored by Simplot Don Plant personnel. Extraction well discharge water is sampled quarterly, concurrent with other groundwater sampling. See section 6.4 of this report for more details.

O&M costs are not yet available.

5.0 Progress Since the Last Five-Year Review

This is the first FYR for the Site.

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 10 initiated the FYR in December 2014 and scheduled its completion for September 2015. The EPA remedial project manager (RPM) for the Simplot and Off-Plant OUs, Jannine Jennings, led the EPA site review team, which also included the EPA FMC OU RPM Jonathan Williams, the EPA community involvement coordinator (CIC) Kay Morrison, EPA hydrogeologist Bernie Zavala and contractor support provided to EPA by Skeo Solutions. In December 2014, EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review schedule established consisted of the following activities:

- Community notification.
- Document review.

[2] Draft Operation and Maintenance Plan/Manual Groundwater Extraction System. Simplot Operable Unit Eastern Michaud Flats Superfund Site. Pocatello, Idaho. Formation Environmental, LLC. October 2009.

- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

In March 2015, EPA published a public notice in the Idaho State Journal newspaper announcing the commencement of the FYR process for the Site, the dates and locations of two public information sessions and inviting community participation. During the two public information sessions many residents talked with EPA about their perspectives on the Site. One resident provided comments via email as a result of the information session and participating in an interview. These comments were considered during the FYR process and are summarized in Section 6.6 and Appendix C. The press notice is available in Appendix B.

The final FYR Report will be made available to the public on EPA's website.

6.3 Document Review

This FYR included a review of relevant, site-related documents, including, but not limited to, the ROD, IRODAs, and annual reports. A complete list of the documents reviewed can be found in Appendix A.

ARARs Review

Groundwater ARARs
The ROD and IRODAs for the FMC and Simplot OUs include a RAO to restore groundwater to meet RBCs or chemical-specific ARARs, the federal MCL established under EPA's Safe Drinking Water Act or site-specific background levels if RBCs or ARARs are more stringent than background. The cleanup level for arsenic in groundwater was revised in the 2010 and 2012 IRODAs to be consistent with the MCL. As indicated in Table 4, no MCLs have changed since the IRODAs were issued. As stated in the FMC IRODA, when a final remedy is implemented, any additional ARARS are to be fully complied with unless a formal waiver is invoked at or before the completion of the remedial actions.

Table 4: ARAR Review for Groundwater COCs

COC	Groundwater Cleanup Levels (mg/L)[a]	Current MCL[b] (mg/L)	Change in Standard
Antimony	0.006	0.006	None
Arsenic	0.01	0.01	None
Beryllium	0.004	0.004	None
Boron*	1.36[c]	NA	None
Cadmium	0.005	0.005	None
Chromium	0.1	0.1	None
Fluoride	4	4	None
Manganese*	0.0777[c]	NA	None
Mercury	0.002	0.002	None
Nickel	0.1	0.1	None
Nitrate	10	10	None
Phosphorus	TBD	NA	NA
Phosphorus (elemental)*	0.00073[c]	NA	NA
Radium-226	5 pCi/L	5 pCi/L	None
Selenium	0.05	0.05	None
Thallium	0.002	0.002	None
Vanadium	0.108[c]	NA	None
Zinc	3.92[c]	5	NA
Tetrachloroethene	0.005	0.005	None
Trichloroethene	0.005	0.005	None
Gross Alpha	15 pCi/L	15 pCi/L	None
Gross Beta	4 mrem/yr	4 mrem/yr	None

a. Obtained from Table 1 of the 2010 Simplot OU IRODA and Table 8 of the FMC 2012 IRODA.
b. Current MCLs were obtained at http://water.epa.gov/drink/contaminants/index.cfm (accessed 5/13/2015).
c. Risk-based concentration for groundwater; value is based on drinking water and watering homegrown produce and a target risk of 1 x 10^{-6} or a noncancer hazard quotient of 1.
NA = no MCL established for this COC
TBD = to be determined
* Only a COC for the FMC OU

Surface Water ARARs

The 1998 ROD, the 2010 Simplot IRODA and the 2012 FMC IRODA identify surface water quality criteria developed consistent with 40 CFR Part 131 and the Idaho Surface Water Quality Standards as ARARs. In addition, the FMC and Simplot IRODAs identify the Portneuf River TMDL: Waterbody Assessment and Total Maximum Daily Load and Addendum (IDEQ, 2001) as a "to be considered" (TBC). The TMDL developed loading limits for constituents discharged to the Portneuf River, including the groundwater impacted from releases at the FMC and Simplot OUs. The TMDL was revised and amended in 2010. The TMDL endpoints will be considered in developing EPA-approved risk-based surface and groundwater cleanup levels for phosphorus pursuant to the Simplot IRODA. This risk based cleanup level, when developed, will be used at both the Simplot and FMC OUs.

Soil ARARs
No ARARs have been identified for soil COC's at the Site. However, the Tribes have promulgated soil cleanup standards (SCS) for contaminated properties as regulations under their Waste Management Act. On December 3, 2010, the Tribes sent a letter to EPA requesting that these standards be designated as ARARs for the FMC OU. As stated in the FMC IRODA, when a final remedy is implemented, any additional ARARS, including the Tribes' Soil Cleanup Standards (to the extent the SCS are determined to be ARARs), are to be fully complied with unless a formal waiver is invoked at or before the completion of the remedial actions.

Institutional Control Review

As remedy design and implementation continues at all three OUs, institutional controls will continue to be designed and implemented. Some institutional controls have been implemented at the FMC and Simplot OUs. They are described below.

FMC OU
The March 2014 FMC OU Draft Institutional Control Implementation and Assurance Plan, amended in January 2015, partly addresses the institutional controls called for in the 2012 FMC OU IRODA. The Plan will be implemented once modified and approved by EPA. Institutional controls will be designed to include environmental land use restrictions prohibiting activities that disturb implemented remedies and restrict the use of contaminated groundwater.

In 1995, FMC filed restrictive covenants on property owned by FMC within the FMC OU (except the Batiste Spring). FMC provided the Tribes with information on the deed restrictions filed with Powers and Bannock counties. FMC provides an annual environmental covenant report confirming that the properties with deed restrictions are not being used for unauthorized uses, extraction of groundwater for human consumption or growing fruits and vegetables for human consumption. Copies of deed restrictions currently in place are available in the March 2014 FMC OU Draft Institutional Control Implementation and Assurance Plan.

Table 5 lists the institutional controls associated with areas of interest at the FMC OU. Figure 6 and Table 7 provide details on property parcels of interest to the FMC OU.

Table 5: Institutional Control (IC) Summary Table FMC OU

Area of Interest – FMC OU					
Media	**ICs Needed**	**ICs Called for in the Decision Documents**	**IC Objective**	**Instrument in Place**	**Notes**
Ground water	Yes	Yes	Restrict groundwater use to prevent human consumption of impacted groundwater	None	To be established in accordance with approved ICIAP as required by 2013 UAO.
Soil	Yes	Yes	Restrict FMC OU to industrial or commercial uses and prevent any activities that would jeopardize the remedy components	Some restrictive covenants that restrict land use to industrial or commercial	Additional ICs are needed to prohibit activities that may damage or disturb the remedy components and as needed to satisfy IRODA and 2013 UAO requirements.

Simplot OU

Simplot provided a draft institutional control plan to EPA in June 2003 for the Simplot OU. The draft plan describes the institutional control program based on the 1998 ROD and the 2002 Consent Decree. The institutional control plan includes five components:

- Preparation of a worker information sheet to be used in annual and new worker training to inform workers of potential health hazards associated with the remedial action process at the facility.
- Provision of mitigation measures to control exposure of gypsum stack workers to external gamma radiation.
- Identification of areas where gross alpha levels in soils are above the soil screening level and provision of procedures to require any future office buildings in these areas to be constructed using radon-controlling methods and to be monitored annually for radon in indoor air.
- Implementation of legally enforceable land use controls to prevent ingestion of groundwater with constituent concentrations above Safe Drinking Water Act MCLs.
- Implementation of legally enforceable land use controls to eliminate the possibility of future residential land use of the Simplot OU.

The draft plan did not include any information on prohibiting activities that may damage or disturb the remedy components. A deed notice was filed with both Bannock and Powers counties on August 7, 2002. The deed notice identified the properties are within the Site and subject to the

2002 Consent Decree and the 1998 ROD. A restrictive covenant was filed with both Bannock and Powers counties on May 29, 2003. Copies of deed restrictions currently in place are available in the June 2003 institutional controls plan[3]. Additional institutional controls to protect remedy components will be implemented as remedy design and implementation continues. Table 6 lists the institutional controls associated with areas of interest at the Simplot OU. Figure 6 and Table 7 provide details on property parcels in the Simplot OU.

Table 6: Institutional Control Summary Table Simplot OU

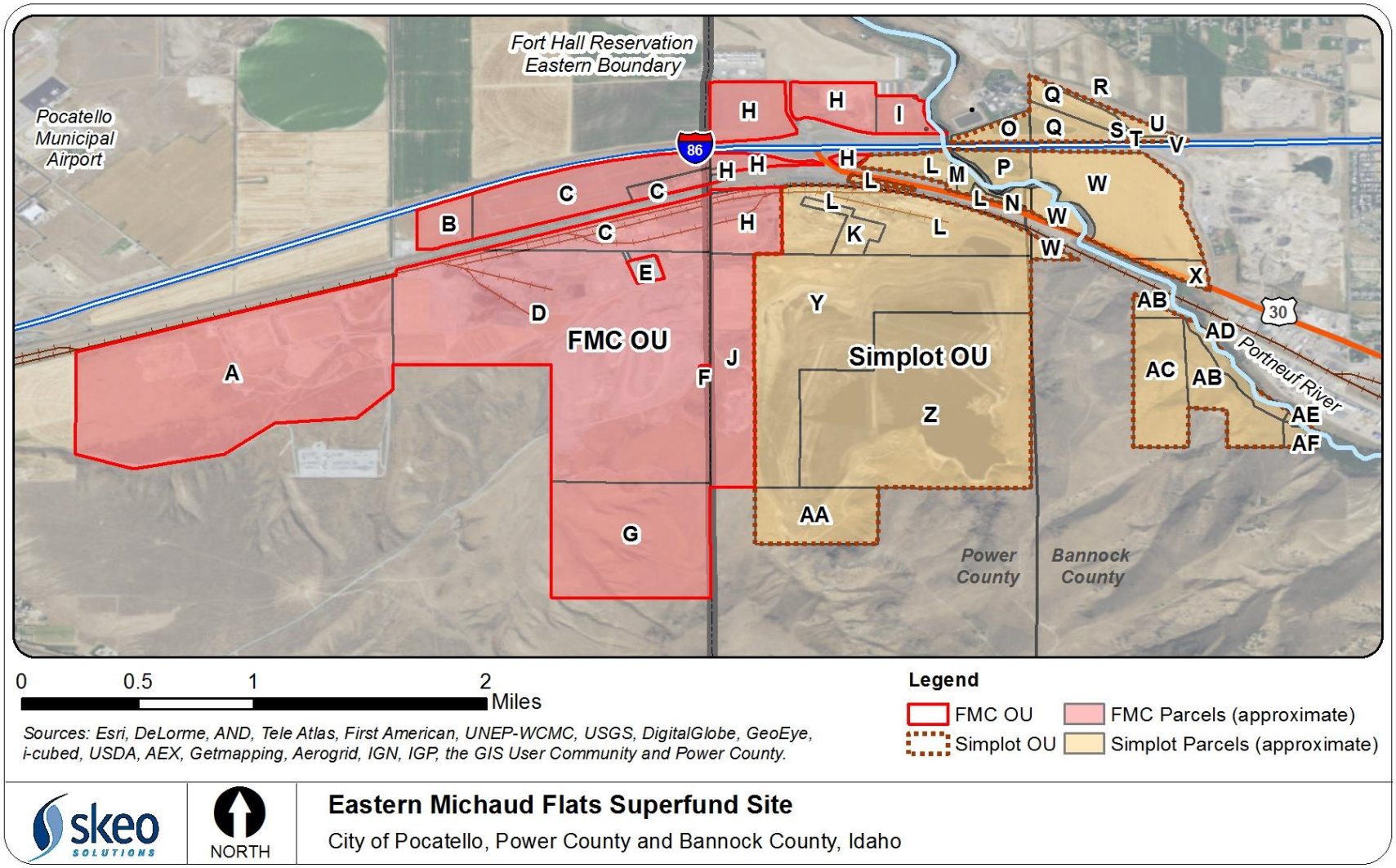
Area of Interest – Simplot OU					
Media	**ICs Needed**	**ICs Called for in the Decision Documents**	**IC Objective**	**Instrument in Place**	**Notes**
Ground water	Yes	Yes	Restrict installation of groundwater wells and groundwater use	Restrictive Covenant	
Soil	Yes	Yes	Restrict land use to industrial or commercial and prevent any activities that would jeopardize the remedy components	Restrictive Covenant	Restrictive covenant also requires construction of future office space to use radon controlling methods. Does not restrict disturbance of remedy components.

Off-Plant OU

The 1998 ROD selected institutional controls for areas of the Off-Plant OU where cadmium and radium concentrations exceeded specified risk thresholds. No institutional controls have been implemented to date. As discussed in Section 4.2 above, additional data and information has been compiled by FMC and Simplot to better define the areas requiring controls. EPA is in the process of reviewing this information to determine where institutional controls are needed.

[3] Institutional Controls Program for the Simplot Plant Area Eastern Michaud Flats Superfund Site. J.R. Simplot Company. June 2003.

Figure 6: Institutional Control Base Map
(See Table 7 for a description of alphabetical descriptions)



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Table 7: Property Parcel Information

Map Identification	Parcel Number	Owner
A	RPD0294-00	FMC Corporation
B	RPD0284-01	FMC Corporation
C	RPD0286-00	FMC Corporation
D	RPD0288-00	FMC Corporation
E	RPD0291-00	Idaho Power Co.
F	RPD0290-00	Northwest Pipeline Corporation
G	RPD0378-00	FMC Corporation
H	RPD0406-00	FMC Corporation
I	RPD0410-00	FMC Corporation
J	RPD0417-00	FMC Corporation
K	RPD0409-00	Simplot Industries Inc.
L	RPD0408-00	Simplot J.R. Company
M	RPD0412-00	Simplot Leasing Corp.
N	RPD0413-00	Ruby Company
O	R3853009502	Simplot Industries Inc.
P	R3853009503	Simplot Industries Inc.
Q	R3853010700	J R Simplot Company
R	R3853010600	J R Simplot Company
S	R3853010800	J R Simplot Company
T	R3853010801	J R Simplot Company
U	R3853010400	J R Simplot Company
V	R3853009801	J R Simplot Company
W	R3853014702	Simplot Industries Inc.
X	R3853020401	Simplot Industries Inc.
Y	RPD0415-02	Ruby Company
Z	RPD0416-00	Simplot J.R. Co.
AA	RPD0419-00	Simplot J.R. Co.
AB	R3853020308	J R Simplot Company
AC	R3853019000	J R Simplot Company
AD	R3853020309	J R Simplot Company
AE	RPCPP044845	J R Simplot Company
AF	R3853018703	J R Simplot Company

6.4 Data Review

Overall, remedy design and implementation at the Site continues to focus heavily on source and groundwater remediation at the FMC and Simplot OUs. Monitoring is occurring across the Site. Supplemental groundwater investigations have occurred, as needed, to design, refine and implement the remedies. Additional surface water data was collected as part of the development of the Portneuf River TMDL.

FMC OU

Phosphine Gas Monitoring: In December 2010 (MWH, 2010) FMC collected gas samples from areas of the FMC OU where elemental phosphorus (P4) processing had occurred historically (i.e. areas with a potential to generate phosphine gas (PH3)). While samples were also collected from the closed RCRA-regulated waste management units, the following discussion is limited to the CERCLA areas. The results were to be used in developing the long-term monitoring plan required under the FMC IRODA. The assessment concluded/found the following:

- All of the breathing zone samples at the CERCLA areas were below detection for phosphine gas.
- Phosphine gas was not detected in ambient air during the on-site field work.
- The field sampling methodologies may be appropriate in support of developing the long-term monitoring plan for potential phosphine at the CERCLA remedial areas.

Groundwater Monitoring: FMC currently monitors groundwater pursuant to the Interim CERCLA Groundwater Monitoring Plan approved by the EPA in July 2011. The objective of the interim CERCLA groundwater monitoring program is to collect sufficient data of known quality to, in conjunction with the Calciner Pond remedial action groundwater monitoring program, evaluate potential changes and/or trends in site-related groundwater constituents and to evaluate groundwater conditions on an FMC OU-wide basis. Based on the 2014 data, FMC reported the following.

- Statistically significant decreasing trends were identified at on-plant wells in 2002 through 2014 that were not identified in the 2001 through 2013 data sets, including arsenic and phosphorus at well 134, and potassium at well 145.
- Analyte concentrations in the wells downgradient of the FMC plant are generally lower for most parameters (and pH higher) and in a narrower range than the on-plant site wells.
- Groundwater constituent concentrations in the Northern Perimeter wells remained generally consistent with historic results with site-related constituent concentrations of phosphorus, potassium, arsenic and selenium remaining below background concentrations.

Contaminated groundwater is not being extracted for potable use from any wells within the FMC OU.

Dust Control and Air Monitoring: The EPA-approved March 2015 Revised FMC OU Dust Control and Air Monitoring Plan (DCAMP), requires that TSPs be measured from a combination of fixed and mobile air quality monitors. The TSP readings from each monitor, along with site meteorological data, is displayed continuously in real-time on a website. Weekly and quarterly

data reports summarizing this information are provided concurrently to EPA, IDEQ and the Tribes.

The DCAMP is primarily a dust prevention/suppression plan with an air quality monitoring component. The goal is no visible dust and FMC uses a number of water trucks and other BMPs in an effort to prevent/suppress dust generation. EPA representatives, who are on site during most remedial action construction work, have reported these efforts to be effective.

Based on a review of the available data, it appears that all alarm events occurred during high wind events and were reported as regional dust events, rather than localized episodes associated with specific remediation activities. In addition, forest fires adversely affect regional air quality during the late summer of 2015. Therefore, risks to site workers and the nearby community are being protected from potentially contaminated fugitive dust generated by remedial action construction.

Simplot OU

Groundwater: The June 2010 Groundwater and Surface Water Monitoring Plan requires quarterly monitoring of all network wells as well as monthly and/or weekly sampling of a subset of wells in the Phosphoric Acid Plant Area. All samples are analyzed for six field parameters; five general chemistry measurements including sulfate and total dissolved solids; five dissolved metals; total phosphorus and nitrate. In the Compliance Area, samples are also analyzed for fluoride and an additional 13 dissolved metals. In specific cases, total metals are also analyzed. No radionuclide analysis is currently required under the monitoring plan.

All data is compiled and reported in quarterly and annual reports. In addition, data from the Phosphoric Acid Plant Area is provided in monthly reports. The monitoring plan identifies the analysis to be performed for each set of data and the components to be included in each report. In most cases, data evaluation is limited to arsenic, phosphorus and sulfate. However, pH, conductivity and nitrate data has been further evaluated when appropriate. All data is included in the report appendices and available for additional analysis.

To facilitate evaluation of remedy performance, three groundwater monitoring areas have been established (Figures G-1 through G-3). The first area, the *Don Plant Area,* includes all groundwater south of the northern fenceline and is further subdivided into the Phosphoric Acid Plant (PAP) Area and the Target Capture Zones. Data from the Phosphoric Acid Plant Area is used to evaluate source controls implemented in the plant area. The goal of the analysis performed for the Target Capture Zones is to access performance of the groundwater extraction system. The second monitoring area, the *Assessment Area,* is immediately north/downgradient of the Don Plant. Data from this area is used to access progress towards keeping COCs from migrating into the Off-Plant Area. Finally, data gathered from the springs and the wells closest to the river (*Compliance Area*) are used to evaluate progress towards attainment of final clean-up levels. This data is also used for assessing phosphorus loading to the Portneuf River.

The following summarizes data and evaluations from Simplot's 2014 Annual Report – Groundwater/Surface Water Remedy. For a detailed review of the data see Appendix G of this FYR.

Don Plant Area*:* Data from the Don Plant Area is used to evaluate groundwater trends across the OU. Except as noted below, the 2014 data were generally consistent with historical data. In 2014 groundwater elevations and the spatial distribution of groundwater chemistry data was generally consistent throughout the year. Arsenic and phosphorus concentrations were highest in the Upper Zone near the PAP Area while the highest sulfate concentrations were downgradient of the gypstack in the Target Capture Zone Area. The report stated that elevated phosphorus concentrations downgradient of the PAP Area (e.g. well 419) were influenced by facility source or sources.

Phosphoric Acid Plant Area (in Don Plant Area): The June 2010 Groundwater and Surface Water Monitoring Plan indicates that source control is demonstrated when the concentration of phosphorus in groundwater within or downgradient of the Simplot Phosphoric Acid Plant Area is less than or equal to the upgradient concentration. While, the current trends for the indicator chemicals are generally decreasing, source control has not yet been demonstrated.

Phosphorus concentrations were documented to have increased in the East Plant Area since the initiation of monitoring in 2004. Increasing phosphorus concentrations are reported to be due to the long-term operation of the gypsum stack. However, a decrease in concentrations is expected after lining of the entire gypsum stack is complete.

Total phosphorus concentrations downgradient of the Central Plant Area are reported to be elevated since 2013 as a result of dense, low pH/high total phosphorus concentration liquid diffusing upward from low spots in the surface of the American Falls Lake Bed clay near well 419. The phosphorus liquid is reported to be mixing with groundwater from upgradient of the Simplot Phosphoric Acid Plant Area in the upper zone, and being transported by advection downgradient to the northeast.

Phosphorus concentrations in the PAP Area were significantly higher in all four quarters of 2014 than concentrations reported in 2011 and 2012. The highest concentration was detected in MW-377B at 16,100 mg/L in the first quarter of 2014 (Appendix G, Figure G-4), while the maximum concentration in 2013 was almost 15,000 mg/L and the 2011 and 2012 maximum concentrations were less than 2,500 mg/L. The elevated concentrations downgradient of the Phosphoric Acid Plant (e.g., at well 419) indicate influence of a facility source or sources within the PAP Area and have been further evaluated as part of a supplemental subsurface investigation. In addition, weekly sampling has been initiated at wells where a pH less than 5 has been observed, thus allowing for a more complete data set to evaluate potential sources. The 2014 Annual Report indicates that source control actions in the Simplot Phosphoric Acid Plant Area completed since 2009 have achieved significant reductions in measured phosphorus concentrations in groundwater in the PAP Area.

Plant Area Target Capture Zones (in Don Plant Area): Target Capture Zones are three-dimensional zones where groundwater extraction is focused. The capture zone assessment in the annual report provides estimates of the mass of the key constituents being removed by the extraction system and the mass that bypasses the extraction system. Particle tracking is used to

illustrate the flow captured by the extraction well network and that moving downgradient to the river.

In 2014, the estimated phosphorus load to groundwater attributable to the PAP Area was reported to be 598 pounds per day (lbs/day), an increase from 328 lbs/day in 2013. This represents approximately 31% of the phosphorus load from the OU.

The 2014 monitoring report indicates that modifications to the existing extraction system are needed to reestablish hydraulic control in this area. Hydraulic control was lost when well 419 was shut down in February 2013 due to hazardous-characteristic groundwater. In 2014, Simplot initiated a groundwater extraction and treatment pilot study to assess the efficacy of removal of the subject groundwater. The pilot study also included pump testing to get nearby well 423 back on-line in hopes of reestablishing hydraulic control. Simplot is currently modifying the extraction system to allow for more flexibility in treating hazardous-characteristic groundwater from 419 (or 423) while pumping non-hazardous groundwater continuously from 423 (or 419) for reuse in the facility, without treatment, and to reestablish hydraulic control in this area. Simplot is also evaluating how groundwater extraction from existing wells downgradient of the gypsum stack can be optimized to further reduce phosphorus concentrations in groundwater and surface water in the short term.

Assessment Area: The Assessment Area monitoring wells are in a line just north of Highway 30 and evaluate the effectiveness of the source and hydraulic control remedies in reducing the extent and concentration of COCs downgradient of the plant areas. The general spatial distribution of arsenic, phosphorus, and sulfate in the Assessment Area did not change between 2013 and 2014. Generally, arsenic, phosphorus, and sulfate concentrations decrease to the north in the Assessment Area, with concentrations typically higher in the shallower intervals. Simplot identified elevated phosphorus concentrations of 610 mg/L at well 532B due to transport from the well 419 area. Arsenic concentrations were above the MCL of 0.010 mg/L at wells 503, 518, 526, 528AR, 529BR, 530A/B, 531A/B, 532A/B, 533A/B, 535A/B, 536A/B and 540A/B. In 2014, phosphorus concentrations ranged from 0.01 mg/L at wells 519, 532C, 533C and 536C to 610 mg/L at well 532B.

Compliance Area: The Compliance Area is comprised of a series of wells located near the Portneuf River. Samples are also collected from Batiste Spring and the Spring at Batiste Road. The data are compared to the MCLs or RBCs to determine if RAOs and groundwater cleanup levels are being attained. In 2014, arsenic and vanadium in several wells exceeded the MCL and/or RBC. Thus, RAOs have not currently been attained. The 95% UCL for arsenic ranged from 0.003 to 0.025 mg/L as compared to a MCL of 0.01 mg/L. The UCL of total phosphorus ranged from 0.03 to 11 mg/L. The total phosphorus UCLs were highest in wells 537A (7.3 mg/L), 538A (10.98 mg/L), 539B (4.1 mg/L) and the Batiste Springs (2.9 mg/L).

Surface Water: The Portneuf River is monitored at four locations, including at Siphon Road. Phosphorus loads to the river were reported to decrease between 2007 and 2010, remain relatively constant from 2011 to 2013 and increase during 2014. In the annual report, Simplot attributes the decreased phosphorus concentrations to a reduction of the phosphorus load from Simplot OU groundwater and the recent increase to the loss of hydraulic control in the vicinity of

well 419 in the PAP Area. Based on assumptions identified in the annual report, Simplot predicted that phosphorus loading to the river from the PAP Area is expected to peak around the end of 2015. Loading from the overall site, however, was not predicted to change significantly between 2014 and 2015 due to reduced loading from the gypsum stack.

The Portneuf River TMDL established target concentrations of 0.07 mg/l (low flow) and 0.125 mg/l (high flow). The 12-month rolling median phosphorus concentration is used to define progress towards attainment of the TMDL goal. As of December 2014, the 12-month median concentration was 0.47 mg/l and represented a 62% reduction from the 2008 baseline value of 1.25 mg/l. A state Voluntary Consent Order/Compliance Agreement identified a target concentration of 0.625 (50% reduction) to be achieved by 2013, a concentration of 0.312 mg/l (75% reduction) to be achieved by 2015 and a concentration of 0.075 mg/l (94% reduction) to be achieved by December 31, 2021.

Phosphorus levels in the Portneuf River contributed to excessive green algal growth and associated reductions in dissolved oxygen (DO). The State of Idaho water quality standards set a minimum DO criterion of 6.0 mg/l to protect the designated beneficial use of cold water aquatic life in the Portneuf River.

Simplot has tracked the number of days each year where the minimum DO level was under 6.0 (i.e. did not meet the water quality criterion). This number has varied significantly from year to year but has increased each of the last 3 years. In 2014 the standard was not met on 125 days as compared to 82 days in 2010. In the annual report, Simplot suggests that while the phosphorus load has decreased, phosphorus concentrations have remained fairly steady due to decreased flows.

Overall, source control at the Simplot OU appears to be reducing the phosphorus load to the Portneuf River. However, additional source control is needed to meaningfully reduce the risks to the ecological community living in the river and to meet RAOs for the Site.

Off Plant OU

Surface soil: In order to review and update the findings of the RI in areas targeted for institutional controls due to elevated radium-226 soil levels, in 2009, FMC and Simplot collected soil samples from the Off-Plant OU. Samples were analyzed for radium-226 and the results used to evaluate potential risks from radionuclides in the Off-Plant OU (MWH, 2010). The 2010 report concluded that no further investigation of radionuclide surface soil levels is necessary in the Off-Plant OU because the soils pose risks that are below a level of human health concern for future residents and workers.

In early 2010 FMC and Simplot analyzed soil samples collected from the Off-Plant OU for cadmium. This analysis was conducted to help address outstanding concerns related to cadmium exposure from the homegrown produce ingestion pathway, Additional sampling of cadmium in produce from a garden immediately north of the FMC OU was also conducted. The data and analysis was presented in an April 2011 letter report provided as an addendum to the 2010 radionuclide report. The report summarized the human health risk assessment methodologies and findings for the Off-Plant OU. The results indicated that the total cancer risk were within EPA's risk management range of 1 x 10-6 to 1 x 10-4 and the noncancer risks were below the EPA's

noncancer hazard index of 1.0. Based on these results, FMC and Simplot recommended that that no further investigation of radionuclide, metal or fluoride soil levels was necessary in the Off-Plant OU. EPA has yet to make a determination as to whether or where institutional controls are required to be implemented under the 1998 ROD.

As part of the re-evaluation of risks due to exposure to fluoride, EPA evaluated risks to grazing livestock/cattle. EPA used thresholds for the effect of dental fluorosis in cattle based on fluoride concentrations in vegetation and soil as an effects benchmarks to assess risks to large grazing mammals. Dental fluorosis is recognized as the most sensitive endpoint of concern for exposure of livestock to dietary sources of fluoride. Thus, the degree of dental fluorosis is used as an early indicator of potential adverse health effects from fluoride exposure. Results of a comparison of Off-Plant OU forage data with the thresholds developed indicate that, at several exposure units, risks to grazing mammals from fluorosis exceed EPA's non-cancer hazard index of 1.0. EPA has yet to make a determination as to whether additional actions are required by the ROD to address the risks to grazing mammals from fluorosis.

Groundwater/Surface Water: Groundwater that flows north from the Simplot and FMC OUs discharges to the Portneuf River and several springs adjacent to the Portneuf River. Groundwater in this area is monitored as part of the Simplot and FMC OUs. Surface water is monitored as part of the Simplot monitoring program. (See above discussions for more detail)

6.5 Site Inspection

The site inspection for the FMC OU occurred on March 11, 2015. Parties in attendance for the FMC OU site inspection included: Jannine Jennings (EPA), Jonathan Williams (EPA), James Zokan (EPA), Bernie Zavala (EPA), Doug Tanner (IDEQ), Paul Ritter (IDEQ), Scott Miller (IDEQ), Wayne Crowther (IDEQ), Marjo Carpenter (FMC), Rob Hartman (MWH/FMC – contractor for FMC), Greg Cunningham (Parsons – contractor for FMC), Kelly Wright (Shoshone-Bannock Tribes), Susan Hanson (technical consultant to the Shoshone-Bannock Tribes), Treat Suomi (Skeo Solutions – contractor for EPA) and Emily Chi (Skeo Solutions – contractor for EPA).

The group first received a safety briefing and summary of recent site activities. The participants toured the FMC OU to observe the condition of all remedial components, including site fencing, monitoring wells, re-grading activities, and Calciner Ponds. The group observed different remediation areas, including some areas that were part of the 2014 site-wide regrading activities. The group also observed and walked on the vegetated cap of Calciner Pond 5C and saw the area that will receive the evapotranspiration and soil gamma caps in the future. The group observed the fence separating the RCRA ponds from the FMC OU and drove through the RCRA pond area to observe the various ponds.

The FMC OU was well-maintained overall. Fencing surrounds the entire FMC property. High security-type fencing restricts access from road areas and there is a security officer monitoring entry into the Former Operations Area. The fencing between the FMC OU and the Simplot OU, and fencing to the south and southwest of the FMC OU is ranch-style fencing. Part of the fencing in the area south and southwest of the FMC OU has been previously breached by cattle. There

are signs that indicate the property is private, but there are no signs notifying potential trespassers that this is a Superfund site. Monitoring wells were secure and in good shape.

The site inspection for the Northern Properties of the FMC OU occurred on March 12, 2015. Because all contamination has been removed, the Northern Properties were not secured with fencing and all observed monitoring wells were secured and locked (Figure 3). Participants also observed the surface water sampling location for Batiste Springs.

The site inspection for the Simplot OU occurred on March 12, 2015. Parties in attendance for the Simplot site inspection included: Jannine Jennings (EPA), Jonathan Williams (EPA), James Zokan (EPA), Bernie Zavala (EPA), Margie English (IDEQ), Andy Koulermos (Formation – contractor for Simplot), Kirk Adkins (Simplot), Mark Waddoups (Simplot), Monty Johnson (Simplot), Kelly Wright (Shoshone-Bannock Tribes), Susan Hanson (technical consultant to the Shoshone-Bannock Tribes), Treat Suomi (Skeo Solutions – contractor for EPA) and Emily Chi (Skeo Solutions – contractor for EPA).

All participants met at the Simplot office to discuss site activities. The participants drove to the Simplot Don Plant security office at the active operations area to check in, receive visitor badges and watch a safety video. Afterward, participants toured the Simplot OU to observe the condition of all remedial components, including site fencing, monitoring wells, the multiple phases of source control at the gypstack, Phosphoric Acid Plant Area source control efforts, and the pilot treatability system. The group drove up onto the gypstack on the gypstack roads to observe Decant Pond 1, settlement monuments, piezometers, and the different phases of source control. The group also visited the current operations area to observe components of the extraction system, sumps, and recently-installed aboveground tank and foundation upgrades with leak detection systems. Finally, the participants toured the pilot treatability study area to observe the pilot groundwater treatment system.

The Simplot OU was well-maintained overall. The Simplot Don Plant is a secure plant with restricted access and operates 24 hours a day, 365 days a year.

Following the Simplot OU tour, participants visited the Northern Properties of the FMC OU and Off-Plant OU Areas. Participants observed the surface water monitoring site on the Siphon Road Bridge. All observed monitoring wells were locked.

The complete site inspection checklist is available in Appendix D. Photographs from the site inspection are available in Appendix E.

On March 11, 2015, Skeo Solutions staff visited the designated site repositories as part of the site inspection. The American Falls Library had limited documents up to 2011, and a representative requested that EPA provide the administrative record on computer disc. At the Idaho State University Library, site documents were fairly complete, but only available up to 2012. The Shoshone-Bannock Library had limited site documents available up to 2010.

6.6 Interviews

The FYR process included interviews with parties affected by the Site and regulatory agencies involved in site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. The interviews are summarized below. Appendix C provides the complete interview forms.

Shoshone-Bannock Tribes: Skeo Solutions, along with EPA, interviewed tribal representatives from the Shoshone-Bannock Tribes on March 12, 2015. The Shoshone-Bannock tribal representatives who participated in the interview included Policy Commissioners and representatives from Environmental Waste Management Program.

The representatives are concerned about the impacts to their homeland from contamination at the Site. They are specifically concerned about groundwater contamination that continues to flow into the Portneuf River and into the Fort Hall Bottoms. In the Off-Plant OU, they are concerned that continued emissions from the Simplot plant result in elevated level of fluoride on nearby grazing lands and contaminants being deposited on food grown crops. The representatives discussed at length the inadequate monitoring program for groundwater and surface water, in particular the lack of testing radiological constituents that, they say, are present and likely impacting Tribal resources.

As for the FMC OU, there was much discussion surrounding the lack of phosphine gas monitoring at the FMC OU workers to phosphate (P205) multiple times a day, and the spreading of the slag over the entire site. Representatives also indicated that a major continuing concern is the lack of recognition of Tribal regulations and that those regulations not being applied at the Site.

The representatives feel that the cleanup at the Site is employment-driven, and that the biggest issue at the Site is that the surrounding communities are not working together. The Tribal representatives feel that FMC is steering the surrounding communities and dividing them up so that they will not work with each other. They indicated that they were heading into a drought year and that contamination could seep into American Falls Reservoir. The representatives do not feel comfortable using their water resources due to the contamination.

A major complaint of the tribal representatives was smoke coming off of the stacks at the facility[4]. The tribal representatives claim the smoke is causing health problems for those with immune issues. The representatives reported that they know of one person that got mercury poisoning from eating fish, many of which are deformed[5]. Cattle no longer graze along the northeast side of the Simplot OU, and people do not bathe in Batiste Springs any longer.

The tribal representatives do not feel like they have been treated fairly. They said that when the FMC facility first began operations, the Tribes sold ore to FMC for $5 per pound and FMC then made millions while the Tribes were only left with the waste. The representatives indicated that

[4] EPA reviewed this comment and found that this was likely dust instead of smoke.
[5] No data has been provided to support this statement and mercury is not a contaminant of concern at the Site.

the Tribes wish to install air monitors but claim they are not allowed to because of unknown parameters. The Tribes have limited access to areas where they once used to live, and are not allowed on certain areas without an EPA escort. The representatives also feel that institutional controls and other official documents should be filed with Tribal offices.

Other concerns of the representatives include a lack of institutional controls for drinking water wells a lack of sampling of residential wells downgradient from the Site, EPA not applying the Tribes' soil cleanup standards, and phosphine in the soil negatively reacting to storm fronts and pressure[6]. The representatives indicated that the Tribes are also concerned about the 22 railcars buried in the slag area at the FMC OU, and that EPA is not addressing them. The representatives feel that the drilling of more extraction wells will allow contaminants to reach the aquifer, and that more information is needed before drilling any more holes.

Marguerite Carpenter (FMC OU): Marguerite Carpenter represents FMC as the PRP at the FMC OU. She stated that the remedies are performing consistently with EPA-approved design plans. The site-wide grading phase of the soil remedial action is in progress, but the groundwater remedial action is still in the design phase and construction has not commenced. She indicated that the remedy implementation at the FMC OU has not negatively affected the surrounding community, rather it has resulted in the creation of approximately 35 local jobs. She feels that actions are progressing well, but there is no completed remedy to manage or operate at this time.

Mark Smith (FMC OU): Mark Smith represents Kase-Warbonnet, Inc. as a remedial action contractor at the FMC OU. He stated that the site-wide grading phase of the soil remedial action is in progress, but remedial design for the soil covers and groundwater extraction and treatment system is still ongoing. He indicated that there is a continuous presence at the Site relating to the RCRA waste management unit closure, CERCLA removal action and the Calciner Ponds remedial action and post-remedial action. He also said that as remedy design and implementation continues, there are no current remedial action O&M activities.

Andrew Koulermos (Simplot OU): Andrew Koulermos represents Formation Environmental as the O&M contractor at the Simplot OU. Koulermos stated that the remedy is unique, allowing the Simplot Don Plant industrial facility to remain in operation while still providing long-term protection for the environment. The ground/surface water remedy is performing as predicted and is reducing COC concentrations in the ground and surface water. The focus of monitoring data at the Site is phosphorous concentrations in the Portneuf River, which have been significantly reduced as a result of implementing lining at the facility's gypsum stack. The lining project is expected to be completed in 2016, and is designed to reduce seepage of process water to less than a gallon per minute. Koulermos stated that there have been no significant changes, unexpected difficulties or costs relating to O&M in the past five years. He feels that the groundwater monitoring wells that are downgradient of the gypsum stack can now be monitored semi-annually, rather than quarterly.

Monty Johnson (Simplot OU): Monty Johnson represents the JR Simplot Company as the PRP at the Simplot OU. Johnson stated that the remedy has reduced levels of arsenic and phosphorous in groundwater and the Portneuf River. He feels that the remedy has had positive effects, both in

[6] EPA is not aware of any drinking water wells within the contaminated groundwater plumes,

reducing contaminants and demonstrating the company's commitment to sustainable industry. The community has been receptive to the remedy and expressed appreciation for the remediation efforts. The local Shoshone-Bannock Tribes have at times voiced criticism of remediation methods and schedules.

Johnson feels that CERCLA regulations should not apply to the operation of an industrial facility, and that a consistent differentiation must be maintained between Superfund requirements and facility operations. In particular, EPA has set goals of gamma radiation exposure to gypsum stack workers three orders of magnitude lower than Occupational Safety and Health Administration standards. Other industrial facilities in the country do not have to meet this standard. Johnson also stated that elements of work outlined in the Consent Decree have been completed, but EPA has not approved the Remedial Action Certification Reports. Simplot requests that EPA review the work and approve those remedial actions where work has been completed.

Margie English, Scott Miller and Doug Tanner (IDEQ): English, Miller and Tanner from IDEQ completed an interview form by email for the Simplot and FMC OUs:

FMC OU: The state representatives stated that issues came up that caused remedial work to be delayed. However, the preparation of contaminated areas for the cap and cover systems appear to be moving at a reasonable pace. IDEQ is aware of numerous complaints by tribal residents about site activities and dust emissions. The representatives stated that IDEQ has visited the site multiple times to inspect the conditions of the Site and to check the progress of grading/remedial activities. They stated that IDEQ is comfortable with institutional controls in place and are not aware of any changes in projected land use, and that RPM, Jonathan Williams, is effective and keeping the project moving and addressing concerns.

Simplot OU: The state representatives feel that the project is making reasonable progress but some parts are not moving as quickly as they would like. They stated it would take several years for the lining of the gypstack to be fully effective at reducing phosphorous in the Portneuf River. The state had been made aware of several complaints from the Shoshone-Bannock Tribes. IDEQ continues to implement the 2008 Voluntary Consent Order/Compliance Agreement in conjunction with the CERCLA activities so that the water quality target for phosphorous is achieved. IDEQ is comfortable with the institutional controls in place and are not aware of any changes in projected land use. They also commented that RPM, Jannine Jennings, is doing a great job and is a pleasure to work with.

Residential Interviews:
During the two public information sessions many residents talked with EPA and Skeo Solutions about their perspectives on the Site. Two residents participated in more formal interviews. Their complete interview forms are available in Appendix C. Most of the questions and concerns were regarding activities related to current plant operations at the Simplot OU. There were also many concerns voiced about ensuring the safety of the Portneuf River and phosphorous loading. Several residents and community members expressed concerns regarding the safety of gathering plants in the Bottoms Area. Residents also expressed concerns about fugitive dust from remedial

activities at the FMC OU. There was a fair amount of confusion regarding the different governmental agencies involved at the Site, the RCRA ponds, and the current plant operations.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

FMC OU

While the remedies for the FMC OU are expected to function as intended by the 2012 FMC OU IRODA once complete, ecological risks to the Portneuf River are not currently under control. In the interim, human health exposures at the FMC OU are being controlled.

Institutional and engineering controls restrict access to the FMC OU and land use is limited to industrial and commercial purposes. Remedy design and construction are ongoing, an interim groundwater monitoring plan and a dust control and air monitoring plan are in place, and there are currently no known wells used for human consumption of groundwater within the vicinity of the contaminated groundwater.

Soil Remedy: Remedial design for the soil portion of the remedy began after EPA issued a Unilateral Administrative Order (UAO) for Remedial Design/Remedial Action (RD/RA) in June 2013 and is expected to be complete in the fall of 2015. Remedial action construction began in September 2014 with grading of the site to prepare for soil capping. The grading phase of work is scheduled to be complete in September 2015 followed by installation of evapotranspiration (ET) and gamma caps. The ET soil caps will minimize percolation of precipitation below the root zone through areas of buried elemental phosphorous and also provide shielding from gamma radiation in soil beneath the ET caps. The gamma soil caps will shield those on site from gamma radiation emitted by slag beneath the caps. Construction of the ET and gamma caps is expected to be completed in late 2015 or early 2016.

Remedial action construction is being conducted under an EPA-approved Dust Control and Air Monitoring Plan (DCAMP) designed to minimize/suppress dust, and monitor TSPs in remedial construction areas and along the FMC OU boundaries. EPA representatives are onsite during most remedial action construction work, and real-time weather and particulate monitoring data are available for viewing on an internet website. EPA observations and review of the data collected by FMC under the DCAMP indicate that site workers and off-site residents have not been exposed to unacceptable levels of air-borne contaminants during remedial construction. The exclusion zone where work is being conducted is fenced and access is controlled through gates and a security guard.

Ground Water Remedy: Remedial design work began after EPA issued the 2013 UAO and is expected to continue through 2015. Three pilot test extraction wells were installed in March-April of 2014 and tested to provide information needed for the remedial design. The preliminary groundwater extraction and treatment system design was submitted to EPA in January 2015. FMC is developing an intermediate design, responsive to EPA comments, to be submitted in October 2015. Upon approval of the final design, FMC will begin implementing the groundwater remedial action. The system will extract and treat contaminated groundwater to

prevent it from migrating beyond the FMC OU. Extracted groundwater will be treated to meeting drinking water standards and/or risk based cleanup levels as required by the IRODA.

Groundwater is currently being monitored under an Interim Groundwater Monitoring Plan and will continue until succeeded by the Remedial Action Long-Term Groundwater Monitoring Plan. There are currently no known wells used for human consumption of groundwater within the plume of contaminated groundwater.

Tribal trust lands adjacent to the southern and southwestern boundary of the FMC OU are used for hunting and gathering. Livestock also graze on these adjacent Tribal trust lands. Access to the FMC OU is controlled by a three-string barbed wire fence which has been breached by cattle. To ensure access to the FMC OU from these adjacent tribal trust lands is controlled, EPA has directed FMC to repair the fence where needed and to provide adequate signage on the fenceline warning trespassers of potential risks.

Simplot OU

While the remedies for the Simplot OU are expected to function as intended by the 1998 ROD as supplemented by the 2010 Simplot OU IRODA once complete, ecological risks to the Portneuf River are not currently under control. Human health risks at the Simplot OU are being controlled by ongoing remedial activities and existing institutional controls.

Remedy implementation continues at the Simplot OU. Construction Completion Reports have been submitted for three remedial actions identified to address risks from soil and air sources. O&M is ongoing for the Gypstack Roads remedial action and has included two major reconstruction projects to address changes made during the Gypstack Lining Project.

The groundwater extraction system is operating and was certified as operable and functional in 2012. Monitoring results are being used to optimize performance of the system and target additional control actions. Simplot has identified a low pH/high phosphorus pool in the vicinity of well 419. Work is ongoing to identify how to extract and properly treat or dispose of the water that displays RCRA hazardous waste characteristics. Simplot has constructed a temporary pilot treatment system and has operated the system since February 2014 to test extraction and treatment methods applicable to this plume. In order to ensure future protectiveness, the hazardous characteristic waste must be removed and containment of the dissolved plume be reestablished. This may require implementation of additional response actions.

A draft Phosphorus Source Control Plan is being implemented by Simplot. The plan identifies potential sources in the Phosphoric Acid Plant Area, procedures for inspecting plant infrastructure for leaks, and a process to be implemented if groundwater monitoring data indicate a potential release from the plant. Source control measures in the Phosphoric Acid Plant Area have included upgrades to tanks, sumps and pads that are exposed to the liquid phosphoric acid. To ensure future protectiveness, pursuant to the Consent Decree Simplot will continue to perform regular inspections and upgrade infrastructure so that contaminants do not enter the ground and groundwater.

Phases 1 thru 4 of the Gypstack Lining Project have been completed. The lateral expansion at the northwest corner of the existing gypsum stack (Phase 6) will be completed in 2015. The final compartment on the east side of the upper east compartment (Phase 5) is scheduled to be lined in 2016. Completion of the project will significantly reduce the contaminant load moving from the gypstack to the groundwater and surface water.

Covenants that restrict land use to industrial or commercial have been implemented at the Simplot OU. The active facility is fenced, access is restricted and security guards are present 24 hours every day. Additional institutional controls to protect remedy components will be implemented as remedy design and implementation continue.

Off-Plant OU

The remedies selected in the 1998 ROD for the Off-Plant OU have not been implemented and thus, are not functioning as intended by the 1998 ROD. The Agency is evaluating the results of investigations that have been conducted since the ROD was issued to determine where the selected remedies may need to be implemented.

As contemplated by the ROD, the Agency has completed additional site characterization to inform decisions regarding the areas requiring institutional controls or other source control measures. The Agency is currently evaluating the results of these investigations to determine where institutional controls or other source controls may be needed.

Monitoring of the groundwater impacted by FMC and Simplot sources is being conducted as part of the FMC and Simplot OU monitoring plans. Fluoride emissions from the Simplot plant and fluoride levels in vegetation downwind of the FMC and Simplot OUs are being monitored by Simplot under a State air permit.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

The cleanup levels for arsenic in groundwater in the 1998 ROD were updated in the FMC and Simplot IRODAs to be consistent with current MCLs. Other exposure assumptions, current and anticipated land use, toxicity data, cleanup levels and RAOs used in the remedies selected for the Simplot and FMC OUs are still valid.

Some of the ecological exposure factors, toxicity values and risk assessment methods used in the 1995 ecological risk assessment for the Off-Plant OU were revised between 1995 and 2010. In 2010, FMC and Simplot reassessed ecological risks in the Off-Plant OU to incorporate the updated information and methods. The results are presented in *Ecological Risk Assessment of Fluoride, Eastern Michaud Flats Superfund Site Offplant Operable Unit* (Formation Environmental, 2010). The 2010 assessment concluded that fluoride concentrations in soils and biota had declined since 1995 and that population level effects for mammals and birds were unlikely for the Off-Plant OU. The results of this study will be used in determining where source controls or other actions are required to be implemented by the 1998 ROD to address excess risks to the environment from fluoride.

The 1995 ecological risk assessment and the 2010 reassessment of ecological risks did not address potential risks to domestic cattle and bison. Since excess fluoride in forage can cause fluorosis in cattle, EPA reviewed available information on risk-based threshold concentrations for fluoride in forage. EPA found that some of the existing data for fluoride in forage exceeded the threshold concentrations. EPA has not yet determined whether further actions are required by the 1998 ROD to address these risks.

In 2011, at the request of the Shoshone-Bannock Tribes, EPA sampled fluoride concentrations in soil and forage in the Fort Hall Bottoms Area.[7] One purpose of the study was to evaluate if tribal members gathering plants from the Bottoms Area may experience higher exposures than represented in the risk assessment. The study found fluoride levels to be similar to both background levels and levels previously measured in the Bottoms Area. As such, the exposure assumptions used remain valid.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no other information at this time that calls into question the protectiveness of the remedies.

[7] Report of Investigation and Sample Results for the Fluoride Sampling in Soil and Vegetation in the Bottoms Area of the Fort Hall Reservation Near the Eastern Michaud Flats Superfund Site, Booz Allen Hamilton, March 8, 2013

8.0 Issues, Recommendations and Follow-up Actions

Table 8 summarizes the current site issues and recommendations.

Table 8: Recommendations to Address Current Site Issues

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Contaminated groundwater plume in PAP Area is not contained.	Develop a plan to remove low pH groundwater and re-establish groundwater containment.	Simplot	EPA	6/30/2016	Yes	Yes
Areas in Off-Plant OU where risks exceed protective levels defined by the 1998 ROD require institutional controls or other actions. These areas have not been defined and remedial actions have not been implemented.	Define the specific areas where institutional controls or other actions are required.	EPA	EPA	6/30/2016	Yes	Yes
Areas in Off-Plant OU where risks exceed protective levels defined by the 1998 ROD require institutional controls or other actions. These areas have not been defined and remedial actions have not been implemented.	Implement the required measures if necessary.	Simplot and FMC	EPA	6/30/2017	Yes	Yes

The following additional items, though not expected to affect protectiveness, warrant additional follow-up:

- Additional community outreach may be needed to further explain the roles and responsibilities of various agencies and programs regulating current operations at the Don Plant.

- To ensure access to the FMC OU from adjacent tribal trust lands is controlled, EPA has directed FMC to repair the fence where needed and to provide adequate signage on the fence-line warning trespassers of potential risks.

9.0 Protectiveness Statements

FMC OU (OU1)
The interim remedy at FMC OU (OU1) is not protective because ecological exposure pathways that could result in unacceptable risks are not under control. Source control measures must be implemented and the groundwater extraction and treatment system operated until the phosphorus risk-based concentration determined to be protective of ecological receptors in surface water is met. Remedial actions currently being implemented are adequately controlling all human health exposure pathways that could result in unacceptable risks. Remedy design and construction are ongoing, an interim groundwater monitoring plan and a dust control and air monitoring plan are in place, access to the site is controlled, and there are currently no known wells used for human consumption of groundwater within the contaminated groundwater plume.

Simplot OU (OU2)
The remedy at Simplot OU (OU2) is not protective because ecological exposure pathways that could result in unacceptable risks are not under control. Source control measures and groundwater extraction must be operated until the phosphorus risk based concentration determined to be protective of ecological receptors in surface water is met. The groundwater extraction system is operating and source controls are being implemented on the gypstack and in the Phosphoric Acid Plant Area, but levels protective of ecological receptors in surface water have not been achieved. Remedial actions currently being implemented are adequately controlling all human health exposure pathways that could result in unacceptable risks. There are no known wells used for human consumption in the contaminated groundwater plume, a groundwater monitoring plan is in place and site access is control.

Off-Plant OU (OU3)
A protectiveness determination of the remedy at the Off-Plant OU (OU3) cannot be made at this time until further evaluation of available information is conducted. Additional evaluation is needed to delineate the areas where the institutional controls to address human health risks from cadmium and radium contamination in soils may need to be implemented and to determine if additional actions, including source control measures, are needed to address ecological risks from fluoride contamination.

10.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.