FREEPORT-McMoRan
COPPER & GOLD

Copper Queen Branch/Freeport-McMoRan Corporation
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Bisbee, Arizona 85603

VIA UPS NEXT DAY AIR 1Z 871 126 01 9190 4747

June 10, 2010

Cynthia S. Campbell, Manager
Water Quality Compliance Section
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, AZ 85007

Re: Work Plan for Focused Bedrock Investigation
Mitigation Order on Consent Docket No. P-121-07

Dear Ms. Campbell:

Freeport-McMoRan Corporation, Copper Queen Branch (CQB) is submitting this work plan for a focused bedrock investigation pursuant to Mitigation Order on Consent Docket No. P-121-07. On April 29, 2009, CQB submitted an Aquifer Characterization Report (ACR) to the Arizona Department of Environmental Quality (ADEQ) in compliance with Section III.C of the mitigation order. ADEQ commented on the ACR in a letter to CQB dated March 11, 2010. CQB responded to ADEQ's comments on May 18, 2010. CQB prepared this work plan for a focused bedrock investigation east of the Black Gap Fault to supplement the ACR and address ADEQ's comment regarding the adequacy of the bedrock characterization.

The bedrock aquifer east of the Black Gap Fault exhibits a high degree of heterogeneity, a characteristic typical of bedrock aquifers in which groundwater flow occurs predominantly along poorly connected structures, such as fractures and bedding planes, rather than an extensive network of interconnected fractures approximating a porous medium. The additional characterization of the bedrock aquifer east of the Black Gap Fault and additional evaluation of geologic and hydrogeologic information as proposed in this work plan will allow CQB to determine if the conceptual and numerical models can be improved.

PROPOSED SCOPE OF WORK

The proposed scope of work for this focused investigation in the bedrock east of the Black Gap Fault consists of the following tasks:

- Task 1: Installation, aquifer testing, and water quality sampling of two new groundwater monitoring wells in the portion of the bedrock aquifer north of Bisbee Junction.
- Task 2: Aquifer testing at existing monitor wells TM-16 and TM-42 and at the Fleming well.

- Task 3: Re-evaluation of previously collected resistivity and induced polarization geophysical data covering this portion of the bedrock aquifer.
- Task 4: Detailed evaluation of water quality data in the bedrock east of the Black Gap fault.
- Task 5: ACR update and re-evaluation of conceptual and numerical models.

METHODOLOGY

Task 1: Installation and Testing of Two Monitoring Wells

Two new monitoring wells, designated as BMO-2010-1M and BMO-2010-2M, will be installed north and west of Bisbee Junction, at locations shown on Figure 1. The objectives of the wells are to obtain additional water quality, water level, and hydraulic testing data in the bedrock in this area. Drilling and sampling will be conducted according to the same methodology used for the "BMO" wells drilled in 2008 for the ACR. This methodology is described in detail in Section 3.3.3 of the work plan[1]. Drilling, well installation and development methods will be conducted as described in the Quality Assurance Project Plan (QAPP) in Appendix F of the work plan. The work plan allows for a variety of drilling methods, depending on conditions encountered. The preferred methods for drilling these two monitor wells is casing advance air hammer (ARCH or STRATEX®) in basin fill to the bedrock surface and reverse circulation air rotary into bedrock to the total depth. Aquifer testing at BMO-2010-1M and BMO-2010-2M will be conducted using the methods described in Section 3.5 of the ACR.

Well BMO-2010-1M will be drilled to identify the depth of the sulfate plume. This monitor well will be screened below the plume, which will be identified based on reconnaissance samples collected during drilling and from temporary wells at various depths during the advancement of the borehole. Reconnaissance sampling will be conducted according to Section 3.3.3.1 of the Work Plan. BMO-2010-1M will be adjacent to and deeper than monitoring well TM-16, which contains sulfate concentrations greater than 250 milligrams per liter and is screened in the Morita Formation to a depth of 115 feet below land surface. The preliminary design of BMO-2010-1M is shown on Figure 2.

Well BMO-2010-2M will be installed to provide water level data and hydraulic properties at a location between two different potentiometric regimes and where no other monitoring points are present. BMO-2010-2M is expected to be within the plume. The preliminary design for this well is shown on Figure 2.

Task 2: Aquifer Testing at Existing Monitor Wells

Aquifer tests will be conducted at existing monitor wells TM-16 and TM-42 and at the inactive Fleming water supply well, if access can be obtained. The results of aquifer testing will provide additional hydraulic properties estimates for bedrock and qualitative information on the degree of fracture control of groundwater flow.

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[1] Hydro Geo Chem, Inc., 2008, Revision 1, Work Plan to Characterize and Mitigate Sulfate with respect to Drinking Water Supplies in the Vicinity of the Concentrator Tailing Storage Area, Cochise County, Arizona, Mitigation Order on Consent Docket No. P-121-07, July 3, 2008.

Step rate pumping tests of 10 to 12 hours will be conducted at each of the three wells, TM-16, TM-42 and Fleming. A pump rig will be retained to remove the existing pumps from TM-16 and TM-42 (Fleming well is not equipped with a pump) and temporarily install higher capacity pumps (up to 50 gpm) for the tests. Testing will be conducted according to Section 4.3.8 of the QAPP and Section 3.5 of the ACR. The pumping test at TM-16 will be coordinated with testing at BMO-2010-1M, which will be used as an observation well. Pressure transducers and data loggers will be operated according to Section 4.5.4 of the QAPP.

Task 3: Re-evaluation of Previously Collected Geophysical Data

Resistivity and induced polarization geophysical data covering a portion of the bedrock aquifer east of the Black Gap Fault were collected in 1988 and 1989. Specifically, three north-south lines were run across the Black Gap Fault west of Bisbee Junction and two east-west lines were run between the tailing impoundment and Bisbee Junction. The geophysical data will be compiled and interpreted to identify bedrock structures that may control groundwater flow. If additional information on bedrock features can be determined, the data may used to revise the conceptual and/or numerical models.

Task 4: Evaluation of Water Quality Data

A detailed evaluation of water quality data in the bedrock east of the Black Gap Fault will be conducted. The major element chemistry of wells east of the Black Gap fault will be evaluated to discern if there are different water types that can be used to infer groundwater flow directions or aquifer units. Piper or Stiff diagrams will be plotted using Aquachem® or similar program to graphically depict water types. Water quality data for current and historical conditions will be evaluated to identify any trends over time.

Task 5: ACR Update and Re-Evaluation of Conceptual and Numerical Models

The results of Tasks 1 through 4 will be incorporated into the ACR. The conceptual and numerical models for bedrock east of the Black Gap Fault will be re-evaluated. If warranted, conceptual and numerical models in the ACR will be revised based on the new information. In addition, the ACR will be updated to address ADEQ comments as described in CQB's May 18, 2010 response to ADEQ comments.

SCHEDULE

CQB proposes the following schedule to complete the scope of work:

DATE	TASK
June 15-August 15, 2010	Task 4: Evaluation of Water quality Data East of the Black Gap Fault
	Task 3: Re-evaluation of Geophysical Data
July 8-October 1, 2010	Task 1: Installation and Testing of Bisbee Junction Wells
	Task 2: Testing of TM-42, TM-16, and Fleming wells
September 1-December 1, 2010	Task 5: Revision of Conceptual and Numerical Models, and ACR.

CQB will implement this work plan immediately unless we hear otherwise from ADEQ.

Sincerely,

Rebecca A. Sawyer
Senior Environmental Engineer
Freeport-McMoRan Corporation, Copper Queen Branch

cc: Michael Jaworski, Freeport-McMoRan Corporation, Copper Queen Branch
Stuart M. Brown, Freeport-McMoRan Copper & Gold
David Haag, Senior Hydrologist, Groundwater Section, ADEQ
James R. Norris, Clear Creek Associates

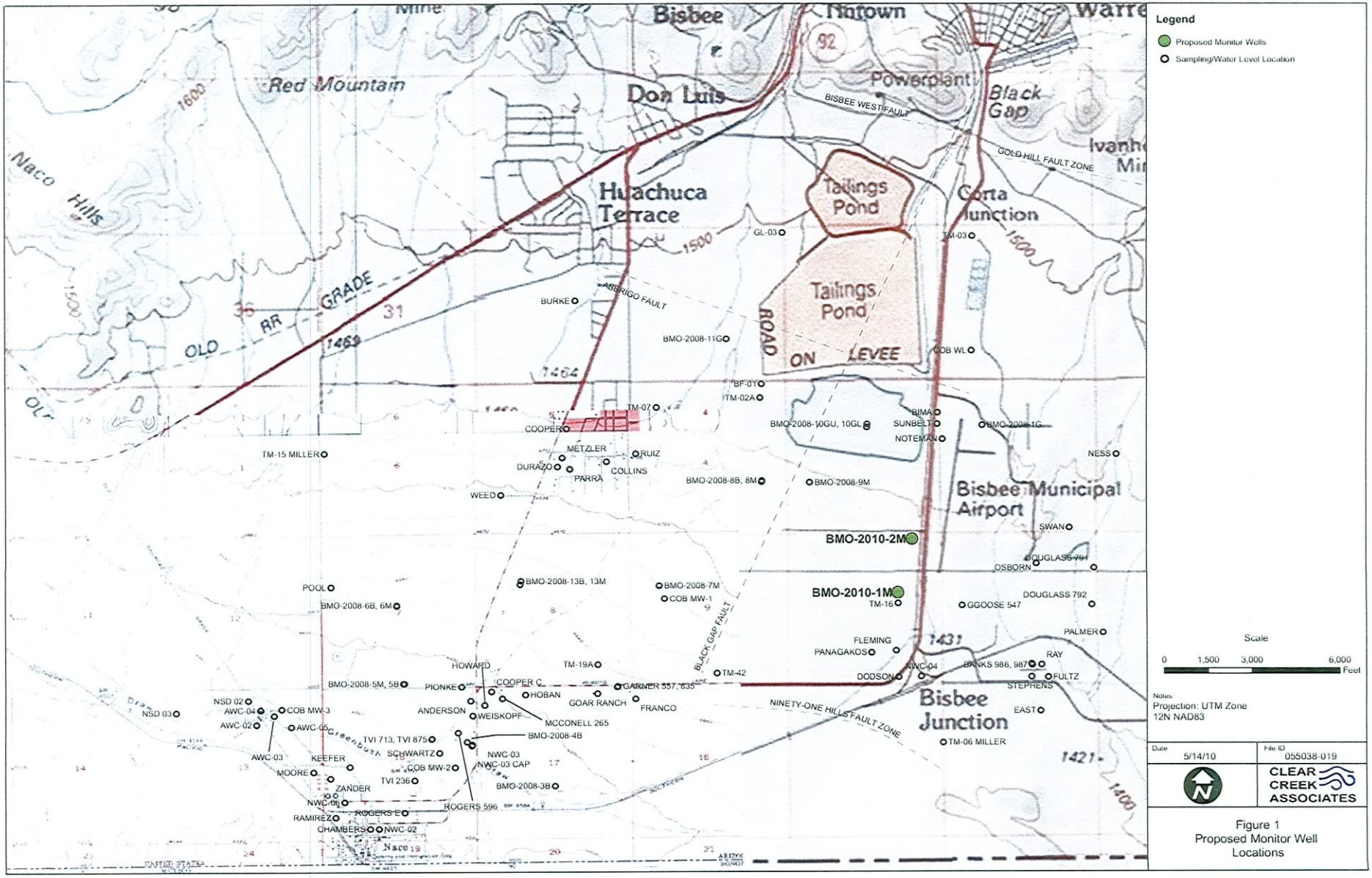
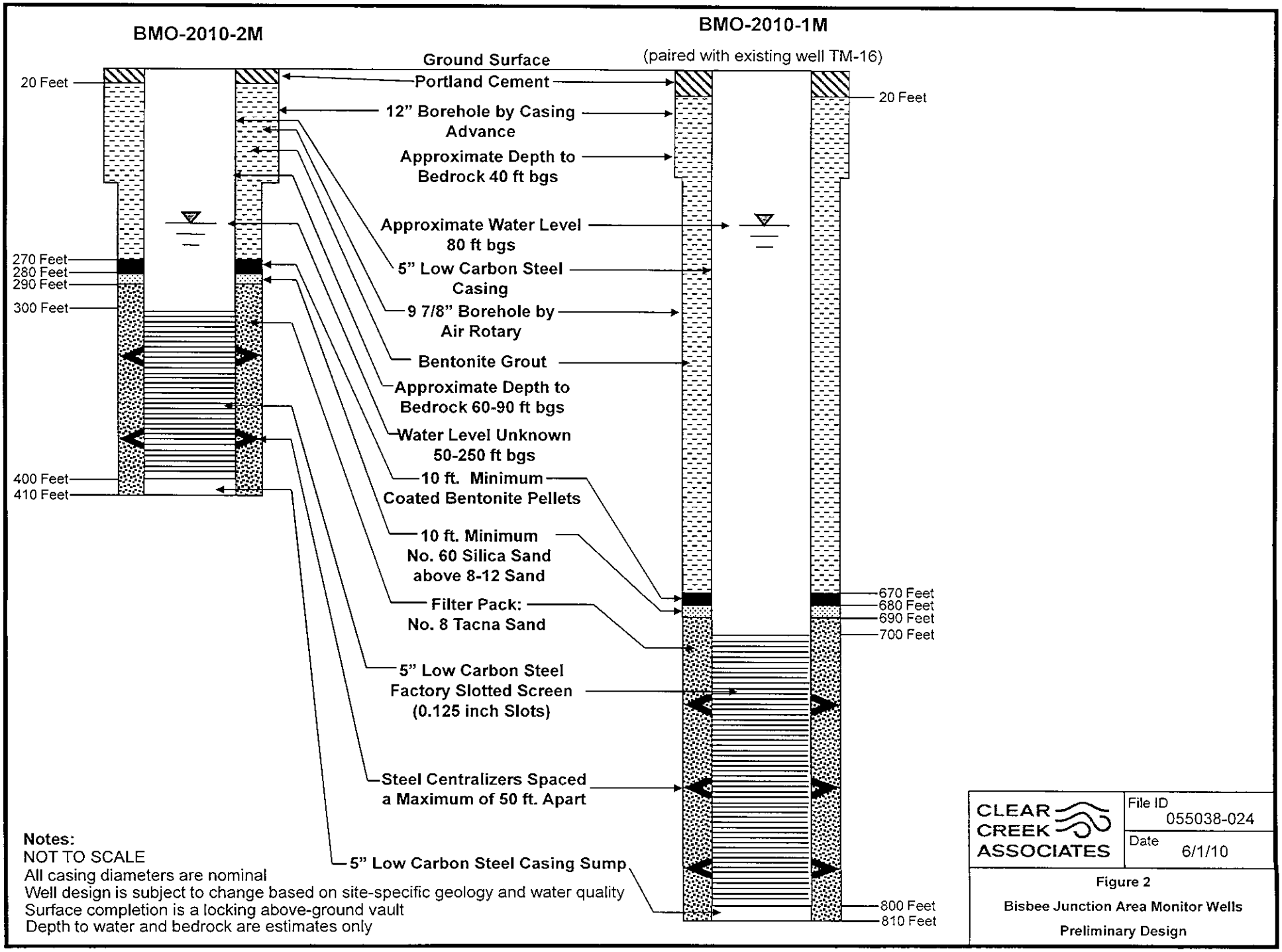


Figure 1
Proposed Monitor Well Locations



Notes:
NOT TO SCALE
All casing diameters are nominal
Well design is subject to change based on site-specific geology and water quality
Surface completion is a locking above-ground vault
Depth to water and bedrock are estimates only

CLEAR CREEK ASSOCIATES

File ID 055038-024

Date 6/1/10

Figure 2

Bisbee Junction Area Monitor Wells

Preliminary Design