

Meeting Minutes

**Engineering/Minerals
Tonto National Forest
Phoenix, AZ**

To: Project Record

From: Donna Morey, SWCA

Re: Resolution Water Workgroup Meeting #6 6/25/2020

Attendees:

USFS: Mary Rasmussen

SWCA and subs: Chris Garrett, Donna Morey, Nick Enos, Gabi Walser, Carl Mendoza, Mark Williamson,

Resolution and subs: Greg Ghidotti, Vicky Peacey, Cameo Flood, Gustavo Mesa-Cuardo, Kate Patterson, Jim Butler, Matt Wickham, Chris Pantano, Ted Eary, Tim Bayley

AGFD: Jim Ruff

San Carlos Apache Tribe: Jim Wells

ADWR: Bret Esslin

USACE: Mike Langley

ASLD: Aundrea DeGravina

EPA: Hugo Hoffman

ADEQ: Wayne Harrison

Handouts:

Agenda (1pg)

Action Item list (3pg)

Discussion:

Welcome and Rollcall

- Hugo asked if we could add Nitrates to today's agenda. Yes, it will be discussed today.
- No other new items to add to the agenda. It is noted by Jim Ruff that it may be difficult to comment on reports not seen yet but being presented to. Yes, this concept will be further discussed on how to receive comments when we discuss the action items.
- Status of project: about 8 months since public comment period closed and about 6 months with trying to finish off analysis tracks to answer those comments. The NEPA team is now turning to focus on response to comments and EIS edits as the analysis tracks are winding down.
- Jim Wells asked for schedule on the Final EIS. The schedule is at the discretion of the forest supervisor but the NEPA team is working to have it ready to publish by the end of the year. There are many other processes that are also ongoing and need to come to fruition for the FEIS to publish and all are being tracked at this time.

Action Item List

- WR-1: plan is to show there was lots of expertise in the room, for agencies we will plan to list agency/name/and staff title rather than an agency.

- WR-10: received in June and it has been rolled out to various groups to review different portions. The NEPA team will compile the various reviews into one single review document. Chris envisions a new section in 3.3 on the reclamation and closure planning.
- WR-15: not yet completed but do have all the information we anticipated.
- WR-15a: BGC working on a memo to describe the information received
- WR-18: almost complete, have received the information requested. Should be provided to workgroup after 7/4 holiday.
- WR-20: will be presented to this group today, RCM did not intend to provide a written response, but to instead submit the PPT shown today with a cover letter on how it fits into the process.
- WR-25: received information, WR-25a added as the BGC memo to summarize and that memo is in process.
- WR-28: rescinded due to change approach to showing impacts as presented in May with quality/concentrations disclosed prior to intermixing with Gila River.
 - This does leave the other alternatives, but Chris envisioned a way to answer that with Alternative 5 with existing information. May ask for further RCM information if unable to find an answer.
 - Alternatives 2, 3, and 4 would not meet surface water standards even with mixing with Queen Creek, so meeting prior to mixing would not occur either. Chris does not feel there is enough data at Whitlow Ranch Dam to do the same analysis that is done for the Gila River. There has also been another analysis/discussion on impacts to Queen Valley that will be added to the EIS.
- WR13, WR-14, WR-29: WR-13 is Resolution/WSPs responses to Prucha, WR-14 is the NEPA team/BGC responses to Prucha, and WR-29 is the compilation of all the comments as a white paper that shows the direction we are headed on these modeling issues. If there is a July meeting, we ask that the work group members review the white paper and bring any concerns with the approaches taken by that meeting.
- White Paper (attached to meeting notes but no action items) is to better describe the model output shown in the EIS.
 - Comments can be submitted in writing/email prior to meeting or brought up at the July meeting. Jim Wells and Jim Ruff both feel it would be good to discuss at the July meeting.
- Memo recapping the work group – will there be a place for dissenting opinions. Yes, there will be two documents for the project record. The first is the proceedings memo (WR-2) just the facts to document when we had meetings, what was asked for and when we got it for the entire workgroup from 2017 through current. The 2nd memo will be a finalized BGC memo on the work group wrap up that has been revised to incorporate the discussions heard in 2020 work group meetings and will be have a location for dissenting opinions. There will be discussion on each dissenting opinion on why decisions were made for analysis and disclosure for the EIS. It was mainly focused on the water model but could either include water quality or stormwater concerns in that same memo or a separate memo.

Stormwater Release Scenario ** PPT will be provided as a data submittal from Resolution in the next week – the slides are not provided as part of the notes package as they have not been submitted **

- Introduction to this topic: Comments on surface water quality were distributed to the work group. Some of these comments asked if discharges were missed under the AZPDES permit and that has been documented by Resolution and is within the project record. Contact water will not be released during life of mine; and after mining, stormwater would be contacting reclaimed areas and not be considered contact water. There is one type of event that could release contact water from spillway during operations and is will be our topic today as a response to WR-20. This is a framework based on current level of design, not a fine prediction of modeling with 100% guarantee. Resolution will present this information to the workgroup today, answer questions and adjust the presentation if needed based on today's discussion. The PowerPoint presentation and a cover letter are envisioned for the deliverable, not a specific report.
- TSF Design for stormwater management. Diversions around facility will be designed for 100-year 24 peak flow or volume without pumping, overflow would report to TSF. Diverted catchment around seepage collection pond (SCP) is designed for 100-year 24 peak flow from the entire upstream catchment area and overflow would report to the SCP. TSF impoundment is designed and sized for greater than the 72-hour PMF assuming NO diversions from upstream catchments. The SCP 15' contingency is equal to one week of construction water if no pumps were running. Leakage and evaporation from SCP are considered but negligible.
- Considerations of Analysis - Two additional sub catchments are located below the TSF catchment up to the Gila River. Resolution analysis looked at flood durations between 1 – 30 days and return period between 300-year and 1,000-year events. In shorter storm events (less than 24 hr. events) the discharge is peaky with longer events have a larger volume. Assumption made that everything over a 100-year 24-hour peak flow would report to the SCP. The diversions are designed to peak flows, but this analysis is considering volume. There is pumping in some of the diversions (active management) for low areas as part of the TSF design.
- Water Quality Predictions are based on concentrations, with no reactive chemistry, only dissolved chemistry and this shows a conservative system. There are two standards – Fixed and hardness dependent. They used the minimum standard for chromium.
- Discussion on a Half Life type concentration amount used in analysis - Concentrations are building solutes while sitting with the rain event washing off those solutes, on the subsequent day of rain, there concentrations to be washed off – showing a concentration decrease with time. It is also similar in thought to a mixing model, as technically copper does not have a half-life and maybe difficult to consider in that way. The concentration of 1 day was determined was assumed to decrease by each day of the storm by following a half-life approach. No other duration was provided by comments or workgroup members to better evaluate the duration than “1 day and 50% reduction.” This is a point of uncertainty with the assumption. It would be difficult to process the humidity cells for this information as those are rinsed weekly after being allowed to dry. The batch tests have issues when understanding the mass of material between lab results and field situation. The analysis was ran with constant concentrations, no decline as a function of recurrence interval or storm duration.
- Slide 17 adds additional information to the inputs used in the analysis. Year 21 is mid-year in mine life and when cooper concentrations had reached a steady maximum. Embankment seepage (without SW mixing and have higher concentrations) is used rather than what would report to the SCP. Dry spring sampled right after a storm event as a surrogate for stormwater

runoff. Pumping of GW is constant across the life of mine. Construction water is a larger inflow than GW pumping.

- Assuming all water reports to SCP rather than inflow or evaporation. The assumptions are considered “conservative” because there is more construction water (not dilution) resulting in a larger volume of water that would be discharged over spillway.
- Results are looked at across multiple locations including just after SCP, just after confluence of Silver Creek, and just prior to entering the Gila River. In no analysis was overflow from SCP spillway seen in 30-day events. Acute standards were used, not chronic. Only predicted constituent of concern with a standard is copper, therefore the only one predicted in these results.
- The SCP is planned to be managed as low as possible, designed with a sump to pump and keep at under 5' level. If pumps were to be offline for one week – it would raise the 15' level.
- This analysis is considering during Operations, not post closure. Post closure we have a reclaimed surface and a diversion sized to PMF, downstream is reclaimed and has diversion channels, with drastically reduced inflows as no more construction ongoing, and risk of spilling into the SCP is reduced. This analysis is applicable only to operations, not post closure. The largest input of tailings is for the embankment runoff which would be reclaimed in post closure and the Gila cover has lab results to understand how water will react.
- What is the upset condition – SCP is maintained at 5' or less and will pump into PAG cell. A 15' pond is an upset condition (1-week downtime of pumps all going into SCP to get it to 15') and the storm contingency on top of that. That is also why we started results at 300-year event as the 200-year event would be contained within the design.
- How was PMF determined? TSF is designed for probably maximum storm, AZ has a GIS tool to input catchment for modeling of PMP values for various storm scenarios, assumed runoff coefficient is 1 at this level of design and the entire precipitation reports to the pond.
- The group was thankful for the presentation and the revised slides should provide good information for the disclosure and responding to comments by the NEPA team. Jim would like these PPT slides.

Other Water Quality Questions

- Nitrate – How is mass balance determined and where it goes for tailings seepage? EPA wants to ensure nitrates are not underrepresented in surface water.
 - The nitrate calculation begins with tons of rock blasted per year out of block cave and multiplied by the powder factor (provided by Resolution). Residual of 5% that leaches readily and becomes part of the soluble load (based on literature review) it provides both ammonia and nitrate, with assumption that ammonia converts to nitrate that gets carried out with the ore ending up at West Plan for ore processing where the nitrate is distributed into the tailings based on the load out of mine. Calculations are based on mass coming out of the mine and then dissolved into amount into water but then mixed at concentrator with ore moisture, sump water, reclaim water, and fresh make up water. There is no accounting for volatilization, assumed it is to stay as nitrate. Blasting amounts for this mine is less than some other mines as you have 6,000' of downward rock pressure so not as much blasting needed.

- This is a complicated calculation, new action item for Ted Eary to document inputs and equation that are currently spread across multiple reports. This can be submitted as a clarification to existing WR-20.
- The work by Ferguson and Leask seemed to be the most referenced and used method. No other methods were provided in comments or by workgroup, open to new method if one can be provided.
- Timing of Deliverables: Conceptual model report is in RCM review now, should be to workgroup next week. The report on last round of aquifer data collection should be few days behind that with the modeling report submitted within 2 weeks. Separate report from Kate on 1D modeling with seepage controls detailed for M&As model – should get tomorrow
- Seepage through Faults at TSF? Dripping springs fault runs below the TSF and does have higher connectivity in model for that feature. There is some seepage shown along the fault in model, but no exceedances as the finger drains are effective at capturing what would be seepage before it enters the GW system, to keep POC free from exceedances.
 - Kate’s memo describes seepage as required per BADCT; Tim presented on the connectivity of the fault that is similar to the Gila Conglomerate, but is not the same at all locations. The fault has not been drilled in the TSF but the wells closer to the faults have higher connectivity than those further away at the TSF. Downstream of the TSF they have drilled the fault. The engineering controls limit the seepage making it into the fault to avoid the aquifer is preference. If it does show a preferential pathway, it could be used as a place to pump from (as seen in one drill site downstream)

July 30th Wrap Up meeting Agenda – people need more time to review the skunk camp water quality modeling report which looks to only be about 2 weeks at this point on deliverables schedule. Mary feels 5 weeks out for a meeting should be sufficient time to review the information if Resolution provides as scheduled.

- Mitigation and Monitoring – please come prepared to talk about the M&M whitepaper circulated on 6/23.
- Comments from workgroup on mine site GW model response – please come prepared to discuss comments, or send in early for the whitepaper circulated on 6/21
- Workgroup feedback on
 - WR-20 Stormwater
 - WR-30 Skunk Camp Water Quality model reports (3 M&A, 1 KCB)
 - WR-31 new figures from WSP

Next steps

- SWCA needs to review these reports, workgroup comments and write response to comments for DEIS.
- If any questions arise during review of documents, please forward them to Chris Garrett at SWCA and he will funnel to the right people for efficiency.
- Hugo wants to look back at his DEIS comments to make sure the workgroup has addressed his comments
- The forest will review the response to DEIS comments and those will not be part of the review of the water work group.

Action Items:

1. Kate Patterson to update presentation to add storage capacity of SCP 660-acre feet and storage curve. Update callouts on Slide 15 for 1,000 rather than 500
2. Matt Wickham to add rationale for half-life assumption to presentation
3. Ted Eary to clarify nitrate inputs and calculation for WR-20
4. Donna Morey to send calendar invite for July 30 – should be final work group meeting
5. SWCA to circulate received action items as fast as possible

Agenda

To: Attendees, Project File
From: Chris Garrett, SWCA
CC:
Date: 6/25/2020

Re: Resolution Copper Mine – Water Resources Workgroup #6 – 6/25

Call-in Number: +1 (669) 900 6833; Meeting ID: [REDACTED]

Meeting URL: <https://swca.zoom>. [REDACTED]

1. Welcome and roll call
2. Recap of action items
3. Stormwater release scenario [WR-20]
4. Follow-up questions on water quality presentation from 5/28
5. Next Steps – Plans for July 30[?] meeting

DRAFT ACTION ITEMS

Date Assigned	Action Item	Resolved
1/23/2020	WR-1 (ALL): Provide resumes and quals for project record	Ongoing – will finalize with agency/position for those staff members. Resumes for others
1/23/2020	WR-2 (SWCA): Produce “Proceedings” process memo to document all data requests, data submittals, and workgroup actions (pre-DEIS and post-DEIS)	Ongoing
1/23/2020	WR-3 (SWCA): commit to sending the meeting notes prior to the next meeting	Continual
1/23/2020	WR-4 (SWCA): notify the group of substantial updates to documents (i.e. process memo living docs)	Continual
1/23/2020	WR-5 (SWCA): provide access to a SharePoint site to members of the workgroup and provide the technical reports and BGC report	Continual
1/23/2020 [COMPLETE]	WR-6 (RCM): Updated water qual, water data for long term around mine site/springs, water level, stream length (approx. 2016 – 2019) likely raw database not a report, (early March)	Received 4/7/2020; circulated to workgroup 4/9/2020
1/23/2020 [COMPLETE]	WR-7 (RCM): Summary & data for water quality, water level database for Skunk Camp & Gila River – report or database (early March) includes wells downgradient & other springs	Received 5/1/2020; circulated to workgroup 5/19/2020
1/23/2020 [COMPLETE]	WR-8 (RCM): Skunk Camp modeling presentation – March 26 Water working group	Conducted 5/28/2020
1/23/2020 [COMPLETE]	WR-9 (RCM): Springs Inventory 3.0 (April)	Received 4/22/2020; circulated to workgroup 4/23/2020
1/23/2020 [COMPLETE]	WR-10 (RCM): Closure and reclamation information, cover design – not ready yet/optional for this working group, but will be included for Closure working group	Received 6/12/2020; circulated to workgroup 6/16/2020
1/23/2020 [COMPLETE]	WR-11 (RCM): ESRV cumulative effects modeling (early February) include presentation in February	Report submitted by RCM 1/24/2020; circulated to workgroup 1/27/2020
1/23/2020 [COMPLETE]	WR-12 (RCM): pull well records and other information for QV and think of ways to model the impacts	Received 4/22/2020; circulated to workgroup 4/23/2020

Date Assigned	Action Item	Resolved
1/23/2020 [COMPLETE]	WR-13 (RCM): RCM to get written responses to Prucha comments/criticisms from Resolution modeling team. Those would be distributed to the Water working group so we can better discuss in the next meeting.	Received 3/23/2020; circulated to workgroup 3/25/2020
1/23/2020 [COMPLETE]	WR-14 (SWCA/BGC): Screen thru Prucha report/comments and respond with previous background information from the BGC draft model review document	Received 5/11/2020; to be circulated with WR-29
2/20/2020	WR-15 (M&A): Will investigate possible analytical tools or an approach to evaluate the local subsidence issue in or near the desert wellfield. [COMPLETE] WR-15A (BGC): Prepare memo to consolidate and review information	Resolution presented on 4/23; BGC memo in progress
2/20/2020 [COMPLETE]	WR-16 (RCM): Provide usage numbers for ESRV for comparison to RCM pumping	Resolution presented on 4/23; received 5/30; circulated to workgroup 6/2
2/20/2020 [COMPLETE]	WR-17 (TNF): Follow up with ADWR on ESRV model update approval.	Received 4/9/2020
2/20/2020	WR-18 (BGC): Review SRV model and purpose memo on M&A extension and appropriateness of model WR-18A (RCM): Minor additional model output requested	Received draft 5/26/2020; not yet circulated pending finalization after receipt of RCM model output. Additional output received from RCM 6/21/2020; BGC finalizing report
2/20/2020 [COMPLETE]	WR-19 (RCM): Resend September 2019 powerpoint	Received 3/17/2020; circulated to workgroup with meeting notes
2/20/2020	WR-20 (RCM): Provide input on potential for stormwater release and estimate of quality. Focus on operations.	In progress – will present on 6/25 – Circle back at end of day
2/20/2020 [COMPLETE]	WR-21 (M&A): Estimate remaining water in aquifer at several snapshots in time.	Resolution presented on 4/23; received 5/30; circulated to workgroup 6/2
3/26/2020 [COMPLETE]	WR-22 (RCM): Information on modeled gradients near block cave over time; verify hydraulic containment will occur	Received 4/22/2020; circulated to workgroup 4/23/2020

Date Assigned	Action Item	Resolved
3/26/2020 [COMPLETE]	WR-23 (RCM): Kate send contingency information for Design of Facility able to handle varying percentage split between pyrite/scavenger tailings.	Received 5/26/2020; circulated to workgroup 6/2
3/26/2020 [COMPLETE]	WR-25 (RCM): <ul style="list-style-type: none"> • provide previous water submittal that should provide examples of analog design features • possibly add additional water closure projects that could also be analogs in arid environments, if any • provide discussion on how tailings are managed/tested during operations based on Kennecott 	Received Part 1 on 4/7/2020; circulated to workgroup 4/9/2020 Additional information on Part 1 received 4/17/2020; circulated to workgroup 4/21/2020 Final piece received 5/30; circulated to workgroup 6/2
6/25/2020	WR-25A – finish memo	Underway by BGC
3/26/2020 [COMPLETE]	WR-26 (M&A): provide GIS layer of springs and wells	Received 5/13/2020; circulated to workgroup 5/19/2020
4/23/2020 [COMPLETE]	WR-27 (RCM): Document current conditions and expected conditions of discharge under AZPDES and exploration of discharges during transitional times of mine life.	Received 6/11/2020; circulated to workgroup 6/16/2020
4/23/2020 [RESCINDED]	WR-28 (M&A): Determine low flow from 7Q10 for low flow and how that would affect over median flows. Minimum for Alt 6, maybe for Alt 5.	Based on Skunk Camp modeling approach presented 5/28, this request is no longer applicable.
4/23/2020 [COMPLETE]	WR-29 (SWCA): Distribute BGC Prucha responses for consideration with WSP Prucha responses; categorize comments for future discussion	Circulated to workgroup 6/21/2020
5/28/2020	WR-30 (M&A): Submittal of Skunk Camp conceptual and predictive modeling reports	Model report – 1 week Data – few days after that Model report – 1.5 weeks after data Kate’s report (m&a inputs) this week
6/20/2020	WR-31 (WSP): Additional modeling output requested in whitepaper assessing Prucha comments	
6/25/2020	WR-32 (SWCA): Consider need for an additional memo on modeling of stormwater or water quality compared to the BGC memo on groundwater model	NEW
6/25/2020	WR-33 (RCM): Nitrate calculations and inputs with references	

