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

November 15, 2019

Ronnie P. Hawks
Jennings, Haug & Cunningham Lawyers
2800 North Central Avenue, Suite 1800
Phoenix, AZ 85004-1049

Re: Response to Letter dated September 5, 2019 regarding the Class III Underground Injection Control Area Permit No. R9UIC-AZ3-FY11-1 for the Florence Copper, Inc. Production Test Facility

Dear Mr. Hawks:

I am writing to respond to your September 5, 2019 letter expressing concerns with EPA's oversight of Florence Copper, Inc.'s (FCI's) Class III UIC Area Permit No. R9UIC-AZ3-FY11-1 for their Production Test Facility (PTF). Your letter raises questions about initial test results from the PTF, the integrity of several monitoring wells constructed for the project, the monitoring standards established by the terms of the Permit, and alleges EPA is failing to hold FCI accountable to the Permit's requirements. Contrary to your perspective, EPA is closely monitoring FCI's implementation of the Permit and ensuring FCI's compliance with the Permit's terms and conditions to protect Underground Sources of Drinking Water (USDWs).

In some instances, your comments highlight data variabilities associated with initial testing and monitoring that was either subsequently clarified/corrected or that reflect uncertainties anticipated for a pilot test. In other cases, your comments reflect misunderstandings about the intent of specific terms and conditions or the interpretation of collected data. As we noted in our Response to Comments (RTC) document issued with the Permit, the uncertainty of model predictions is reduced, and models can be calibrated by the application of the PTF well testing and logging data and by operation of the PTF. Admittedly, the requirements imposed by FCI's UIC Permit are complex and extensive, and the project is specifically intended to clarify uncertainties regarding formation characteristics/behavior and operational variabilities.

Regarding your comments about the behavior of the aquifer as an equivalent porous medium, please refer to EPA's response numbers 4, 57, and 58 to this issue in the PTF Permit Response to Comments document for the UIC Permit action dated December 20, 2016. As noted in the RTC, EPA considered the Equivalent Porous Media (EPM) model utilized to inform the permit application for the PTF appropriate for the purpose of constructing a groundwater model of the orebody, with variations for consideration of fault zones that may provide preferential flow paths. The testing and performance of the PTF was expected to reveal the heterogeneity and directional flow variability unique to the site. Flow of fluids into and out of the PTF well field is being managed pursuant to the Permit to maintain the required 1-foot head differential and hydraulic control. Moreover, monitoring performance of the PTF provides real-world data to enable the assessment of hydraulic containment capabilities for ISCR operations.

As noted in your letter, mechanical integrity (MI) testing of injection and recovery wells is a Permit requirement. Regarding recovery wells R-08 and R-09, external MI was not demonstrated from cement evaluation logs, however, these recovery wells passed the required temperature logging run in early February 2019, thus confirming that both wells have external mechanical integrity in compliance with Part II.E.3.a.ii.B. of the Permit. Temperature logging is the required method that demonstrates a lack of fluid movement in the annulus into the Lower Basin Fill Unit (LBFU) and/or the Upper Basin Fill Unit (UBFU). FCI complied with the mechanical integrity testing of these recovery wells.

Your letter highlights annular pressure testing results for monitoring wells M55-UBF, M56-LBF, M61-LBF, and MW-01-LBF. While these wells did fail the required annular pressure tests, it should be noted that the UIC regulations at 40 CFR §146.8(a) only require a demonstration of internal mechanical integrity for injection wells (not these monitoring wells). Moreover, these monitoring wells are not open to the injection zone and will not be exposed to injection zone pressures from the bedrock oxide unit within the wellbore. Thus, there is no increased risk of fluid movement into a USDW.

In addition, contrary to your assertion of concerns about cement bond results for these monitoring wells, all the wells demonstrated external mechanical integrity by temperature logging which confirmed the absence of significant fluid movement through the casing/wellbore annulus or vertical channels adjacent to the well bore, as required by Permit condition Part II.E.3.ii.B. The Permit allows EPA to require additional mechanical integrity testing at any time in the future and EPA could require remedial cementing if there was a loss of external mechanical integrity.

Another concern noted in your letter is the lack of electrical conductivity (EC) sensors on all Westbay wells (also called multi-level sampling wells). However, the UIC permit language did not require conductivity sensors to be installed in the annulus of the Westbay wells through the LBFU/Oxide interface. Only the observation wells were required to install conductivity sensors in the annulus through the LBFU/Oxide interface. However, each of these wells is equipped with an annular conductivity device (ACD) to detect vertical channels adjacent to the wellbore placed as close as possible and above the Middle Fine-Grained Unit (MFGU) in compliance with the Permit condition Part II.C.6.c. EPA also issued a minor permit modification to clarify the requirement for temperature logging for these wells, pursuant to the monitoring required at Part II.E.3.ii.A of the Permit, to demonstrate external mechanical integrity during the life of the wells. Note that this is a quarterly requirement and not a one-time test. See the minor permit modification at https://www.epa.gov/uic/florence-copper-inc-class-iii-situ-production-copper-permit-no-r9uic-az3-fy11-1.

Regarding your concerns about FCI's approach to monitoring and reporting, please see EPA's PTF Permit RTC document that addresses these monitoring related issues. Your comment regarding the location of MW-01 being too far to detect a release from the PTF reflects a misunderstanding of the purpose of this well in the UIC Permit. As specifically noted in the RTC EPA Response number 30, MW-01 and the other monitoring wells required by the UIC Permit would not be expected to detect an excursion in the planned two-year duration of ISCR and rinsing operations. Any potential detection of excursions by MW-01 would not be expected until late in the five (5) year post-closure monitoring period because of the estimated travel time to the monitoring wells. Moreover, a loss of

hydraulic control for an extended period and an excursion during ISCR operations would be detected at the observation wells long before it could reach a monitoring well.

Finally, your letter raised concerns about the EPA-approved alert levels and aquifer quality limits, including the noted sulfate and arsenic levels, submitted by Florence Copper based on accepted statistical methods and other methods approved by EPA. The ALs establish specific points in which contingency plans, pursuant to Part II.H.2, are activated to mitigate the discharge responsible for an exceedance. If an exceedance of alert levels due to ISCR solutions were to occur at the supplemental monitoring wells, it would likely be one of the Level One analytes representative of constituents of ISCR solutions which provide an early indication of groundwater impacts. Pursuant to the conditions of the Permit, there are different ALs associated with different wells, based on the background sampling that was conducted over time to account for natural variability of the groundwater. Most of the ALs are set at levels below or well below primary and secondary maximum contaminant levels (MCLs). However, any AL or AQL exceedance would have to be resolved. Further, the Permit requires FCI to determine ambient groundwater concentrations that establish preoperational background restoration standards. The Permit conditions at Part II.I for aquifer restoration require groundwater in the injection and recovery zone to be restored to concentrations which are pre-operational background concentrations or equal to primary MCLs, whichever is higher, to prevent migration outside the wellfield. Thus, aquifer restoration will achieve primary or secondary MCL levels in most instances, and only allow exceedance of these standards where background concentrations already exceeded the standards.

Please be assured that EPA is committed to ensuring that the PTF Permit activities are given careful oversight and our focus will continue to be compliance with the UIC regulations and protection of USDWs in accordance with the Permit's terms and conditions. If you have further questions, please contact Dustin Minor of our Office of Regional Counsel at 415-972-3888.

Sincerely,

David Albright
Manager, Groundwater Protection Section

cc (by e-mail): Richard Tremblay, Florence Copper, Inc.
Dave Dunaway, ADEQ