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Testimony before House Natural Resources Subcommittee on
Indigenous Peoples of the United States
Hearing on the Save Oak Flat Act, H.R. 1884
April 13, 2021

I would like to thank Chair Grijalva, Chair Fernández, and members of the House Subcommittee for Indigenous Peoples of the United States for inviting me to testify at this hearing about the Save Oak Flat Act, H.R. 1884. I urge members of Congress to support this legislation because of the profound and irreparable cultural and environmental impacts that would ensue if the proposed Resolution Copper Mine were allowed to be developed. I also urge USDA to fully withdraw the current EIS for this project so a more complete analysis of alternatives can be performed. I am not anti-mining. However, copper is not a particularly rare commodity. We do not need to green-light every mining project if the cultural and environmental costs are too high, as they are for this project.

This is a project that could not meet the rather low bar required for mining on federal lands. For 150 years, the United States has promoted mining on federal lands. The 1872 Mining Law was written to encourage development of the West. It contains substantial incentives for private companies to mine on federal lands, including charging no royalties for extracting these public resources and generally defining hardrock mining as the "highest and best use" of public lands regardless of competing land uses such as recreation, logging, hunting, grazing, or cultural uses. Special legislative action was needed to make this project possible in the form of Section 3003 of the Carl Levin and Howard P. "Buck" McKeon National Defense Authorization Act for Fiscal Year 2015 (NDAA). The Save Oak Flat Act would reverse special treatment for the international mining companies, Rio Tinto and BHP through their joint venture limited liability company, Resolution Copper, and restore protections for Oak Flat that had been in place for over 65 years.

As technologies advance, we ask auto companies to build cleaner cars. We ask power plants to reduce emissions. Shouldn't we be asking the same of mining? A mine like Resolution will have <u>greater impacts</u> on the environment compared to most copper mines in the U.S. due to the choice of mining methods. As shown on Figure 1, in addition to tailings (which are inevitable regardless of mining method employed), Resolution is insisting on destroying a vastly greater

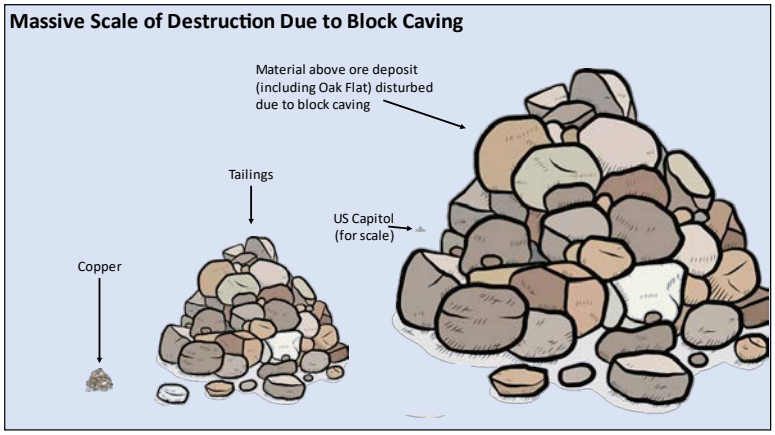


Figure 1. Relative volumes of copper, tailings and material above ore deposit that would be disturbed due to block caving at the Resolution Mine. US Capitol is shown for scale.

amount of Arizona landscape (including Oak Flat). This huge volume of rock and its aquifer would be disturbed and a large swath of landscape would be destroyed, not because this material has any value to Resolution, but rather because it is more convenient and more profitable to use block caving.

Background and Qualifications

I am a Registered Geologist and I have been a practicing environmental geologist for nearly 30 years. My Bachelor's Degree is from Dartmouth College and my Masters' and PhD degrees are from the University of Washington in Seattle, all in Geological Sciences. For the last seven years, I have advised the San Carlos Apache Tribe on environmental and water resource matters related to the proposed Resolution Copper Mine, as well as other matters.

At the invitation of the US Forest Service, I served on the Groundwater Modeling Workgroup which advised Tonto National Forest on its preparation of the Draft Environmental Impact Statement (DEIS), using complex groundwater modeling methods to predict water and ecosystem impacts from the proposed mine. The working group consisted of Forest Service and Resolution Copper personnel, as well as professionals from stakeholder agencies such as US Environmental Protection Agency, US Geological Survey, Arizona Game and Fish, and Arizona Department of Environmental Quality. Also, at the invitation of Tonto National Forest, I was also a member of the Resolution Copper Mine Water Resources Working Group which advised the Forest Service on its efforts to respond to public comments on the DEIS. For context, of roughly 30,000 comments submitted to the Forest Service on the DEIS during the public comment period, approximately 20% of the substantive comments related to water resources or water quality, demonstrating the public's deep concern about this issue.

The EIS prepared by Tonto National Forest identifies a number of profound environmental impacts from this project that cannot be mitigated. The scale of this project is hard to fathom and unfortunately the Forest Service fell short of its obligation under NEPA to take a hard look and ensure scientific integrity in its evaluation of these environmental impacts.

Mine Would Create Massive New Water Demand in Desert Region Already Experiencing Water Shortages

The mine will consume enough water to supply a city of 140,000 people every year for 50 years. This is a vast new water demand for an area of the southwest that is already experiencing water shortages. Resolution's water use could be much higher than they are disclosing. The current estimate (accepted at face value by the Forest Service) promises that this mine will use about 1/3 of the average water (per ton of ore) as existing copper mines in the United States. This highly optimistic estimate is largely based on Resolution's assurances that it can implement significant and unproven water-saving procedures in its ore processing and tailings handling operation.

Even if one accepts Resolution's highly optimistic estimate for water usage, the mine will use about 775,000 acre feet of water over the life of the mine[1], of which approximately 70% will be pumped from a large network of new extraction wells in the East Salt River Valley. 775,000 acre feet equals 250 billion gallons of water. It is hard to visualize the immensity of this amount of water. A football field covers about one acre, so if the water Resolution plans to use was stored in a tank the dimensions of a football field, such a tank would need to be 147 miles high to accommodate all the water. The Salt River upstream of Phoenix is about 100 feet wide and 5 feet deep. For a river the size of the Salt River to hold the amount of water required by this mine, it would need to be more than 12,000 miles long, extending halfway around the world.

Arizona does not have enough water to accommodate this large new demand. Resolution's proposed Desert Wellfield is in the Phoenix Active Management Area (AMA) and is just north of the Pinal AMA. Active Management Areas were created by the state to better manage aquifers in parts of the state that were experiencing depleted groundwater resources. In an October 2019 study of the Pinal AMA, Arizona Department of Water Resources (ADWR) identified a future unmet demand of 8.1 million acre-feet.[2] Tens of thousands of people in Pinal County rely on groundwater for their water supply and already, private wells are drying up.[3]

There is simply not enough water to go around. In the Phoenix AMA, there are many municipalities and commercial operations that rely on groundwater from the very same basin that Resolution will be pumping from, including Phoenix, Scottsdale, Tempe, Mesa, Gilbert, Chandler, Apache Junction and other towns. Arizona's goal for the Phoenix AMA is to achieve safe yield by 2025. For a groundwater basin, "safe yield" means achieving a long-term balance between the annual amount of groundwater withdrawn and the annual amount of recharge, thus avoiding depletion of the aquifer. Even without Resolution's pumping, the Phoenix AMA has not achieved safe yield and cannot meet the 2025 goal. In its latest study, the Arizona Department of Water Resources predicted demand to exceed supply into the foreseeable future for this basin and also predicted irreversible loss of aquifer capacity due to overpumping.[4]

The Arizona State Land Department has determined that Resolution's groundwater withdrawals in the East Salt River Valley would cause a loss development potential for 3,440 acres of State Trust Land in the Superstition Vistas Planning Area, representing a "minimum

[1] FEIS, Appendix H, Table H-3. This is the volume of water estimated to be needed over the life of the mine for TSF Alternative 6, Skunk Camp, which is the Forest Service's preferred alternative.

[2]Arizona Department of Water Resources, 2019 Pinal Model and 100-Year Assured Water Supply Projection Technical Memorandum.

[3]ABC15 News, Private Wells Running Dry in Pinal County, Oct. 24, 2019; https://www.abc15.com/news/region-central-southern-az/private-wells-running-dry-in-pinal-county.

[4]Arizona Department of Water Resources, 2010, Modeling Report #22, A Salt River Valley Groundwater Flow Model Application. 100-Year Predictive Scenarios Used for the Determination of Physical Availability in the Phoenix Active Management Area.

potential loss to the Trust of at least $536,640,000 in revenue."[5] The reason for these profound losses is that other entities wishing to use groundwater in the Phoenix AMA must demonstrate a 100-year Assured Water Supply in order to secure project approval. After Resolution takes all the groundwater it needs, there is less groundwater in storage for other potential users. By green-lighting this mine, the people of Arizona are embarking on an uncontrolled experiment on social priorities pitting the state's agricultural, municipal and tribal interests against those of a multinational mining company and the mining company is winning.

Rush to Finalize the Environmental Impact Statement

The FEIS was published on January 15, 2021, but Tonto National Forest later withdrew it on a temporary basis on March 1, 2021. The Forest Service chose to focus the EIS on evaluating different locations for the waste tailings. Considering this focus, it was surprising that the DEIS was issued without a competent evaluation of the geotechnical suitability and water quality impacts of Skunk Camp, the preferred Tailings Storage Facility (TSF) site. To make up for these omissions, Resolution embarked on substantial field investigations and computer modeling efforts, generating a large body of new information after the Forest Service issued the DEIS. This new information consisted of at least a dozen new studies and reports totaling thousands of pages that are relevant to environmental concerns. In particular, there is substantial new groundwater modeling work to evaluate the cumulative impacts to groundwater resources in the East Salt River Valley, site of the proposed Desert Wellfield where much of the water required by the mine would be pumped. Additionally, voluminous new studies of water quality impacts from the Skunk Camp TSF and a brand new assessment of possible surface water discharges from the mine operations under Resolution's AZDEPES permit have been prepared. All of this information was developed after publication of the DEIS, was not subject to public review or comment, and was not adequately analyzed by Tonto National Forest to determine whether this new information could impact the preferred alternatives or mitigation measures set forth by Tonto National Forest in its FEIS.

Computer modeling in the EIS acknowledges that cumulative effects of Resolution's pumping along with other known demands in the East Salt River Valley are likely to result in a drop in groundwater levels of approximately 450 feet in parts of the Phoenix AMA. The computer modeling **did not** include any of the water demands resulting from future development in the Superstition Vistas Planning Area. This outcome would be profoundly contrary to the long-stated goal of the state to achieve safe yield in this groundwater basin. There is no serious analysis in the FEIS of potential mitigation measures from this impact on the state's water resources. Instead, the Forest Service noted that the state was likely required to grant Resolution a permit to withdraw groundwater for mineral extraction, as this is a non-discretionary permit under Arizona law provided certain conditions are met.[6] The EIS further stated that "By

[5]Arizona State Land Department, November 7, 2019 Letter to Neil Bosworth, Tonto National Forest. (Reproduced on p. R-43 of FEIS).
[6] FEIS, p. 971.

definition, Resolution Copper's legally permitted use of water adheres to the norms and values placed on water by the State of Arizona." This is hardly the "hard look" at environmental impacts that is required under NEPA. Arguably, it is not adhering to the values of the State of Arizona to greenlight a project that is guaranteed to deplete scarce groundwater resources in the East Salt River Valley.

In addition to the failure to analyze cumulative impacts to water resources, Section 3003 of the FY15 NDAA created special requirements for the environmental review of this project. Specifically, it called for a single environmental impact statement and it required the USDA Secretary to engage in a collaborative process with affected Indian tribes to "(i) address the concerns of the affected Indian tribes and (ii) minimize the adverse effects on the affected Indian tribes resulting from mining and related activities."[7] Considering that the end result of this process would be the "eradication" of sacred springs and destruction of Oak Flat, it is legitimate to say that this requirement of Section 3003 has not been met. To fully comply with NEPA and the special requirements imposed in Section 3003 of the NDAA, the current EIS for this project needs to be withdrawn and the EIS process needs to start anew.

Without the Save Oak Flat Act, the Land Exchange will take place and Resolution Mine will be built. Some of the irreversible impacts from this project are summarized below.

Cumulative Impacts on Water Resources

Resolution Copper Mine will obviously require a vast amount of water in a desert region that is already experiencing water shortages. Arizona water law grants exceptional leeway to mines, which are essentially unregulated water users. As such, Resolution Copper may be entitled to develop a virtually unlimited number of wells and pump an unlimited amount of water from the East Salt River Valley. The Forest Service's preferred alternative TSF locating the tailings dump at Skunk Camp calls for pumping about 775,000 acre-feet of water over the life of the mine[8] (of which 540,000 acre-feet would be from the Desert Wellfield and the remainder would mostly be supplied from dewatering of the mine site itself). The water proposed for withdrawal from the Desert Wellfield is a substantial amount of pumping, representing about 6.7 percent of the total available groundwater in the East Salt River valley

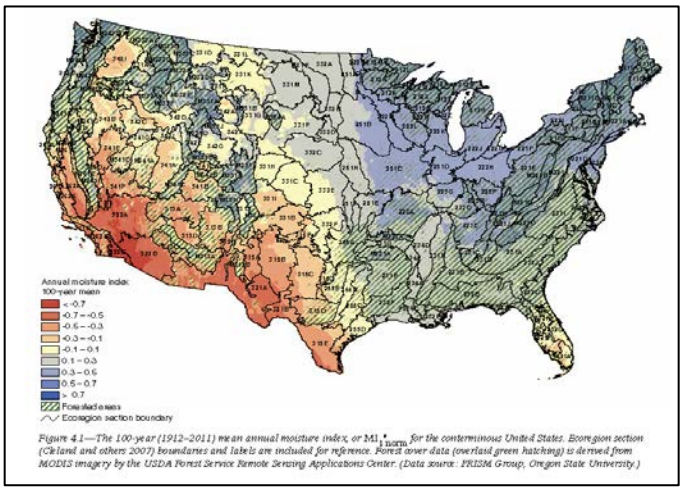


Figure 4.1—The 100-year (1912–2011) mean annual moisture index, or $M1^{*}_{norm}$, for the conterminous United States. Ecoregion section (Cleland and others 2007) boundaries and labels are included for reference. Forest cover data (overlaid green hatching) is derived from MODIS imagery by the USDA Forest Service Remote Sensing Applications Center. (Data source: PRISM Group, Oregon State University.)

Figure 2. USDA 100-year moisture index, showing much of Arizona has a moisture deficit, even when averaged over 100 years. Source, USDA, 2012, Forest Health Monitoring: National Status, Trends and Analysis.

[7] NDAA, Section 3003, (c)(3)(A) and (c)(3)(B).
[8] FEIS, p. 48.

subbasin.[9] The EIS analysis of past, present and reasonably foreseeable future regional water impacts is inadequate. In some ways, disclosures in the FEIS are even less informative than the DEIS. In the DEIS, the Forest Service acknowledged that "groundwater demand is substantial and growing" and "total demand on the groundwater resources in the East Salt River Valley is substantial and could be greater than the estimated amount of physically available groundwater" (DEIS, p. 342). These sober assessments inexplicably do not appear in the FEIS.

As shown on Figure 2, the Forest Service's own research shows that Arizona has experienced moisture deficits even when averaged over the last 100 years. Colorado and other parts of the desert Southwest remain in an almost perpetual drought. A 2017 Report to Congress noted that the Colorado River, source of critical water supplies to Arizona via the Central Arizona Project or "CAP", has experienced lower-than-normal flows for the past 16 years, with some of the lowest annual flows in 900 years. The Report to Congress also noted that recent studies on the effects of climate change suggest that "a transition to a more arid average climate in the American West" may be under way. Likely consequences of climate change include higher temperatures in the West, higher evapotranspiration, reduced precipitation, and decreased spring runoff.[10]

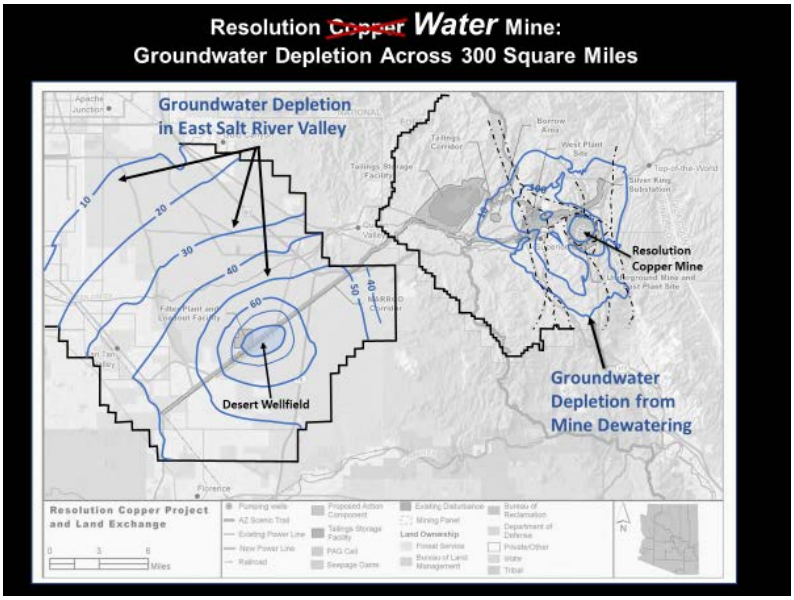


Figure 3. Map showing predicted groundwater drawdown from mine dewatering and from the Desert Wellfield. Sources: Base Map: DEIS, Figure ES-2; Desert Wellfield drawdown contours redrawn from DEIS, Figure 3.7.1-2 (Desert Wellfield modeling analysis area and maximum modeled pumping impacts); Mine model contours redrawn from WSP, October 31, 2018, Memo: Resolution Copper Groundwater Flow Model – Predictive Results, Figure 5 (Regional Groundwater Model Predicted Drawdown-Proposed Action Post Closure (Year 200); Faults are redrawn from WSP, February 2019, Resolution Copper Groundwater Flow Report, Figure 2.1 (Regional Geology Map).

The FEIS fails to evaluate "reasonably foreseeable future" Colorado River shortages and cuts, as well as the events that will be triggered under the Drought Contingency Plan once the inevitable shortages occur. It also fails to look at the project's impact on regional water resources when combined with these shortages.

Regional Groundwater Impacts

Resolution's own assessment acknowledges that groundwater will be depleted by at least 10 feet (and in some places, more than 1,000 feet) over an area covering about 300 square miles. As shown on Figure 3, this is a consequence of dewatering

[9]FEIS, p. 418.

[10]Congressional Research Office, November 9, 2017, Drought in the United States: Causes and Current Understanding, pp. 14-15.

at the mine site as well as massive amounts of pumping that will occur in the East Salt River Valley, about 15 miles west of the mine. No one knows how long it will take for the aquifers to recover after the mine closes, but Resolution once estimated that it would take about 1,000 years. According to the Forest Service, "Analysis of the economic value of the water used by Resolution Copper, the other beneficial uses to which water could be put, or extrapolation of economic harm to other entities due to Resolution Copper's legally permitted use of water, is outside the scope of analysis of this EIS."[11]

Land Subsidence in East Salt River Valley Due to Groundwater Pumping

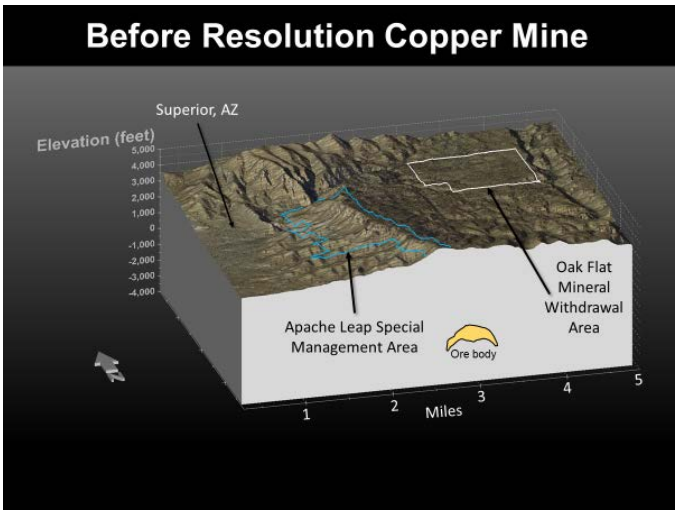
The Forest Service did not conduct an analysis in the DEIS of land subsidence resulting from groundwater withdrawal, claiming such analysis was not feasible. However, in the FEIS, there is an analysis of land subsidence, noting that "drawdowns associated with the Desert Wellfield likely would result in subsidence of roughly 24 to 52 inches."[12] This information was not disclosed in the DEIS and was not subject to public review and comment. This newly quantified environmental impact is important because land subsidence due to groundwater pumping causes a permanent reduction in the storage capacity of an aquifer. This means that even after the drawdown recovers from Resolution's pumping, that portion of the aquifer in the East Salt River Valley will never hold as much groundwater again, thus constituting an unmitigable impact. Or, as admitted by the Forest Service, "An important aspect of subsidence is that it is irreversible; once sediment layers collapse when dewatered, they remain collapsed even if water levels recover."[13] As scientists and public officials know from other parts of the Salt River Basin as well as places like the Central Valley of California, land subsidence from groundwater pumping also causes harm to public infrastructure such as roads, pipelines and utility lines, as well as harming homes and other structures.

Impacts to Springs and Streams

The EIS acknowledges that "Sacred springs would be eradicated by subsidence or construction of the tailings storage facility, and affected by groundwater drawdown."[14] In the arid southwest, springs and perennial streams are extremely rare and constitute irreplaceable habitat. Use of groundwater that impacts springs and streams is contrary to Tonto National Forest's groundwater policy:

> "Groundwater shall be managed for the long-term protection and enhancement of the Forest's streams, springs and seeps, and associated riparian and aquatic ecosystems. Development and use of groundwater for consumptive purposes shall

[11] FEIS, p. 813.
[12] FEIS, p. 412.
[13] FEIS, p. 412.
[14] FEIS, p. 856.



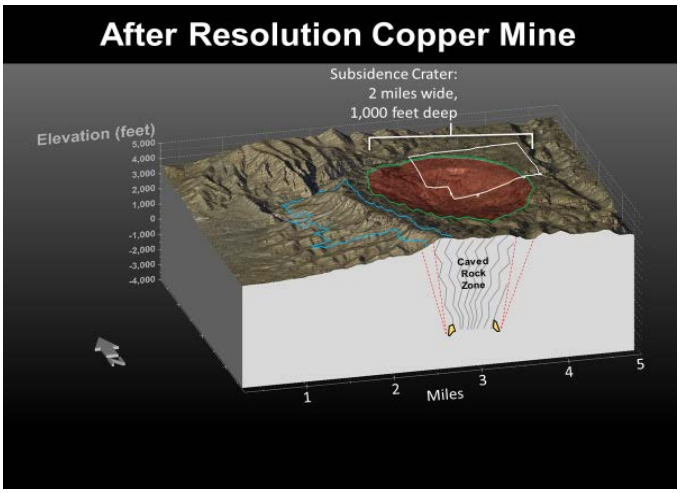
be permitted only if it can be demonstrated that such proposals will adequately protect Forest resources."[15]

Impacts from Block Cave Mining

Resolution chose to employ block cave mining because that's the cheapest way to mine this deep ore body. A consequence of this mining method is that reclamation or restoration is simply impossible: just a sturdy fence and maybe some "no trespassing" signs.

Once mining commences, the formation of a subsidence crater becomes inevitable and unstoppable. Even Resolution Copper cannot stop this process once it has begun. Further, after the land surface collapses into Resolution's mine, creating the 1.8-mile wide subsidence crater, the Apache Leap Tuff Aquifer will be altered forever, irreversibly and permanently altering the region's water resources. This is the very definition of an irreparable harm. As stated in the FEIS, "The deep groundwater system is being and would continue to be actively dewatered, and once block caving begins the Apache Leap Tuff would begin to dewater as well."[16]

The Apache Leap Tuff Aquifer is a critical source of water for springs and creeks, many of them sacred to Western Apaches. This permanent impact would not occur if alternative underground mining methods were employed, but the Forest Service did not conduct an adequate analysis of alternative mining methods largely because it accepted Resolution's assertion that any method other than block cave mining would be too expensive.



The EIS disclosed a number of profound impacts due to the collapse crater that cannot be mitigated, including

[15]Martin and Loomis, Keeping Our Streams Flowing: Tonto National Forest Groundwater Policy, in: Furniss, Clifton and Ronnenberg, eds., 2007, Advancing the Fundamental Sciences: Proceedings of the Forest Service National Earth Science Conference, October 2004, PNW-GTR-689, USDA, Forest Service, Northwest Research Station.

[16] FEIS, p. 369.

to scarce water resources. By failing to conduct an acceptable and competent evaluation of project alternatives that could avoid the impacts caused by the collapse zone, the Forest Service is allowing one factor (cost of mining: i.e., Resolution's profitability) to outweigh all environmental and social factors combined.

Mitigation of Impacts to Groundwater Dependent Ecosystems

The FEIS concludes that the Resolution Copper Mine project will or is likely to deplete water supplies and harm or destroy the streams, springs, seeps and other water features in Oak Flat, Ga'an Canyon (Devil's Canyon), Mineral Creek and Queen Creek: "Dewatering or direct disturbance would impact between 18 and 20 groundwater dependent ecosystems (GDEs), mostly sacred springs. While mitigation would replace water, impacts would remain to the natural setting of these places."[17] The proposed mitigation for GDEs is inadequate. Mitigation plans are outlined in a September 2020 report.[18] This report calls for replacing water flows in springs and creeks by pumping water from nearby wells (i.e., tapping groundwater from deeper in the aquifer), storing water in tanks and piping the water to the creek or stream or by constructing various water-collecting devices such as so-called "guzzlers," surface water capture systems or even trucking water in from alternative sources. Replacing a natural system with a manufactured facsimile of the system is not the intention of mitigation under NEPA. Just as it would not be permissible to replace the real Half Dome with a plaster model of Half Dome, it is not permissible to replace lost GDEs with artful but artificial copies of natural systems. It was not the intention of NEPA to replace nature with theme park-like imitations of nature.

The monitoring plan for GDEs is also inadequate because its discussion of triggers (i.e., occurrences or observations that would trigger mitigation activities) is vague and incomplete. The Montgomery Report[19] reveals that Resolution has built in (and the Forest Service has bought into) any number of ways to avoid actually implementing mitigation measures for GDEs. In particular, the Plan explains that Resolution will somehow differentiate the impacts from its dewatering from other variables such as "changes in weather and/or climate, impacts to the regional and/or local groundwater system from other human causes, landscape changes such as landslides and fires, natural succession of the GDE into a new presentation such as an increase in phreatophytic plants coincident with a reduction in spring flow rates, or other reasons not included in this document." Other than noting that Resolution will employ "multiple lines of evidence" there is no quantitative or qualitative discussion of how Resolution will accomplish this difficult task. Considering that most of the GDEs covered by the monitoring plan have already been identified as likely to be severely impacted by mine dewatering, Resolution's methodology for identifying impacts to GDEs is unworkable and is inadequate under NEPA.

[17] FEIS p. 156.

[18] Montgomery & Associates, 2020, "Monitoring and Mitigation Plan for Groundwater Dependent Ecosystems and Water Wells."

[19] Montgomery & Associates, 2020, "Monitoring and Mitigation Plan for Groundwater Dependent Ecosystems and Water Wells."

Water Quality Impacts-Acid Rock Drainage

As noted in the DEIS, "The deposit is associated with hydrothermal alteration and includes a strong pyrite "halo" in the upper areas of the deposit, containing up to 14 percent pyrite. This mineralization has ramifications for water quality, as sulfide-bearing minerals such as pyrite have the potential to interact with oxygen and cause water quality problems (acid rock drainage)".[20] Much of the mineralized halo (i.e., rocks with abundant sulfide minerals but a lower grade of copper) will not be mined out, rather it will become a permanent part of the collapse zone.

The FEIS makes the unsupported assumption that the mineralized, fractured rock in the collapse zone will not be in contact with oxygen, thus will not form acid rock drainage. This is a highly optimistic conclusion that defies common sense. As the collapse zone forms, the rock will dewater as it is transformed into a giant rubble heap, increasing its hydraulic conductivity many orders of magnitude. For the purposes of groundwater modeling, Resolution assumes that the hydraulic conductivity[21] of rock in the cave zone will increase by as much as a factor of a million: "Maximum hydraulic conductivity values were altered by a multiplier of 1E+6 or to a hydraulic conductivity of 100 ft/day, whichever occurs first…The maximum hydraulic conductivity value of 100 ft/day was selected because it is much higher than the natural, un-altered bedrock, but higher values caused the model to become unstable."[22] This statement highlights another deficiency of the groundwater model: hydraulic conductivity of rock in the collapse zone was arbitrarily limited to 100 ft/day because the model would crash if higher (i.e., more realistic) values were used.

Atmospheric air will easily penetrate the dewatered fracture zone, supplying oxygen into a subsurface environment that has been devoid of oxygen for thousands if not millions of years. This assumption (no oxygen thus no acid-generating reactions in to collapse zone) is incorrect and understates the environmental risks from acid rock drainage within the mine and in ore stockpiles. This assumption is also broadly inconsistent with Resolution's treatment of potentially acid generating (PAG) material in the tailings. In the tailings, Resolution acknowledges that PAG needs to be submerged under a layer of water to prevent contact with oxygen and minimize acid rock drainage. However, in the collapse pit, no such protection will exist, yet Resolution somehow concludes (and the Forest Service believed it) that acid rock drainage will not occur.

[20] FEIS p. 173.

[21] Hydraulic conductivity is a measure of how groundwater flows through an aquifer. This, in turn, affects the groundwater velocity through the aquifer. Solid rock has a very low hydraulic conductivity; sandstone has a higher hydraulic conductivity and very coarse grained sediments like gravels have even higher hydraulic conductivity.

[22] WSP, February 2019, Resolution Copper Groundwater Flow Report, pp. 37-38.

Water Quality Impacts from the Tailings Storage Facility

The scale of this project is hard to grasp, but the volume of tailings produced by Resolution Copper would fill the Rose Bowl to its brim, not once but nearly 1,800 times. This vast volume of waste material will permanently disturb 16,000 acres of land of which nearly 8,000 acres is Arizona State Land. The principal accomplishment of the EIS seems to be to propose a new location for the mine's 1.37 billion tons of tailings. Water quality impacts from the tailings is one of the most profound and concerning environmental issues for a mine of this size, yet there remains great uncertainty about the magnitude of water quality impacts from the TSF.

Tailings Dam Risk of Failure

Tailings would be transported through about 20 miles of pipeline across sensitive habitat–including Ga'an Canyon–to the Skunk Camp TSP in Dripping Springs Wash, a tributary of the Gila River. Over the life of the mine, the TSF would grow to cover 3,995 acres[23] of this watershed behind a three mile long earthen dam and tower as much as 500 feet – about as high as the Washington Monument -- above the natural land surface.[24] A failure of the tailings dam would put downstream lives at risk and would undoubtably contaminate the Gila River. The magnitude of impacts from large tailings dam failures can be immense. The tailings dam at the Fundão Dam in Brazil was much smaller than the proposed Resolution dam (about 300 feet tall compared to 500 feet at Resolution; Resolution TSF will ultimately have nearly 20 times greater volume of tailings). The 2015 Fundão tailings dam failure killed 19 people and contaminated hundreds of miles of the Doce River, eventually spewing a toxic plume of tailings into the Atlantic Ocean, more than 400 miles downstream of the dam.

Impacts to Apache Leap Special Management Area

There is a high degree of uncertainty in Resolution's subsidence predictions, but the public has been assured that the subsidence crater will not extend into the Apache Leap Special Management Area. True or not, it is certain that the subsidence zone will creep up the eastern slope of Apache Leap and profoundly degrade the quality of this theoretically protected place. In 75 years, if we could stand together on

[23] The direct footprint of the TSF would be 3,995 acres however, according to the FEIS, a total of 8,647 acres would be off-limits to the public due to tailings operations.
[24] FEIS, p. ES-21.

the crest of Apache Leap, instead of the world-class view across Oak Flat, we would see a massive pit of collapsed rock, just a couple hundred meters away, devoid of life & gradually filling with toxic mine water. Imagine standing on the stairs of the US Capitol and seeing nothing but a 1,000-foot deep rocky pit, starting at the Capitol reflecting pool, swallowing not only the Smithsonian Museums and the Washington Monument, but extending all the way to the Lincoln Memorial. That's how immense this subsidence crater will be.

Conclusions

Passage of the Save Oak Flat Act, HR 1884, is critical to stop this project that promises big profits to multinational mining companies, while imposing irreversible harm to the people and environment of Arizona. This mining project will have long-term consequences to the groundwater resources in Arizona as a whole and the Phoenix AMA,in particular, and, in some cases, permanent consequences. By pumping 176 billion gallons of groundwater from the East Salt River Valley, this project would make Arizona's goal for stewardship of its scarce groundwater resources all the more unreachable. Considering the effects of ongoing drought conditions and likely reductions in deliveries of Colorado River water to Arizona via the CAP, it is nearly certain that the new demand from Resolution's pumping of groundwater from the East Salt River Valley will lead to water shortages among the many users of this groundwater basin. Even more certain is the irreversibility of Resolution Copper's impacts to Oak Flat and the Apache Leap Tuff Aquifer which will be destroyed forever by the subsidence crater: permanently altering the region's water resources, causing local streams and springs to be "eradicated,"[25] many of which are sacred to Arizona Tribes.

[25] FEIS, p. 856.