



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

March 13, 2014

Michael McPhie
President and Chief Executive Officer
Florence Copper, Inc.
1575 W. Hunt Highway
Florence, AZ 85132

**RE: Request for Information
Class III Underground Injection Control Well Permit Application
Florence Copper, Inc.**

Dear Mr. McPhie:

The United States Environmental Protection Agency, Region IX (EPA) is conducting a technical review of the March 25, 2011 Underground Injection Control (UIC) Permit application from Florence Copper, Inc. ("FC", previously known as Curis Resources (Arizona), Inc.), as modified by Dan Johnson's letter dated June 1, 2012 and supplemental submittals for the proposed Production Test Facility (PTF). We have reviewed the updated Class III UIC Permit application dated December 2013 (the UIC Permit application) for the proposed PTF. In order to continue our evaluation of your application materials, we are requesting additional information and clarifications as detailed in the enclosure.

Please address all items noted in the enclosure by submitting two copies of a complete revised application in hard copy and in electronic format.

Please submit the information requested in this letter to:

Attn: Nancy Rumrill
U.S. EPA Region IX, (WTR-9)
75 Hawthorne Street
San Francisco, CA 94105

If you have any questions regarding this letter, please contact me at 415-972-3417 or call Nancy Rumrill at 415-972-3293.

Sincerely,



David Albright
Manager, Ground Water Office

Enclosure

cc w/enc: Richard Mendolia, ADEQ (via e-mail)

Dan Johnson, VP, General Manager, Florence Copper, Inc. (via e-mail)

ENCLOSURE

March 13, 2014

Request for Information

Regarding the Florence Copper Class III UIC Permit Application

Attachment A, Area of Review

1. FC's response to Comment 2 in the September 10, 2012 response to EPA comments includes a reference to Attachment 14A of the Temporary Aquifer Protection Permit (APP) application dated March 1, 2012. Attachment 14A discusses the Hydrologic Study and the groundwater flow model in much greater detail than provided in the updated UIC Permit application and previous responses to comments. Please include the relevant discussion, figures, tables, and exhibits from Attachment 14A in Attachment A, or provide that information as an appendix to Attachment A in the UIC Permit application. In addition, please add Attachments 14B and 14C related to the Hydrologic Study to the UIC Permit application either in the body of Attachment A or as Appendices to the application to provide relevant background information related to the groundwater flow model. Please also provide a discussion of the basis for the groundwater flow model in Attachment A of the UIC Permit application referencing the Attachments 14A, 14B, and 14C and where the Attachments are located in the application.

Please include the most recent electronic files on CDs for the groundwater flow model in the application.

Attachment B, Map of Area and Area of Review

2. Maps submitted in Attachment B of the March 2011 UIC Permit application were replaced by three maps included in Appendix 6, *Revised Maps* of the July 2, 2013 FC response to the RFI dated June 12, 2013. Please include those three maps in Attachment B of the UIC Permit application.

Attachment C, Corrective Action Plan

3. Please include Figure Temp APP RTC (E) 18-1, from Attachment 3 of the May 23, 2012 response to the Arizona Department of Environmental Quality (ADEQ)'s May 2, 2012 request for information (RFI) in this Attachment C or in Attachment B. It is a map that provides a focused view of all wells and coreholes to be abandoned within the PTF well field and within 500 feet of any well in the well field. Please also include the original corehole and well construction records provided in the September 2012 response to an EPA request for information in Attachment C or referenced as an appendix in the UIC Permit application.

Attachment D, Maps and Cross Sections of USDWs

4. Figures D-1 through D-8, included in the March 2011 UIC application, are missing in the updated UIC Permit application. Please update those figures and include them in the UIC Permit application. Comparable figures in Attachments 14A (Figures 14A-8 and 14A-9) and 14C (Figures 14C- 48 to 14C-52) were updated in the March 2012 Temporary APP Application. Please modify the limits of the USDWs depicted in Figures D-2 and D-3 to be consistent with the existing lateral aquifer exemption boundary.

Attachment F, Maps and Cross Sections of Geologic Lithology

5. The maps and cross sections submitted with the March 2011 UIC application, Figures F-2 through F-9, and modified in the March 2012 Temporary APP application are missing in the updated UIC Permit application. See Attachments 14A (Figures 14A-8 and 14A-9) and 14C (Figures 14C- 48 to 14C-52) in the APP application. Please include those modified figures in the UIC Permit application.

Attachment H, Operating Data

6. The July 2, 2013 FC response letter states that Attachment H was not modified by the June 1, 2012 letter from FC, or by subsequent submittals. However, the June 1, 2012 letter states that the geochemical modeling report was revised to reflect no stacking and reduced operating and restoration times for the PTF, which is inconsistent with the July 2, 2013 response and the discussion at Section H.6.4 in the December 2013 UIC application. Please clarify.

In addition, the February 22, 2012 version of the Geochemical Evaluation of Forecast Process Solutions at Florence Copper Project Report in Exhibit H-1 of the updated UIC application excludes a representative composition of the pre-stacked solution in Table 3.1. The discussion in Section H.6.4 of the updated UIC Permit application refers to the forecast composition of pre-stacked Pregnant Leach Solution (PLS) Solution No. 3 of Table 3.1 of Exhibit H-1, but that column is missing from Table 3.1. Please clarify that statement and modify Attachment H, appropriately.

Attachment I, Formation Testing Program

7. Please add that the PTF operator will perform aquifer pump tests prior to injection in order to evaluate subsurface characteristics of the Oxide Bedrock Unit, overlying basin fill units, and the confining Middle Fine Grained Unit within the PTF Area of Review (AOR), as stated in the revised FTP Operations Plan in Exhibit K-2 in Attachment K of the updated UIC Permit application.
8. The 1996 BHP Site Characterization Report and Fracture Gradient Packer Testing Data are provided as Exhibits I-1 and I-2, respectively on CDs within Attachment I in the

updated application. Please provide paper copies, in addition to the CDs, as an appendix to the application and reference the appendix in the text of this Attachment.

Attachment K, Injection Procedures

9. The five bulleted items listed in Section K.3.4.2 on page 5 are incomplete and inconsistent with the eight items listed on page 3 of the Operations Plan under *Injection Monitoring and Controls*. Pressure transducers are included at the injection wellhead, annulus, and injection zone in the Operations Plan but are omitted from the discussion on page 5 of Attachment K. Please clarify and/or correct those omissions on page 5.
10. Please modify the second sentence in the last paragraph on page 2 of the Operations Plan to read as follows: Test results will be reported to the Arizona Department of Environmental Quality (ADEQ) in accordance with Aquifer Protection Permit (APP) requirements “and to USEPA in accordance with UIC Permit conditions”.
11. Please add to the Operations Plan, Table 1, a transducer to the Injection System, Injection Well Head line to measure annular pressure above the packer with columns to describe conditions, possible cause, response, and follow-up action.
12. Exhibit A presents Table 3.1, Estimated Composition of PTF ISCR Process Solutions, but omits a representative composition of the pre-stacked solution as discussed above in the comments about Attachment H. Please clarify the discussion in Section H.6.4 of the updated UIC Permit application and modify Table 3.1 if pre- stacking will occur in PTF operations as discussed in Attachment H.

Attachment L, Well Construction Procedures

13. The first sentence in the third paragraph in the Introduction states that Attachment L describes procedures that will be used to construct the proposed Class III injection and recovery wells. Please clarify that statement because the discussion in Section L.2.5 on page 4 includes a description of cementing characteristics for observation and multi-level sampling wells and for “all wells.” In addition, discussion of the well construction procedures for the seven supplemental monitoring wells is missing from the updated UIC Permit application. Please add this discussion to Attachment L, including the plan to conduct open-hole and cased hole geophysical logs and identify the proposed screened intervals in each well.

Attachment M, Well Construction Details

14. Discussion and schematics of the construction details of the seven supplemental monitoring wells are omitted from the updated UIC Permit application. Please add this discussion and the schematics to Attachment M. Please include Figures 18-2 and 18-3 in the September 10, 2012 response to the July 20, 2012 RFI and the well design figures

presented in Attachments 4 (Fig. 11-2) and 5 (Figs. 12-1 through 12-4) of the December 14, 2012 FC response to the November 8, 2012 RFI. Also, please add Figure 11-1, Monitor Wells Locations, from the Attachment 4 to Attachment P of the UIC Permit application.

15. Appendix D of the September 10, 2012 response to the July 20, 2012 RFI titled "Temporary APP Attachment 9 – Design Documents" was provided on a CD., but is missing in the updated UIC Permit application. Please include the paper copy of Exhibit 9A in Attachment 9 of the Temporary APP application (for the Design Documents Pertaining to PTF Well Field) and include the CD as an appendix to the UIC Permit application.

Attachment N, Changes in Injected Fluid

16. At N.3, Changes in Pressure of Injected Fluid, N.3.1, Groundwater Flow Model, a discussion similar to that provided in the last three paragraphs on page 4 of the March 2011 UIC application is omitted from the updated UIC Permit application. Please add a discussion of the predicted hydrostatic pressure effects and head differentials indicated from the latest model results. Also, please add to this section the relevant discussion in the responses to EPA comments in the September 2012 and December 2012 FC submittals, especially the discussion of possible preferential flow and the effects of the fault zones on hydraulic control discussed in response to Comment 7 in the December 2012 response.
17. At N.4, Native Fluid Displacement, Figures N-1 and N-2 display the PTF well field as it was displayed in the September 2012 FC response to EPA comments rather than the modified version in Figures 9-1 and 9-2 in the December 2012 FC response to EPA comments. For clarity and consistency with the reasons for the modification, please display the figures of the PTF well field as in the December 2012 submittal. In addition, the well field is described as 200 by 200 feet in size, but the scale of the map of the well field indicates the size as approximately 300 by 300 feet. If the map scale is correct, please correct the descriptions of the well field size where it is described as 200 by 200 feet in the text of the UIC Permit application.
18. Please include a hard copy in the appendix to the UIC Permit application of the electronic groundwater flow model data and output files that produced the results discussed in Attachments A and N (also see the comments on Attachment A above).

Attachment O, Plans for Well Failures (Contingency Plan)

19. Please include the Contingency plans and mechanical integrity requirements for the seven supplemental monitoring wells in the discussion in Attachment O. All are located within the AOR and are subject to UIC well construction and plugging and abandonment requirements. Annular conductivity devices (ACD) are not included in the monitoring

well design schematics, and pressure testing of the casing and logging programs for the monitoring wells are omitted from the mechanical integrity demonstration discussion. The observation wells and multi-level sampling wells located within the PTF well field are included in the discussion of those requirements. The discussion in the Introduction on page 2 excludes the multi-level sampling wells from mechanical integrity requirements, but states that ACDs will be placed in those wells in Section O.3.1 on page 4, which is applicable to a mechanical integrity demonstration. The discussion on page 6 refers to running cement bond logs and ACD monitoring in wells with polyvinyl chloride (PVC) or fiber-reinforced plastic (FRP) casing, which includes observation and multi-level sampling wells. Please clarify and correct the inconsistency in those statements. A similar discussion of requirements would apply to the seven supplemental monitoring wells.

Attachment P, Monitoring Program

20. At P.5.1 Groundwater Quality Monitoring, the monitoring for Alert Levels (ALs) and Aquifer Quality Limits (AQLs) for certain parameters listed in Tables P-3 and P-4 have been changed from those listed in the 2011 UIC Permit application. For example, the AL for fluoride in Table P-3 and Table P-4 was increased from 1.2 or 1.3 to 3.2 mg/L in the existing point of compliance (POC) wells. Please discuss the basis for those changes.
21. Please add Attachment 2, labeled *Revised Figure 11-1, Monitor Well Location (Revised), Proposed Test Facility*, listed under Item 10 of the March 11, 2013 response to the RFI dated February 27, 2013, to Attachment P of the UIC Permit application.
22. Please add Attachment 3, labeled *Revised Figure 11-2. Supplemental Monitoring Well M61-1-LBF Design* listed under Item 10 of the March 11, 2013 response to the RFI dated February 27, 2013, to Attachment P of the UIC Permit application.
23. Please add Attachment 5 of the December 14, 2012 response to RFI dated November 8, 2012, listed under Item 9 of the March 11, 2013 response to the RFI dated February 27, 2013, to Attachment P of the UIC Permit application. Attachment 5 includes Figures 12-1 through 12-4, which are labeled as *Supplemental Monitoring Well Design* for wells M57-O through M60-O.

Attachment Q, Plugging and Abandonment Plan

24. Please include the Plugging and Abandonment Plans (EPA Forms 7520-14) and schematic diagrams of coreholes and wells located within the AOR provided in Appendix G of the September 10, 2012 FC response to EPA comments in the July 20, 2012 RFI.
25. Please include a Closure and Post-Closure Plan in the UIC Permit application. There is little discussion of aquifer restoration plans and post-closure monitoring activities within the UIC Permit application. Please submit a Closure and Post-Closure Plan similar to the

Plan provided in Appendix F of the 1997 UIC Permit, but adapted to apply to closure of the PTF operation. Please include the discussion in Attachment 16 of the Temporary APP Application that relates to UIC closure and post-closure operations in the Closure and Post-Closure Plan.

Attachment R, Necessary Resources

26. Appendix H, Revised Temporary APP Table 5.2, PTF Closure and Post-Closure Cost Estimates, provided in the September 10, 2012 FC response to the July 20, 2012 RFI, is omitted from the updated UIC Permit application. The total cost estimate of \$5,359,951, including surface closure and post-closure costs, is presented on page 5 of Table 5.2. Exhibit R-1 in the updated UIC Permit application presents only the cost estimate for the closure of the PTF process solution impoundment and pipeline channel provided by Knight Piesold Consulting, dated March 2, 2012, which amounts to a total of \$422,140. The total estimated cost of closure and post-closure operations attributable to the 24 PTF wells, 33 POC wells, 21 BHP test wells, and three monitoring wells is \$4,064,129, based on the figures in Table 5.2 of the September 10, 2012 FC response. That number does not include the closure costs for five supplemental monitoring wells added after that date, which would amount to an estimated additional \$56,250. The base dollar amount to meet UIC financial assurance requirements is approximately \$4,120,379 on that basis. EPA would also consider additional contingency costs to that amount.

The surety bond (number 1080127) in Exhibit R-2, Demonstration of Financial Capability, issued for the ADEQ Temporary Aquifer Protection Permit, provides a total surety amount of \$3,487,076, which is far less than the total cost estimate of \$5,359,951 listed in the September 2012 response to the July 20, 2012 RFI. The surety amount is also less than the total cost estimate of \$3,948,458 presented in Table 5-2 in Attachment 5 of the March 2012 Temporary APP application, which is referenced in Attachment R of the updated UIC Permit application.

Please add Appendix H to Attachment R of the UIC Permit application and clarify and correct the large discrepancy between the most recent total cost estimate of \$5,359,951 and the surety amount. In addition, please update the amount to account for inflation.

27. Please also add the discussion in the Explanation of Cost Estimates in Attachment 5 in the March 2012 Temporary APP Application that relates to the cost estimates for UIC closure and post-closure operations to Attachment R in the UIC Permit application.

Attachment S, Aquifer Exemption

28. The original aquifer exemption boundaries, as approved in May 1997 for the proposed Florence Copper ISCR project, remain unchanged for the PTF operation. However, the 500-foot AOR that circumscribes the PTF well field defines the area in which contaminants must be contained over the seven-year life of the PTF. Please revise the discussion in Attachment S and modify Figures S-1 and S-2 to remove the 500-foot

circular boundary depicting the “proposed aquifer exemption area.” Please add the PTF well field to Figure S-2. Please modify the limits of USDWs depicted in Figures D-2 and D-3 in Attachment D of the UIC Permit application to be consistent with the existing lateral aquifer exemption boundary, as approved in May 1997.

29. Figure S-2 depicts the vertical extent of the existing aquifer exemption boundary. In addition, Figure S-2 shows the Oxide Zone in contact with the Middle Fine Grained Unit base within the exempted zone underlying the PTF AOR in the vertical view looking north, while that is not the case in Figures D-2 and D-3. Please modify Figure S-2 accordingly.
30. Please include a copy of the report on CD in an Appendix to the UIC Permit application entitled “NI 43-101 Florence Copper Project, Technical Report, Pre-Feasibility Study” as referenced in Section S.3.

Applicable to the July 2, 2013 FC Response to EPA Request for Information Letter dated June 12, 2013

31. Response to Comment 2: Please change Figure 3 to 2 in second paragraph, first sentence. There is no Figure 3.
32. Appendix 3, Revised Operations Plan, page 2: Please add “and to USEPA in accordance with UIC Permit conditions” after *in accordance with Aquifer Protection Permit (APP) requirements* ending at the top of page 2.
33. Appendix 3, Revised Operations Plan, Table 1: Please add a transducer to the Injection System, Injection Well Head line to measure annular pressure above the packer with columns to describe conditions, possible cause, response, and follow-up action.
34. Appendix 5, Alert Levels to Attachment P of the UIC Permit Application:
 - a) Section 1.3.1, page 3: first paragraph, first sentence: Please substitute “Arizona and USEPA- approved methods” for *Arizona-approved methods* and delete the second sentence.
 - b) Section 1.3.6, page 5: Please add “and Parts II.H.2 of the UIC Permit.” after *Section 2.6.2.4 of Temporary APP No. 106360* to the end of sentence 3.
 - c) Section 1.4: Please replace *three years* with “two years” in the last full sentence for EPA requirements for notice of operational status during periods of temporary cessation of operations.
 - d) Section 1.4: Please edit the last sentence to read “written notification of closure to USEPA and ADEQ in accordance with permit conditions.”
35. Please add the July 2 letter attachments and/or appendices and subsequent submittals to EPA to the List of Documents applicable to the UIC Permit Application and Related Submittals dated May 3, 2013.

