

## **TECHNICAL MEMORANDUM**

**Subject: Groundwater Characterization Plan, Cotter Corporation Canon City Milling Facility**

**To: John Hamrick, Jim Cain, Cotter Corporation**

**From: Errol Lawrence, HydroSolutions**

**Date: January 5, 2012**

### **Introduction**

This technical memorandum provides the a preliminary groundwater characterization plan (GWC Plan) for the Cotter Corporation Canon City Milling Facility (Facility) as required by the Colorado Department of Public Health and the Environment (CDPHE). Cotter has indicated to CDPHE that it will not renew its Radioactive Source Materials License and is in the process of decommissioning the mill for site closure.

Extensive groundwater monitoring has been and is currently being conducted at the Facility and in adjacent offsite areas. Groundwater remediation systems and associated groundwater monitoring, have been in place for several decades to address groundwater impacts from the Facility. Additional investigations are currently being conducted to support design of remedial systems for the Old Ponds Area, and Dam to Ditch Area, and to address the source and extent of trichloroethene (TCE) recently identified in the vicinity of the 1979 mill area.

### **Historic and Current Monitoring**

Groundwater monitoring of the Cotter Facility and surrounding areas began in the 1960s. Cotter set up a formal groundwater monitoring program in the 1980's. The Consent Decree (1988) and the Remedial Action Plan (RAP) established a groundwater monitoring program to include previous and new monitoring locations.

In 1994 Cotter, with concurrence from CDPHE and EPA, established a background monitoring location (024) and four onsite compliance locations (003, 371, 372 and 808).

Currently, groundwater sampling and analysis is routinely conducted at approximately 100 monitor wells. Analytes include uranium and molybdenum and field parameters for all wells. Most wells are analyzed for major ions, many for selenium, manganese and iron. Eight monitor wells are analyzed for radionuclides (total and dissolved) pursuant to Nuclear Regulatory Commission Regulatory Guide 4.4.

Additional investigations are ongoing in the area between the SCS Dam and the Deweese Dye Ditch Area, north of the Cotter Facility (referred to as the Dam to Ditch Area or DDA) and the Old Ponds Area (OPA). Investigations are ongoing into the source and distribution of trichloroethene (TCE) in soils and groundwater beneath the Former Mill Area. Results of these investigations will provide additional groundwater characterization data for the Facility.

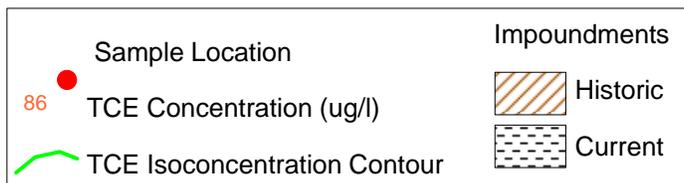
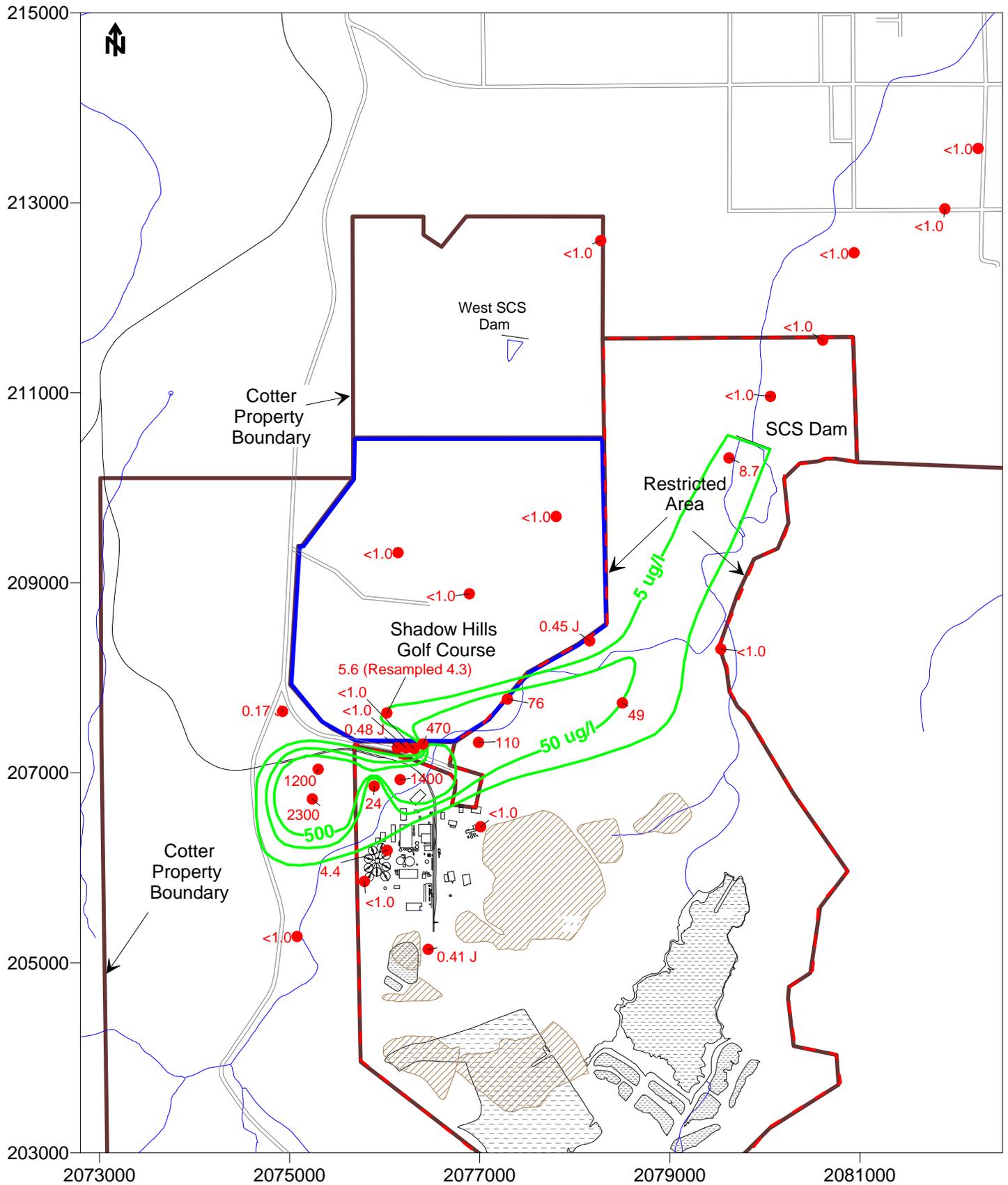
Cotter is currently conducting a records search to identify additional historic sampling that has occurred at the facility that would provide additional groundwater characterization data for the Facility.

### **Proposed Additional Groundwater Characterization**

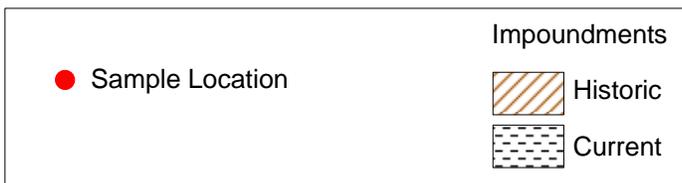
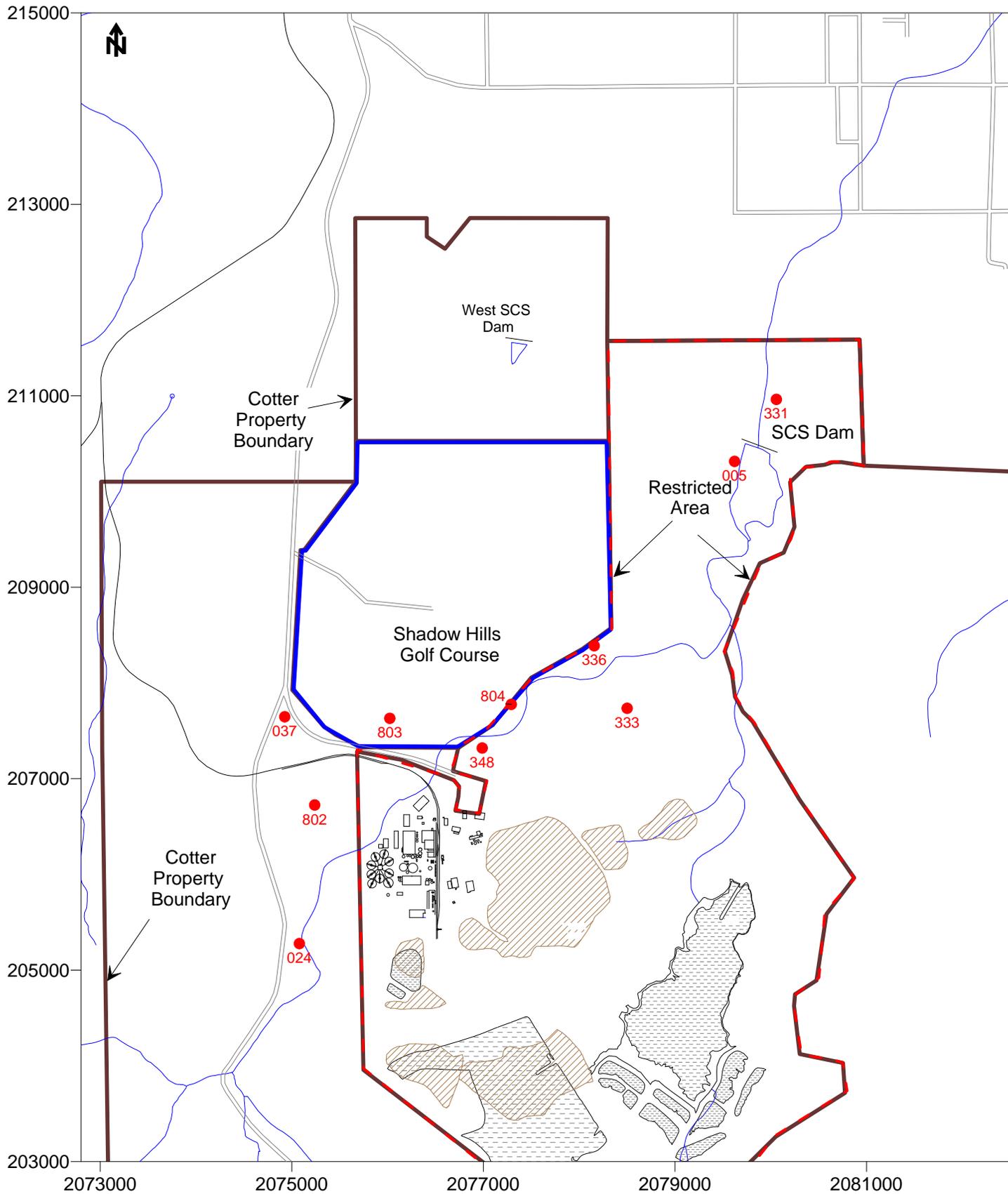
As previously described, an investigation is ongoing in the Former Mill Area to identify the source and extent of TCE impacts to soil and groundwater. Previous groundwater sampling and analysis for TCE conducted in 2011, (that included 28 monitor wells) delineated the flowpath and downgradient extent of TCE in groundwater. Additional soil gas investigations have not clearly identified the source of TCE but suggest that the former Catalyst Plant and Grind/Leach Building are potential source areas. A soil sampling plan has been submitted to CDPHE for further characterization. Results of the soil sampling will be used to identify locations that may be sources of TCE. Test pits will be placed at those locations to further characterize the vertical distribution of TCE at suspected source areas. The test pits will be excavated in a similar manner to those currently being excavated in the OPA. Based on the results of the soil sampling and test pit investigations, additional wells will be constructed in the vicinity of the Former Mill Area. Newly installed wells may also be used for remedial purposes, if such an action becomes necessary. One well will be placed west of monitor well 802 to provide verification that the TCE Plume does not extend west of currently known limits. Groundwater samples from any newly installed wells in the Former Mill Area will be analyzed for the constituents listed under CDPHE CCR 1007-1 Rules and Regulations Pertaining to Radiation Control Part 18, Criterion 10.

In order to fully characterize groundwater conditions throughout the Facility, it is proposed that a select group of wells be sampled and analyzed for volatile and semi-volatile organic constituents. The wells to be sampled will be along the primary groundwater flowpath, as evidenced by the distribution of TCE (Figure 1), that extends from the Former Mill Area down to the SCS Dam (Location 005) and along the northwestern edge of the Cotter Restricted Area. Wells to be included in the characterization sampling include (tentatively) the following: 331, 005, 346, 021, 333, 348, 804, 803, 802, 024. The proposed wells are shown on Figure 2.

Investigation is also ongoing in the OPA in support of a remedial design for that area. Monitor wells will be installed to evaluate the effectiveness of the remedial system that is implemented. One of the newly installed monitor wells will also be sampled and analyzed for organic and semi-volatile organic constituents to fully characterize groundwater in the OPA.



**Figure 1.**  
**TCE Concentration, May-Sept 2011**




**COTTER CORPORATION  
CANON CITY MILLING FACILITY**  
**Figure 2.**  
**Proposed Monitor Wells for  
Groundwater Characterization**  
 By: EPL Checked: JC File ID:fig2GWMonPlan.srf Date:1/4/12