

# MEMO

## State of Idaho

### Department of Water Resources

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**Date:** September 1, 2023  
**To:** Mathew Weaver, P. E., Director  
**Through:** Tim Luke, Water Compliance Bureau Chief  
**From:** Chad Hersley, P.G. CH  
**Subject:** Staff Memorandum - summary and evaluation of the Hydrometrics, Inc. (Hydrometrics) petition to create an Area of Drilling Concern.

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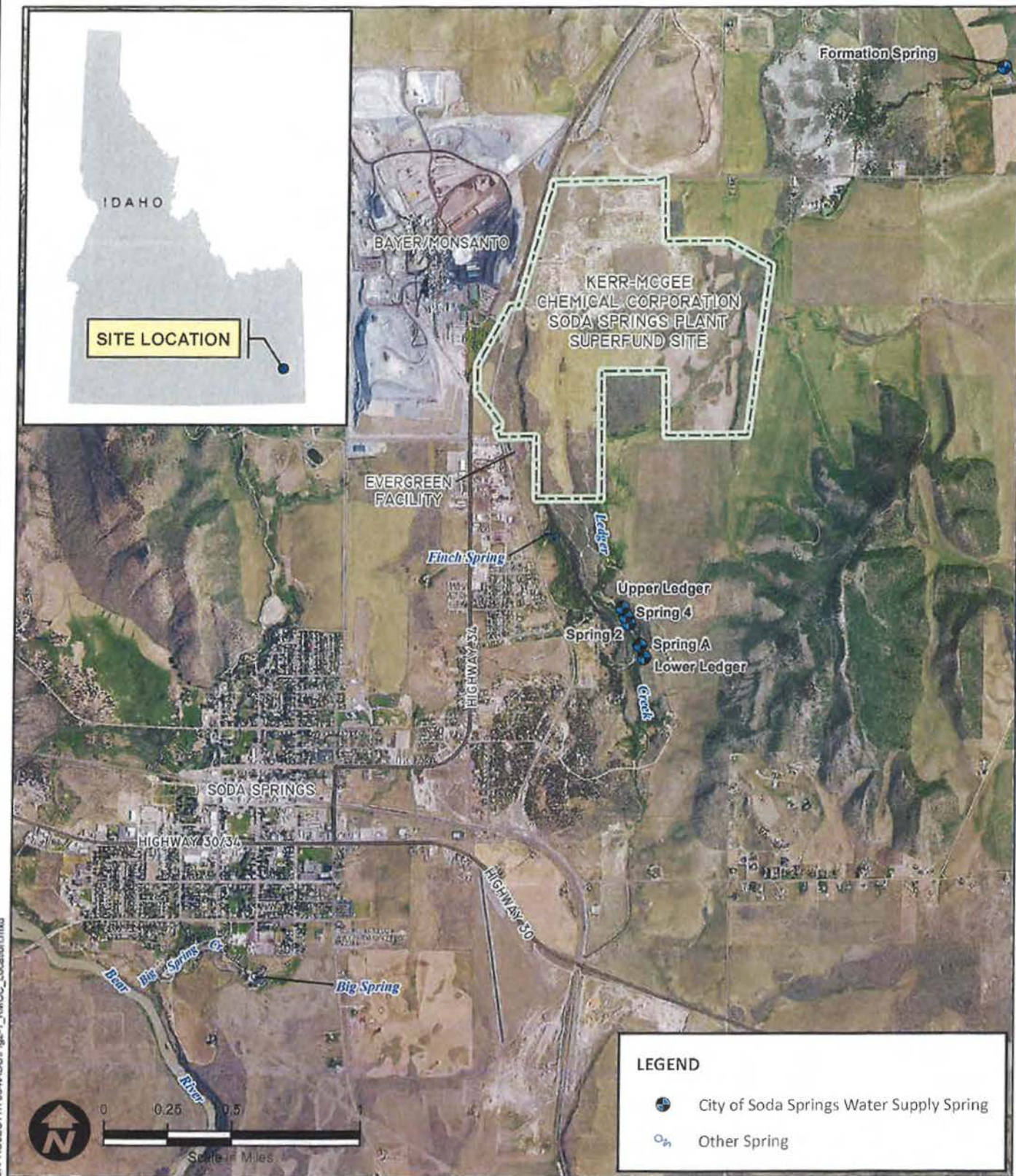
Hydrometrics, on behalf of Greenfield Environmental Multistate Trust petitioned the Idaho Department of Water Resources (“Department”) to designate an Area of Drilling Concern (ADC) near the city of Soda Springs in Caribou County, Idaho pursuant to Idaho Code § 42-238(15). *Petition to Designate an Area of Drilling Concern KMCC Soda Springs Superfund Site Caribou County, Idaho* (“Petition”). The proposed ADC has been identified by the United States Environmental Protection Agency (USEPA) as the most appropriate institutional control (IC) available to address potential off-site risk from exposure to contaminated groundwater resulting from past industrial processes at the site. Long term monitoring of groundwater levels and water quality document south-southwest trending groundwater plumes containing molybdenum and vanadium at concentrations exceeding USEPA tap water regional screening levels (RSL) of 100 ug/L and 86 ug/L respectively. Risk-based project screening levels are 180 ug/L and 260 ug/L respectively. Long term monitoring confirms the vanadium plume extends approximately 1.5 miles south-southwest from the site while the molybdenum plume extends approximately 3 miles south-southwest to the Bear River.

### **Operational and Regulatory History**

Hydrometrics petition to designate an ADC includes a detailed report documenting the operational and regulatory history; and hydrogeologic conditions, of the 547-acre Superfund Site located 1.5 miles north of the city of Soda Springs and east of Highway 34 (Petition Figure 2-1).

Kerr-McGee Chemical Company (KMCC) operated the former chemical manufacturing facility from 1963 to 1999, producing vanadium and fertilizer products from ferrophosphorus (FeP) ore, a smelter slag by-product of refining phosphate. The slag contained elevated concentrations of arsenic, cadmium, chromium, fluoride, manganese, molybdenum, selenium, silver, strontium, tellurium, vanadium, and zinc. Chemical

G:\PROJECT\17034\ADC\Fig2-1\_KMCC\_Location.mxd



PREPARED FOR:



Greenfield Environmental Multistate Trust, LLC  
Trustee of the Multistate Environmental  
Response Trust

PETITION TO DESIGNATE AN  
AREA OF DRILLING CONCERN  
KMCC SODA SPRINGS PLANT  
SUPERFUND SITE

SITE LOCATION MAP

FIGURE

2-1

Hydrometrics, Inc.  
Consulting Scientists and Engineers

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manufacturing continued until 2009, producing fertilizer and cathode materials for lithium-manganese batteries.

Sixteen surface water ponds, lined and unlined, were used for process and storm water management. Unlined ponds and containment failures between 1981 and 1989 released more than 3 million gallons of liquid process water and wastewater resulting in groundwater contamination at the site. The facility was placed on the National Priorities List (NPL) in 1989 under the Comprehensive Environmental Resource Conservation and Recovery Act (CERCLA).

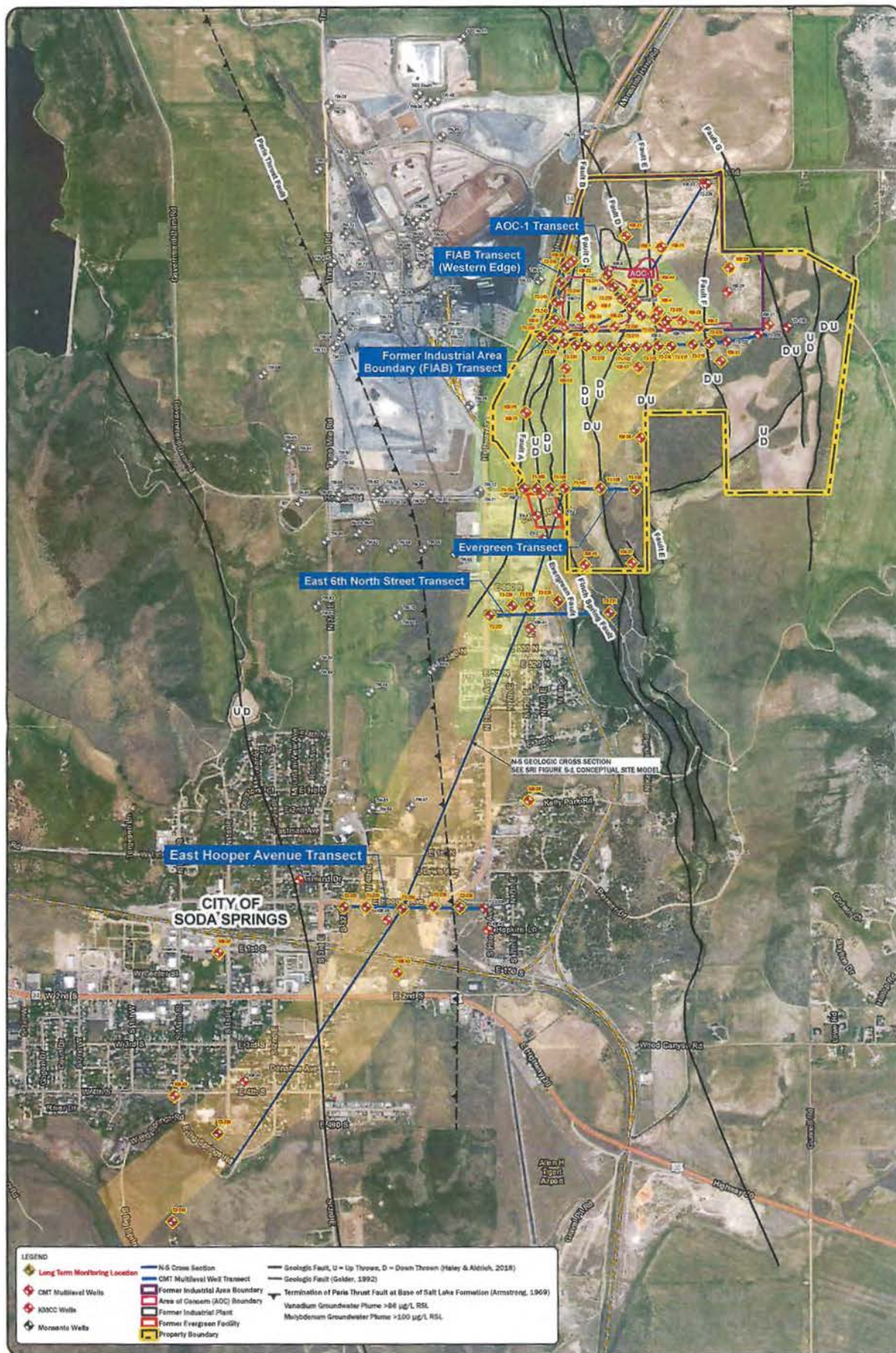
Hydrogeology of the area has been well characterized through past environmental investigations, groundwater monitoring activities, and remediation activities required by USEPA following placement on the NPL (Petition Historical Figure 2). Previous investigations include, but are not limited to:

- 1995 Record of Decision (ROD), Liquid source elimination and recycling calcine tailings.
- 2000 ROD Amendment, change recycling to capping.
- 5-Year Reviews, 2002, 2007, 2012 and 2017
  - 3rd and 4th Reviews: remedy not protective.
  - 3rd and 4th Reviews: off-site ICs recommended.
- Supplemental Remedial Investigations (SRIs) 2015 - 2018
  - Phase I SRI, further characterize site conditions, address remedial action objectives (RAOs) established in the amended ROD, and augment the groundwater monitoring network to better define contaminant Plumes.
  - Phase II SRI - further investigate sources of Site-related contaminants of concern (COCs), expand monitoring well network to better define groundwater gradients, physical and anthropogenic effects on area groundwater, and the extent of contamination, and investigate city of Soda Springs water supply sources for potential Site-related COC impacts.
  - 2018 SRI - further characterize the nature and extent of primary site-related contamination (residual waste) and secondary site-related contamination.
  - 28 monitoring wells installed.
  - 48 Multiport wells (280 ports) installed along six transects for detailed high-resolution lateral and vertical plume characterization.
  - 566 Soil/Rock samples.
  - 351 Groundwater samples.
  - Sampled 23 surface water/springs.

### **Proposed ADC Boundary**

The proposed ADC boundary largely coincides with property lines and existing roads to facilitate physical interpretation of the boundary and to avoid splitting parcels (Petition Figure 5-1). The proposed ADC extends south from the KMCC site through the city of Soda Springs to the Bear River, borders Multistate Trust property, and includes portions of the Bayer/Monsanto property. Except for Bayer/Monsanto property, most of the ADC is within the city limits of Soda Springs. The proposed ADC encompasses approximately





PREPARED FOR:  
GREENFIELD ENVIRONMENTAL  
MULTISTATE TRUST, LLC  
TRUSTEE OF THE MULTISTATE  
ENVIRONMENTAL RESPONSE TRUST



DISPLAYED AS:  
PROJECTION/ZONING: UTM  
DATUM: NAD 83  
UNITS: METERS  
SOURCE: PIONEER

0 750 1,500 3,000  
Feet

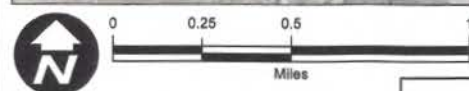
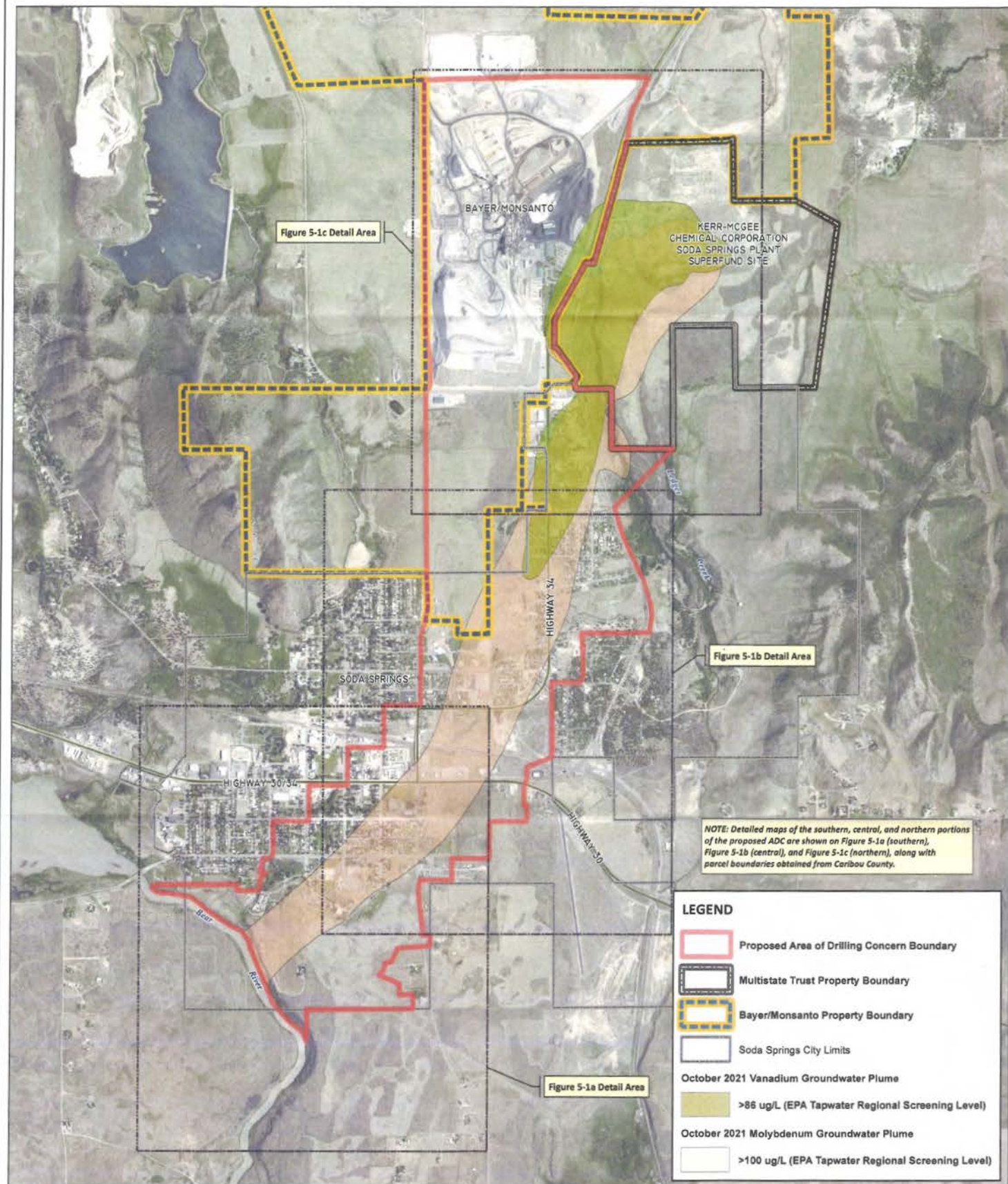


FIGURE 2

**GROUNDWATER  
INVESTIGATION  
LOCATIONS**

DATE: 2022-04-28





1800 acres, including all off-Site areas impacted by the contaminant plumes and a lateral safety buffer of approximately 300 to 1000 feet along plume edges. Off-site plumes are approximately 1400 feet wide.

### **Hydrogeologic Conditions**

Vertical extent of groundwater contamination is variable but past investigations and long-term monitoring indicate it is limited to the Blackfoot Basalt aquifer. The Blackfoot Basalt, the principal water bearing formation in the area, extends from the Blackfoot Reservoir south to the Bear River. Individual basalt flows ranging in thickness from 12 to 52 feet are separated by sedimentary interbeds forming a sequence approximately 230 feet thick. The proposed ADC boundary extends through the full thickness of the basalt aquifer.

Depth to groundwater within the Blackfoot Basalt varies with topography, ranging from 25 to 65 feet below ground surface (bgs) at the former industrial site, deepening to the south to approximately 80 feet bgs. The water table potentiometric surface (2015 LTM report Figure 5) suggests groundwater flows in a westerly direction however, mapping of the contaminant plumes indicates groundwater flows south-southwest. The observed flow direction (SRI Figure 3-10) is attributed to regional faulting and vertical fractures and columnar jointing within the basalt flows.

Blackfoot Basalt is unconformably underlain by the Salt Lake Formation, consisting of tuffaceous sandstone, conglomerate, and limestone. Thickness of the Salt Lake Formation in the vicinity of the KMCC site is unknown but sampling results indicate it is unaffected by contamination found in the overlying basalt aquifer.

### **Existing Wells and Water Supply**

Hydrometrics identified 103 monitoring wells, 4 domestic wells, and 1 “other” well within the proposed ADC boundary (Petition Figure 5-2). Two domestic wells within the ADC boundary have previously been sampled and exhibited concentrations of site related COCs below USEPA RSL. Designation of an ADC will not impact the use of existing wells.

The city of Soda Springs water service area overlaps most of the proposed ADC, except for the area to the south near the Bear River and the Bayer/Monsanto property to the north (Petition figure 5-3). The city drinking water system receives input from six springs: Formation Spring, Spring A, Lower ledger, spring 2, Spring 4, and Upper Ledger (Petition Figure 2-1). Long term monitoring results have shown that concentrations of site related COCs in the springs used for city drinking water supply are below regulatory standards and health advisory levels.

### **Proposed ADC Restrictions**

The petition to designate an ADC proposes the following restrictions:

- Prior to commencing any well drilling activity (including abandonment of an existing well), an application for drilling permit shall be submitted to IDWR. The





Aerial Imagery Source: Aero Graphics Inc. (2015)

**LEGEND**

- PROPERTY BOUNDARY
- + MONITORING WELL SAMPLED IN 2015 WITH GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- GROUNDWATER CONTOUR - 5' INTERVAL
- INTERPRETED DIRECTION OF GROUNDWATER FLOW
- KM MONITORING WELL (KERR-MCGEE)

NOTE:  
THIS FIGURE PROVIDES ONE INTERPRETATION OF GROUNDWATER FLOW.  
OTHER INTERPRETATIONS ARE POSSIBLE.



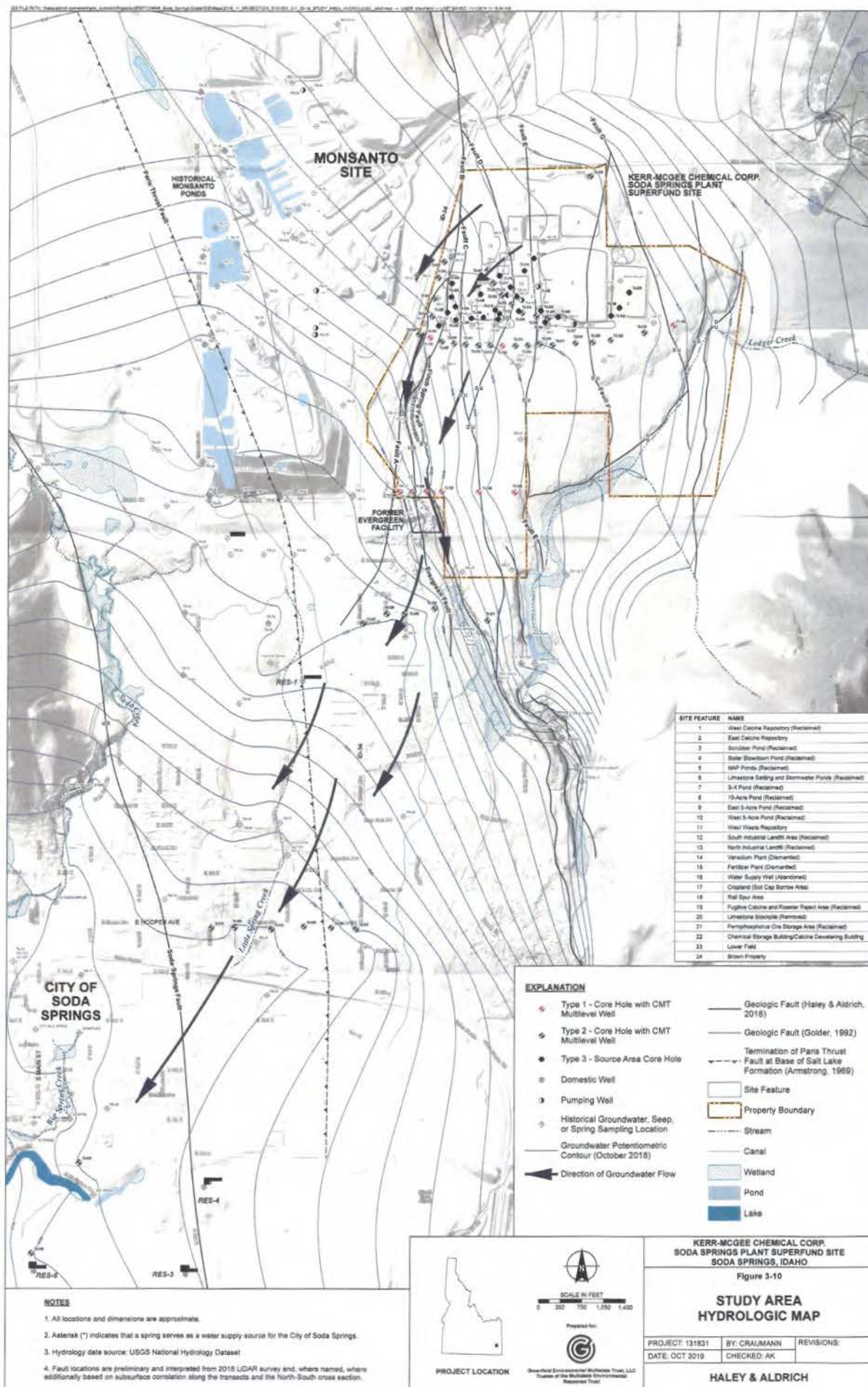
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Former Tronox/Kerr-McGee Chemical Corporation  
Superfund Site, Soda Springs, Idaho

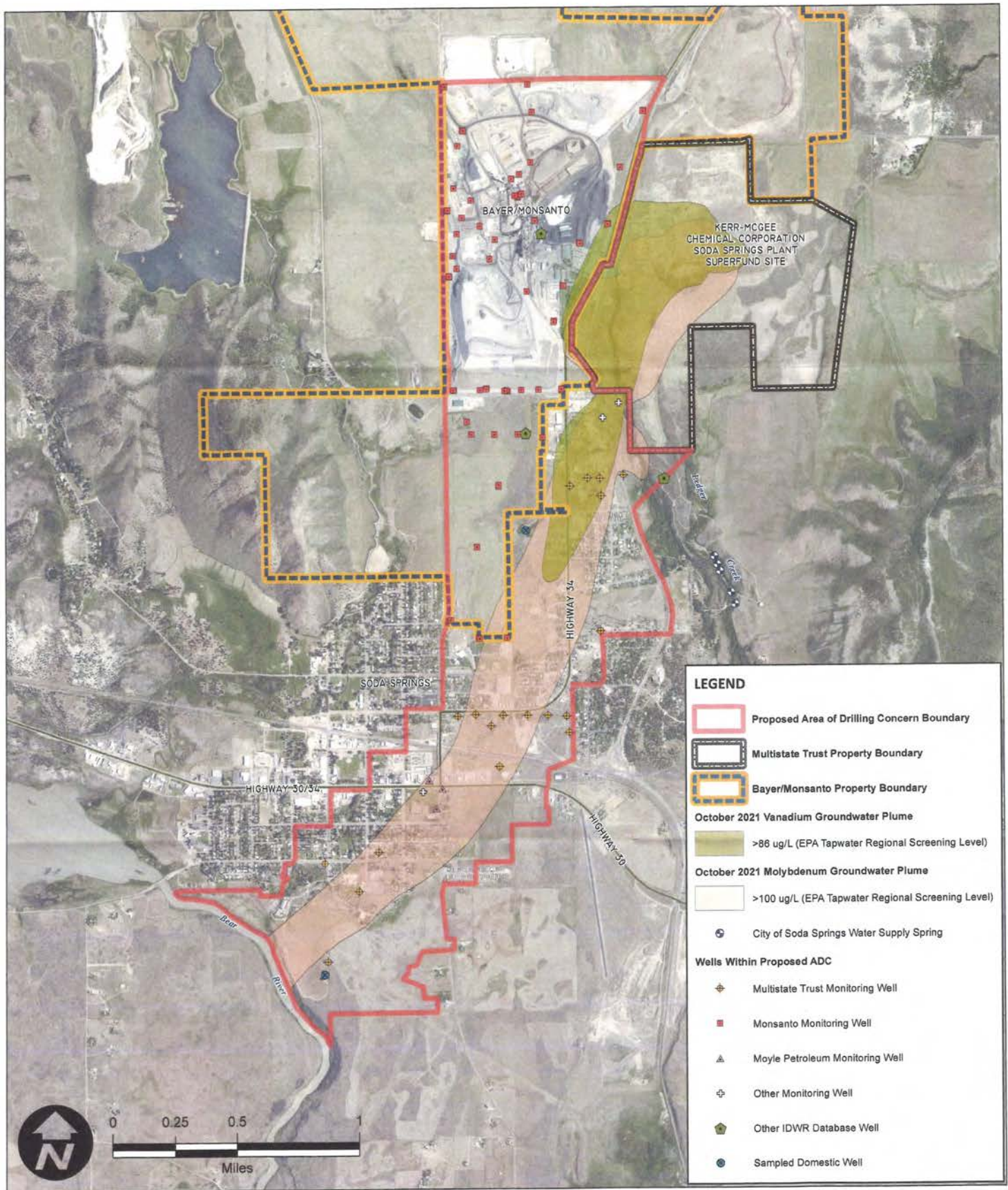
**FIGURE 5**  
SHALLOW GROUNDWATER POTENTIOMETRIC  
SURFACE - SEPTEMBER, 2015  
GROUNDWATER / SURFACE WATER REPORT, 2015 DATA



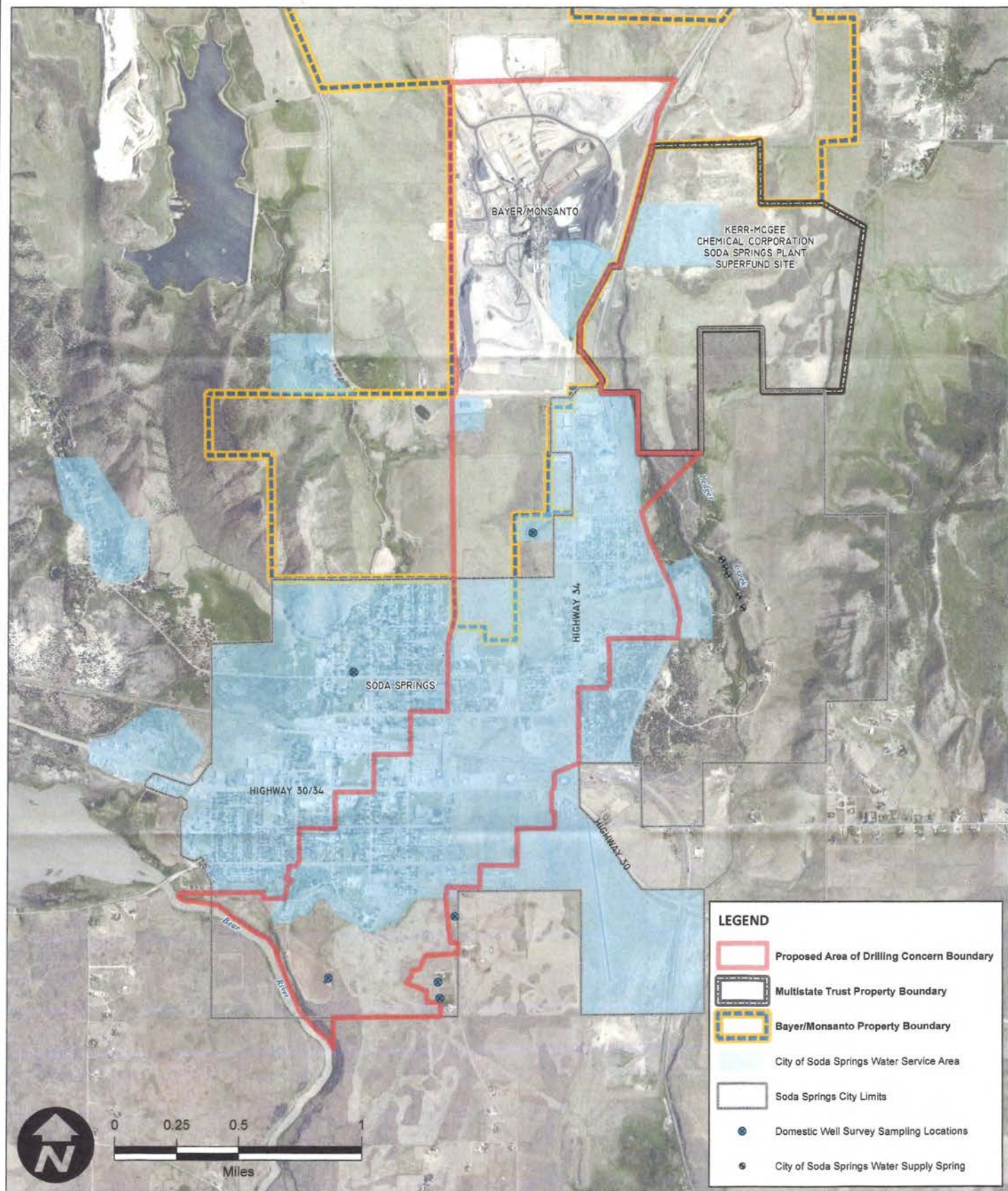












PREPARED FOR:



Greenfield Environmental Multistate Trust, LLC  
Trustee of the Multistate Environmental  
Response Trust

PETITION TO DESIGNATE AN  
AREA OF DRILLING CONCERN  
KMCC SODA SPRINGS PLANT SUPERFUND SITE  
SODA SPRINGS, IDAHO

CITY OF SODA SPRINGS  
WATER SERVICE AREA AND  
PROPOSED AREA OF DRILLING CONCERN  
BOUNDARY

FIGURE

5-3



- owner or their representative and the well driller shall sign the application. The practices of issuing an expedited "verbal" drilling permit approval and the "start card" procedure do not authorize drilling in the ADC, as provided in Rule 50.01g of the Idaho Well Driller Licensing Rules (Idaho Administrative Code 37.03.10).
- An application to drill a new well for domestic use in the ADC shall include a drilling prospectus prepared by an engineer or geologist licensed in Idaho. The prospectus shall include a diagram of the finished well showing all pertinent dimensions, and a narrative describing the construction materials and methods, including well seal methods, to be used in the drilling operation.
  - Drilling methods must be appropriately designed and implemented to prevent commingling of water from the shallow basalt aquifer with the water in underlying formations during drilling.
  - New wells drilled within the ADC must be designed and constructed to draw water from a formation below the shallow basalt aquifer (the Blackfoot Basalt), either from or below the underlying Salt Lake Formation, including the following restrictions:
    - The top of the well screen must be located a minimum of ten (10) feet below the contact of the Blackfoot Basalt with the underlying Salt Lake Formation and be sealed off from the overlying Blackfoot Basalt.
    - The completed well must include a full-length annular grout seal from the production (screened) zone to the ground surface, installed from the bottom up, to prevent potential vertical migration of contaminants from the Blackfoot Basalt to underlying formations.
  - An application to decommission (abandon) an existing well in the ADC shall include a prospectus providing for abandonment using a tremie pipe or pressure grouting procedure to place grout from the bottom of the well to the top. Installation or abandonment of monitoring, extraction or injection wells installed as part of environmental investigations or response actions within the ADC conducted pursuant to section 121(e)(1) of CERCLA, 42 U.S. Code § 9621(e)(1) are exempt from these additional restrictions but must meet all other IDWR requirements.

### **Ground Water Protection Program Recommendations**

Hydrometrics' report and request for designation of an ADC has been reviewed and evaluated by Department Staff. The report documents molybdenum and vanadium concentration in groundwater above USEPA tap water RSL and establishes contaminant plumes have migrated off-site approximately 3 miles and 1.5 miles respectively. Hydrogeologic conditions and the aerial extent of molybdenum and vanadium in groundwater are well characterized as a result of more than 30 years monitoring an extensive network of ground and surface water sampling locations.

Department staff concludes the Hydrometrics Inc. petition has sufficient technical data supporting consideration of the proposed ADC. Department staff recommends a public hearing be held in accordance with Idaho Code 42-238 to determine the public interest in the proposed ADC designation.

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