December 16, 2015

Balaji Vaidyanathan
Air Quality Permits Section Manager
Arizona Department of Environmental Quality
1110 West Washington Street, 3415A-1
Phoenix, AZ 85007
Submitted via email to: tb4@azdeq.gov

Re: AIR QUALITY CLASS II SYNTHETIC MINOR PERMIT: Canyon Mine PERMIT 62877; EZ Mine PERMIT 62878; Pinenut Mine PERMIT 62876

Dear Mr. Vaidyanathan:

Please accept these comments from the Grand Canyon Trust, the Center for Biological Diversity, and Sierra Club's Grand Canyon Chapter regarding the Air Quality Control Permits for the Canyon, Pinenut, and EZ mines.

In addition, we request that the Arizona Department of Environmental Quality (ADEQ):

1. convene public hearings in Flagstaff and Tuba City, Arizona, communities through which the uranium ore will be trucked; and
2. extend the public comment period to at least one month beyond the current closing date of Jan. 4, 2016.

The Grand Canyon Trust has long advocated for protecting air quality in both urban and rural environments. Many of our members enjoy hiking, backpacking, wildlife and scenery viewing, and educational opportunities throughout the greater Grand Canyon area, including on the public lands in the areas for which these permits are proposed. The mission of the Grand Canyon Trust is to protect and restore the Colorado Plateau—its spectacular landscapes, flowing rivers, clean air, diversity of plants and animals, and areas of beauty and solitude. The Trust was established in 1985 and has 4,000 members. It is a regional conservation organization with offices in Flagstaff, Arizona and Moab, Utah.

The Center for Biological Diversity (the "Center") is a national, nonprofit conservation organization with more than 900,000 members and online activists dedicated to the protection of endangered species and wild places. The Center is actively involved in species and habitat protection issues worldwide, including throughout the western United States. The Center, its employees, and its members use the public lands subject to the proposed uranium mining for recreational, scientific, aesthetic, and commercial purposes. They also derive recreational,

scientific, aesthetic, and commercial benefits from the public lands through wildlife observation, study, and photography. The Center and its members have an interest in preserving the possibility of such activities in the future. As such, the Center and its members have an interest in helping to ensure the continued use and enjoyment of these lands.

Sierra Club is one of the oldest grassroots environmental organizations in the country with more than 2.4 million members and supporters nationwide and 35,000 in Arizona. Sierra Club's mission is "to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments." Sierra Club and its members have a strong interest in public lands, waters, and wildlife, and have long advocated for protection of the affected lands to prevent harm from uranium mining and exploration.

INTRODUCTION

We are adamantly opposed to the operation of these three uranium mines, all of which are located within watersheds (surface and ground) that drain directly into Grand Canyon National Park and all of which threaten water, air, and other important resources of the greater Grand Canyon ecoregion, including soil, wildlife, sacred Native American sites, and the health of the people who are exposed to the heavy metals and radiation associated with these mines.

For more than a half-century, uranium mining has permanently polluted our land, air, and water. Its deadly and toxic legacy is well documented and yet state and federal agencies are still permitting new mines to open.

Five years ago, our organizations, Coconino County Supervisor Carl Taylor, and hundreds of citizens objected to issuing air permits for these three mines because they impose unacceptable risks to residents and visitors to the Grand Canyon region. ADEQ has yet to address substantive issues that we raised five years ago. Additionally, we object to ADEQ timing the issuance of this permit during the holiday season, and failing to provide opportunity for public meetings near the affected areas.

ADEQ has a responsibility, pursuant to A.R.S. § 49- 104 relating to the powers and duties of the department and director, to ensure that it develops policies, plans, and programs "to protect the environment" [A.R.S. § 49-104(A)(1)] and also to "[p]romote and coordinate the protection and enhancement of the quality of water resources consistent with the environmental policy of this state" [A.R.S. § 49-104(A)(7)]. Furthermore, the statute requires that the agency prevent and abate water pollution [A.R.S. § 49-104(A)(10)]. ADEQ also has delegated authority relative to the federal Clean Air Act. Pursuant to A.R.S. § 49-401(A), "The legislature by this act intends to exercise the police power of this state in a coordinated state-wide program to control present and future sources of emission of air contaminants to the end that air polluting activities of every type shall be regulated in a manner that insures the health, safety and general welfare of all the citizens of the state; protects property values and protects plant and animal life." Subsection B states, "…the policy of this state that no further degradation of the air in the state of Arizona by any industrial polluters shall be tolerated." It is within this context that ADEQ should examine these permit applications and deny approval of all three of them. ADEQ cannot fulfill its

responsibility to protect the environment, the plants and animals, and the health of the people of Arizona if it takes action to permit these mines.

Changed Circumstances since ADEQ's Last Issuance of the Air Quality Permits

Uranium mining does not occur in a static environment. In the five years since ADEQ last issued these air quality permits, information has emerged demonstrating the extreme threat uranium mining poses to the Grand Canyon region. For example, studies in the Four Corners region, where most American uranium mines are located, indicate new information about harms from uranium mining that ADEQ should consider prior to the issuance of these permits.[1] Chief among the new studies is the 2011 Northern Arizona Withdrawal Final Environmental Impact Statement (EIS), which combined pre-existing information with extensive new surveys and analyses.[2] Among other things, the EIS and other studies have shown that: (1) radon gas, a uranium decay product, delivers almost twice the radiation dose to humans as previously thought, meaning that previous dose estimates for miners need to be doubled to accurately reflect lung cancer risk;[3] (2) "long term ingestion of uranium by humans may produce interference with kidney function at the elevated levels of uranium found in some groundwater supplies;"[4] (3) bone is a likely target of uranium toxicity in humans, and even low uranium concentrations in drinking water can cause toxic effects on the kidneys;[5] (4) chromosomal abnormalities in babies born within the vicinity of uranium mining operations;[6] (5) babies born from mothers who lived near a uranium tailings dump exhibited abnormally high rates of birth defects;[7] (6) a link between high rates of systemic lupus to living near a uranium processing facility;[8] (7) soil properties affect uranium mobility

---

[1] U.S. EPA, Radiation Protection: Uranium Mining Wastes, *available at* http://www.epa.gov/radiation/tenorm-uranium-mining-wastes.

[2] *See generally* 2012 Withdrawal FEIS at Chapters 3-4; *see, e.g.*, *id.* at 3-41 to 3-42, 3-99 (describing updated hydrological studies and soil surveys).

[3] R. Taubenfeld, et al., High Risk – Low Return: The Case Against Uranium Mining in Queensland, 12 (Mar. 2013), *available at* http://qnfa.files.wordpress.com/2013/03/180313highcost-lowreturn-uinqld.pdf.

[4] M. L. Zamora, et al, *Chronic Ingestion of Uranium in Drinking Water: A Study of Kidney Bioeffects in Humans*, 43 Toxicological Sciences, 68-77 (1998).

[5] P. Kurttio, et al., *Bone as a Possible Target of Chemical Toxicity of Natural Uranium in Drinking Water*, Environmental Health Perspectives, 72 (Jan. 2005), *available at* http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253712/; P. Kurttio, et al., *Renal Effects of Drinking Water in Uranium*, Environmental Health Perspectives, 337-42 (Apr. 2002), *available at* http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240795/pdf/ehp0110-000337.pdf.

[6] W. Au, et al., *Biomarker Monitoring of a Population Residing near Uranium Mining Activities*, 103 *Environmental Health Perspectives,* 466-70 (May 1995), *available at* http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1523284/pdf/envhper00354-0058.pdf.

[7] L. M. Shields, et al., *Navajo Birth Outcomes in the Shiprock Uranium Mining Area*, 63 *Health Physics* 542-51 (Nov. 1992), *available at* http://www.ncbi.nlm.nih.gov/pubmed/1399640.

[8] American College of Rheumatology, Uranium Exposure Linked to High Lupus Rates in Community Living Near a Former Refinery (Nov. 10, 2012), *ScienceDaily*, *available at* http://www.sciencedaily.com/releases/2012/11/121110155813.htm.

and uptake by plants and animals;[9] and (8) uranium decay products bioaccumulate.[10] Reflecting our better understanding of these and other adverse effects, the Environmental Protection Agency (EPA) in 2000 set new (and more stringent) drinking water standards for uranium.[11]

Finally, we have seen that uranium mines are often harder and costlier to clean up than anyone expected. A 2012 report issued by the U.S. Government Accountability Office (GAO) found that the Bureau of Land Management (BLM) and the Forest Service "do not have reliable data on the number and location of abandoned uranium mine sites on federal land or a definitive cost for their cleanup."[12] The GAO separately identified a $60.6 million gap between the amount BLM estimated for financial assurance requirements and the actual value of financial assurances in place at abandoned hardrock mines.[13] A recent survey in New Mexico identified 259 abandoned mines, 139 of which had no record of reclamation.[14] A 1999 Energy Information Agency report indicated that the Department of Energy (DOE) had spent $1.5 *billion* on remediation of uranium mill sites.[15] In August 2014, the DOE issued a report to Congress regarding defense-related abandoned uranium mines that identified their location, impacts, and remediation feasibility and cost.[16] This analysis pointed to a need for long-term remediation of health and environmental risks that could cost taxpayers over $15 million per affected site.

Canyon Mine, PERMIT 62877

Due to the Canyon Mine being the most likely mine to operate during the duration of this permit process, the commenting parties have dedicated more time to explaining the need for ADEQ to be particularly vigilant in protecting the Grand Canyon region from harms caused by this mine.

The Canyon Mine is in the Kaibab National Forest, about six miles south of the Grand Canyon National Park boundary. Uranium at the mine is found between 900 and 1400 feet deep, in a

---

[9] Canadian Council of Ministers of the Environment, Canadian Soil Quality Guidelines for Uranium: Environmental and Human Health, 22-23, 25, 28 (2007), *available at* http://www.ccme.ca/files/Resources/supporting_scientific_documents/uranium_ssd_soil_1.2.pdf.

[10] National Research Council, *Uranium Mining in Virginia*, at 210 (citing C.I.E. Wiramanaden, et al., *Selenium distribution in a lake system receiving effluent from a metal mining and milling operation in Northern Saskatchewan, Canada*, 29 ENVTL TOXICOLOGY & CHEMISTRY 488, 606-616 (2010), *available at* http://onlinelibrary.wiley.com/doi/10.1002/etc.63/pdf).

[11] U.S. EPA, Basic Information about Radionuclides in Drinking Water, *available at* http://water.epa.gov/drink/contaminants/basicinformation/radionuclides.cfm.

[12] GAO-12-544 at 30.

[13] *Information on Abandoned Mines and Value and Coverage of Financial Assurances on BLM Land: Oversight Hearings on Hardrock Mining Before the S. Comm. on Energy and Natural Resources,* 110th Cong. 29 (2008) (statement of Robin M. Nazzaro, Director, Natural Resources and Environment, GAO).

[14] New Mexico Senate Joint Memorial 15, Urging Congress to Appropriate Funds for the Cleanup of Abandoned Uranium Mines Opened and Operated for the Benefit of the Federal Government (Mar. 17, 2009), *available at* http://www.nmlegis.gov/Sessions/09%20Regular/final/SJM015.pdf.

[15] U.S. EIA, *Remediation of UMTRCA Title I Uranium Mill Sites under the UMTRCA Project Summary Table: Uranium Ore Processed, Disposal Cell Material, and Cost for Remediation as of December 31, 1999* (1999), *available at* http://www.eia.gov/nuclear/umtra/.

[16] *See* U.S. DOE, Office of Legacy Management, Abandoned Uranium Mines Report to Congress (2014), *available at* http://www.lm.doe.gov/aum/.

"breccia" formation, a cylindrical pipe that extends deep into the earth. In 1986, the Forest Service prepared an EIS and approved a plan of operations that allowed 17 acres of surface disturbance and onsite stockpiling of waste rock (in perpetuity), and required $100,000 in reclamation and mitigation and monitoring plans. However, when the price of uranium dropped in the early 1990s, the operator ceased operations at Canyon Mine without informing the Forest Service. The mineshaft had not been dug at the time of the closure. In 1997, a new operator acquired the mine and told the Forest Service that the mine was on "standby status."

Many things changed in the years after the Forest Service approved the plan of operations, during the "standby" period. In 1989, the EPA promulgated new Clean Air Act regulations to regulate certain underground uranium mining operations.[17] Among other things, the regulations require operators to comply with specific standards for radon emissions and obtain a permit from EPA.[18] In 1996, the U.S. Fish & Wildlife Service reintroduced the endangered California condor to northern Arizona. The condor is attracted to mining structures and water pits that are typically part of mining operations such as the Canyon Mine. Condors are known to visit the Canyon Mine and its surrounding area, and that site is within a newly-designated condor management area.[19]

In 2005, the United States Geological Survey (USGS) completed a study of the Redwall-Muav Aquifer ("R-Aquifer") underlying the Coconino Plateau, where the Canyon Mine is located.[20] Before the study, little was known about the regional groundwater flow systems of the study area. The study demonstrated that the R-aquifer is recharged by faults, fissures, fractures and other geologic formations in the subsurface, including via perched smaller aquifers that lie above the R-aquifer.[21] The study also showed elevated levels of uranium contamination—radioactive constituents and alpha particles—in creeks, seeps, and springs near former mine sites.[22] In 2008, the Forest Service reviewed water resources on the Coconino Plateau, including groundwater.[23] The Forest Service determined that fractured bedrock provides conduits for downward movement of water and groundwater recharge.[24] The agency's review also determined that local

---

[17] EPA, National Emission Standards for Hazardous Air Pollutants; Radionuclides, 54 Fed. Reg. 51, 654 (Dec. 15, 1989), as amended, 65 Fed. Reg. 62, 151 (Oct. 17, 2000) (codified at 40 C.F.R. Part 61).
[18] *See generally* 40 C.F.R. § 61, Subpts. A-B.
[19] Letter, Steven L. Spangle, Field Supervisor, Arizona Ecological Services Office, U.S. Fish & Wildlife Service, to Michael R. Williams, Forest Supervisor, Kaibab National Forest, 2-3 (Feb. 9, 2012); *Center for Biological Diversity v. Salazar*, No. 3:09-cv-08207-DGC, Docket No. 38, Ex. 24 at 1.
[20] USGS, *Scientific Investigations Report 2005-5222: Hydrogeology of the Coconino Plateau and Adjacent Areas, Coconino and Yavapai Counties, Arizona* (2005), *available at* http://pubs.usgs.gov/sir/2005/5222/sir2005-5222_text.pdf.
[21] *Id.* at 42-43.
[22] *Id.* at 51-52.
[23] U.S. Forest Service, Southwestern Region, Kaibab National Forest, Canyon Uranium Mine Review: Review of the Canyon Mine Plan of Operations and Associated Documentation in Anticipation of Resumption of Operations, 31 (June 25, 2012), *available at* https://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5376042.pdf (hereinafter "Canyon Uranium Mine Review").
[24] U.S. Forest Service Kaibab National Forest: Ecological Sustainability Report, 52 (Dec. 19, 2008), *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm91_050014.pdf.

communities depend more on groundwater as their water sources than they did in the 1980s.[25] Finally, in 2010, the USGS published a study we mentioned briefly above,[26] in which the USGS reported that uranium and arsenic were consistently detected above background levels in the areas disturbed by uranium mining in northern Arizona. Samples from 15 springs and five wells in the region contained dissolved uranium concentrations greater than EPA's maximum allowed contaminants for drinking water.[27] Of particular note, there were elevated uranium concentrations within the Canyon Mine monitoring and water well.[28]

Also in 2010, the Forest Service determined that Red Butte, a mountain four miles south of the Canyon Mine, and the surrounding area warranted designation as a Traditional Cultural Property.[29] Red Butte is one of the most important sites in the religious and cultural tradition of the Havasupai Tribe, and it holds major religious significance for the Hopi, Navajo, Zuni and Hualapai Tribes.[30] The Havasupai refer to Red Butte as "the Landmark," and it plays a central part in their origin story.[31] In addition, the Havasupai consider the meadow where the Canyon Mine is located to be sacred and spiritually tied to Red Butte.[32] Designation of Red Butte as a Traditional Cultural Property made it eligible for listing on the National Register of Historic Places.[33]

Meanwhile, between 2008 and 2012, Congress and the Department of the Interior were evaluating whether to withdraw the lands surrounding Grand Canyon National Park from mining and other uses. In 2009 the Department of the Interior issued a proposed withdrawal of one million acres, including the land where the Canyon Mine is located, to "ensure we are developing our nation's resources in a way that protects local communities, treasured landscapes, and our watersheds[.]"[34] In October 2011, BLM issued the Final EIS for the 2012 Withdrawal, and, on January 9, 2012, the Secretary of the Interior issued the 2012 Withdrawal.[35] While the Secretary reasoned that further investigation of the impacts of uranium mining on water and other resources was necessary, those impacts could be "significant." In addition, in April 2012,

---

[25] *Id*.
[26] *See* U.S. Department of the Interior & USGS, *Scientific Investigations Report No. 2010-5025: Hydrological, Geological, and Biological Site Characterization of Breccia Pipe Uranium Deposits in Northern Arizona* (2010)), *available at* http://pubs.usgs.gov/sir/2010/5025/pdf/sir2010-5025.pdf.
[27] *See generally id.* at 43-338.
[28] *Id*. at 118.
[29] U.S. Forest Service, Canyon Uranium Mine Review at 9-10.
[30] *Id*. at 10-15, 23.
[31] Stephen Hirst, *I Am the Grand Canyon: The Story of the Havasupai People*, 84 (2006); Christina Aanestad, "Havasupai Rally to Stop Uranium Mining at Grand Canyon, AZ," *Indy Bay*, 1 (Tues., Aug. 4, 2009), *available at* http://www.biologicaldiversity.org/news/media-archive/UraniumMining_IndyBay_8-4-09.pdf.
[32] U.S. Forest Service, Canyon Uranium Mine Review at 13-14.
[33] *Id*. at 9-10, 15.
[34] BLM, Notice of Proposed Withdrawal and Opportunity for Public Meeting; Arizona, 74 Fed. Reg. 35, 887 (July 21, 2009); BLM, News Release, "Salazar Calls Two-Year 'Time-Out' from New Mining Claims on Arizona Strip Watershed near Grand Canyon National Park," (July 20, 2009), *available at* http://www.blm.gov/wo/st/en/info/newsroom/2009/july/NR_0720_2009.html (quoting Secretary of the Interior Kenneth Salazar).
[35] *See generally* 2012 Withdrawal ROD.

the Forest Service issued a draft revised Forest Plan for the Kaibab National Forest, which contained various new guidelines to protect tribal resources, including Red Butte.[36]

Despite all this new information and change, in June 2012 the Forest Service allowed operations to resume at the Canyon Mine. This action was based on the plan of operations and EIS approved 26 years earlier, without detailed monitoring or inspections in the meantime. As part of the 2012 action, the Forest Service prepared a "Mine Review," as well as an assessment of the operators' "valid existing right" and a review under the Endangered Species Act. The Forest Service did not: allow the public to comment during the review process; adopt the conservation measures proposed by the U.S. Fish & Wildlife Service to protect the California condor; prepare a supplemental National Environmental Policy Act (NEPA) review; or *amend the 1986 plan of operations in any way*. The Forest Service also did not prepare an updated historical and cultural review under the National Historic Preservation Act, despite the designation of Red Butte as a Traditional Cultural Property and despite objections from the Advisory Council on Historic Preservation and the Arizona State Historic Preservation Officer. The result was that the mining operator could resume operations based on decades-old reviews and approvals.

Given the federal government's refusal to properly regulate the Canyon Mine, it is incumbent on ADEQ to protect the Grand Canyon region by requiring the most rigorous air quality standards within its discretion and consistent with the federal Clean Air Act. We are all aware of the disaster still unfolding on the Navajo Nation due to inadequate regulation and irresponsible industry operation. The Grand Canyon State can ill afford to see its lands, waters, and economic driver – Grand Canyon – contaminated with uranium. We urge ADEQ to implement the changes to the permitting process suggested in the comments below.

Air Quality Permits for EZ Mine, PERMIT 62878 and Pinenut Mine, PERMIT 62876

Energy Fuels proposes to operate the EZ Mine located approximately 36 miles south of Fredonia, Arizona. The EZ mine will produce approximately 146,500 tons of ore per year. Under the pending permit, it would be allowed to stockpile up to 169,400 tons of ore on the site, more than ten times the 13,100 tons of on-site uranium ore allowed at Canyon Mine.

However, ADEQ's stated location for the EZ mine is in error. The introduction to ADEQ's technical review of EZ Mine's air pollution permit states that it "…is for the operation of an underground uranium mine located on the Coconino Plateau in Coconino County, Arizona approximately 6.5 miles southeast of Tusayan.[37] It appears that ADEQ failed to change the location when it copied its review of Canyon Mine and pasted it into its review for the EZ Mine permit. Furthermore, ADEQ's introduction fails to change the EZ's projected ore production of 146,500 tons per year from the 109,500 tons of uranium ore to be produced from Canyon Mine.

---

[36] *See* U.S. Forest Service, Draft Land and Resource Management Plan for the Kaibab National Forest; Coconino, Yavapai, and Mojave Counties, Arizona (April 2012), *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5362231.pdf. The Forest Service issued a final revised plan in February 2014.

[37] *See* Technical Review and Evaluation of Application for Air Quality Permit No. 62878 , *available at* http://azdeq.gov/calendar/tsd_ez_mine.pdf.

Such errors suggest that ADEQ's review of these mines is simply a rubber-stamp process that uses boilerplate language for approval.

Energy Fuels plans to open the proposed EZ Mine and produce approximately 146,500 tons of ore per year. The EZ Mine has not undergone federal review under NEPA, the Endangered Species Act, or the National Historic Preservation Act. It does not currently have a plan of operations. There is no guarantee that this mine will ever open. If it does open, the ore will be stockpiled when it cannot be hauled to the processing mill in Blanding, Utah. We encourage ADEQ to wait to issue an air quality permit until it has a chance to review Energy Fuels' plan of operations, mining protocol, and proposed location of radon vents as will be described in an official Plan of Operations. This would also allow ADEQ to benefit from the full NEPA review undertaken as part of the EIS process. We also encourage ADEQ to note in the permit that the EZ mine will be a new uranium mine – not a reactivated mine as currently stated.

Energy Fuels has almost finished extraction at the Pinenut Mine, which has a production rate of 109,500 tons per year of uranium ore. The company has been shipping ore to the White Mesa Mill, and has been stockpiling the ore on-site when it cannot be shipped. The Ore Stockpile Area is able to accommodate up to 67,230 tons of ore. The commenting parties expect that this will be the final air quality permit issued for the Pinenut Mine, as the facility should undergo reclamation within the next five years.

ADEQ Must Take Utmost Caution in Permitting Mines Because They are in Grand Canyon National Park's Class I Attainment Area under the Federal Clean Air Act

Grand Canyon National Park is a Class I Attainment Area. Section R18-217(B)(4) of the Arizona Administrative Code implements Title I Part C of the Federal Clean Air Act (CAA). R18-217(B)(4) says all national parks that exceed 6,000 acres in size and were designated as a national park before 1977 shall be classified as Class I Attainment areas. Grand Canyon National Park is more than one million acres in size and was designated as a national park in 1919; therefore, it is a Class I Attainment Area. The primary function of that part of the CAA is to "preserve, protect, and enhance the air quality of national parks…and other areas of special national or regional natural, recreational, scenic, or historic value." In order to achieve that purpose, the CAA also states that all decisions to increase air pollution in any area where Title I Part C applies will be made only after "careful evaluation of all the consequences of such a decision…"

Pinenut Mine and Canyon Mine are less than eight miles and EZ Mine is 14.9 miles from Grand Canyon National Park. All three are located within highly used recreation areas. Therefore, ADEQ should accord heightened care to the decision of whether to permit these facilities. Indeed, the fact that the air emissions for these facilities are below major source thresholds is obviated by the fact that each uranium mine is located in Grand Canyon National Park's Class 1 Attainment Area.[38]

While modeling was conducted for each of these mines and, according to ADEQ, "…will not

[38] *See* Arizona Administrative Code (A.A.C.) R18-2-302.B.2.a.ii.

adversely impact visibility in Grand Canyon National Park," we have significant concerns with this analysis, including that the modeling does not adequately address fugitive dust issues.

The proposed permits demonstrate cursory attention by ADEQ to its duty to preserve and enhance the air quality of national parks, because they are based on dated (1986 for both Pinenut and Canyon) or, in the case of EZ Mine, no approved Mining Plan of Operation. Given ADEQ's duty to carefully evaluate all the consequences of the decision to open the mine, it follows that ADEQ should conduct new studies that take into consideration any changes that have occurred at the site over the past 20 years. For example, drought-induced plant mortality, off-road vehicle use, and invasion of the area by local bison-hybrid herds increase dust mobility. People are recreating on public lands in increased numbers, and cumulative dust impacts, as well as risks to visitors from dust originating at southwestern uranium mines, must be considered.[39]

The proposed permits also offer little assurance that they will successfully implement control measures designed to limit major emissions. For example, each of the proposed permits relies on standby generators being limited to 120 hours of operation per year without any indication as to how those limitations will be enforced. The failure by ADEQ to carefully evaluate the consequences of opening these mines demonstrates a breach of its federally required duties imposed by the CAA.

Energy Fuels has dozens of citations for violations in the mines it operates in the United States, including in the Grand Canyon region. According to the U.S. Department of Labor Mine Safety and Health Administration, Energy Fuels mines have several violations for the Pinenut Mine over the last six years. Energy Fuels failed to notify the agency that they were commencing operations (30CFR§56.1000), failed to prepare and submit a form on quarterly employment (30CFR§50.30), failed to provide safety device provisions and procedures for roadways, railroads, and loading and dumping sites (30CFR§57.9300), and improperly stored combustible materials (30CFR§57.4130), among many other issues.[40]

Energy Fuels has also received numerous safety citations at its White Mesa Mill in Utah and at the Arizona I Mine in Arizona. The company has repeatedly violated EPA reporting requirements, and failed to comply with emissions standards at the mines it now operates in Arizona and Utah. The Pandora and Beaver Shaft mines in La Sal, Utah exceeded allowable levels of release for the toxic gas radon, which is regulated by EPA, and did not test all of its vents for emissions.[41] After that, the company was required to begin submitting monthly reports, but failed to submit them for several months in 2010. In May 2010, EPA issued a notice of violation to Energy Fuels for failing to properly monitor radon emissions at its Arizona I

---

[39] Beisner, K.R., T.M. Marston, and D.L. Naftz. 2010. Assessment of nonpoint source chemical loading potential to watersheds containing uranium waste dumps and human health hazards associated with uranium exploration and mining, Red, White, and Fry Canyons, Southeastern Utah, 2007. USGS and BLM SIR 2010-5108.

[40] *See* Mine Safety and Health Administration (MSHA) Mine Citations, Orders, and Safeguards, Energy Fuels, accessed online 12/15/2015.

[41] Fields, Sarah. "Irresponsible industry…" The Moab Times-Independent, *available at* http://www.moabtimes.com/view/full_story/9817599/article-Irresponsibleindustry%E2%80%A6.

location.[42] Conservation groups and tribes are suing the BLM in federal court for allowing Energy Fuels to open the Canyon Mine without updating 1980s-era mining plans and environmental reviews. Energy Fuels has also had safety violations at that mine.[43]

These citations demonstrate that the company is in need of closer scrutiny and attention and should be required to do additional site characterization, monitoring, and sampling.

ADEQ Must Protect the Public and Environment by Requiring Fine Particulate Monitoring (PM 2.5) and Mitigation

In order to regulate air emissions in a way that ensures the health, safety, and general welfare of citizens, and in a way that protects animal and plant life, ADEQ must monitor and impose measures to prevent dispersion of fine particulate matter known to cause severe health effects. Ore and waste rock piles at uranium mines in northern Arizona can be sources for airborne fine particulate matter. For example, the USGS just completed a fairly detailed site assessment of surface contamination at mines on the Arizona Strip.[44] At the Kanab North Mine near Kanab Creek, it found an extensive downwind uranium delta believed to be the result of wind-dispersed fine particulate uranium dust:

> "Kanab North Mine: Mined waste rock, uranium ore, pond sludge, and local wind- and water dispersed fine particles on the unreclaimed mine site (all of which contained high concentrations of uranium and other trace element constituents such as arsenic) were exposed to the ambient environment for about 20 years at the Kanab North partially mined site. Offsite, only one soil sample approximated background uranium concentrations, suggesting that dispersion extends beyond the limit of sampling, about 420 feet. Soil samples (n=20) collected within about 420 feet outside of the fenced mine site had an average uranium concentration of 27.8 parts per million (more than 10 times background concentration) and arsenic concentration of 12 parts per million. Wind appears to be the dominant process dispersing material offsite" (page 49).

Tailings piles, truck loading areas, and roadways should be monitored for fine dust particles smaller than 2.5 microns. Currently, only particles smaller than 10 microns are being monitored. Without monitoring fine particulate matter, and without imposing measures that prevent fine particulate dispersion from uranium mining facilitates, ADEQ cannot insure that air polluting activities of uranium mines are being "regulated in a manner that insures the health, safety and general welfare of all the citizens of the state; protects property values and protects plant and animal life."[45] Fine particulate matter is difficult to contain, readily inhaled, readily suspended

---

[42] U.S. EPA. Denison Mines Corp Arizona 1 Mine Finding and Notice of Violation, *available at* http://www.grandcanyontrust.org/sites/default/files/e_uranium_denison_violation_5_3_10.pdf.
[43] *See* Mine Safety and Health Administration (MSHA) Mine Citations, Orders, and Safeguards, Energy Fuels, accessed online 12/15/2015.
[44] Otton, J.K., T.J. Gallegos, B.S. Van Gosen, R. H. Johnson, R.A. Zielinski, S.M. Hall, R. Arnold, and D.B. Yager. 2010. Effects of 1980s uranium mining in the Kanab Creek area of Northern Arizona. USGS SIR 2010-5025.
[45] *See* Mine Safety and Health Administration (MSHA) Mine Citations, Orders, and Safeguards, Energy Fuels, accessed online 12/15/2015.

and transported by wind, and can contain many heavy metals as well as uranium. Dust associated with uranium mining has been found to carry arsenic, lead, copper, cadmium, nickel, strontium, and cobalt, as well as uranium. Fine particulate matter is of concern because it is small enough to enter the blood stream when inhaled and has been linked to cancer, neurotoxicity, immunotoxicity, cardiotoxicity, and increased morbidity/mortality. Fine particulate uranium dust is of particular concern because if inhaled and absorbed into the blood stream, sensitive living tissue can be exposed to alpha radiation. The resulting biological damage increases the risk of cancer; in particular, alpha radiation is known to cause lung cancer in humans when alpha emitters are inhaled.[46]

ADEQ cannot rely on Energy Fuel's use of AERMOD to model dust dispersion because AERMOD is designed to model plume dispersion, not fugitive dust dispersion. AERMOD is "a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain."[47] Gaseous plumes behave very differently than airborne fugitive dust, and plume modeling does not accurately depict the dispersion of different fugitive dust particle sizes across different wind speed thresholds. In order to be useful in the context of proposed uranium mining, fugitive dust modeling must be capable of estimating wind speed thresholds for dust mobilization, suspension, transport and deposition across a range of dust particle sizes (including fine particulates). For starters, we recommend using HYSPLIT trajectories or Windrose diagrams to determine wind velocity from which transport determinations based on particle size and threshold wind velocities can then be derived.

Prior to issuing any permits, ADEQ should conduct its own modeling for PM 10 and 2.5 rather than relying on Energy Fuel's modeling. ADEQ should subject its modeling assumptions and results to independent science peer review and it should make that modeling, its results, and peer review thereof available for public review on the ADEQ website prior to permit issuance. Prior to issuing any permits, ADEQ must develop and require a fine particulate monitoring system whose spatiotemporal extents, frequencies, exceedance triggers and mitigation measures are sufficient to insure against mine-related dust dispersion under the range of high-wind events that can occur at mining sites. We strongly encourage ADEQ to confer with independent scientists (non-agency, non-industry) with experience in uranium dust and alpha emitter effects to develop an adequate monitoring system for fine particulates.

Because Energy Fuels has a clear financial conflict of interest erring against costs associated with sufficiently extensive, frequent, and transparent monitoring, ADEQ should conduct monitoring itself. Monitoring systems must include a system whereby air quality exceedances, if and when detected, trigger additional dust mitigation measures. Those triggers and measures should be vetted publically and with independent (non-agency, non-industry) scientists prior to permit issuance. ADEQ should further require that bonding, dust mitigation plans, and all resources necessary to implement those plans be in place prior to issuing permits. The scope of

---

[46] *See*, for example: http://www.epa.gov/radiation/understand/alpha.html.

[47] U.S. EPA, Technology Transfer Network Support Center for Regulatory Atmospheric Modeling, Preferred/Recommended Model, *available at* http://www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod.

bonding and mitigation plans should include clean-up of off-site pollution in addition to the prevention of initial dust suspension on-site. The monitoring plan should include a measurable, quantitative trigger for mine shutdown if mitigation fails to curtail exceedances. In its permits, ADEQ should commit to making all monitoring results, including exceedances, publically available on its website in real time or near real time, to allow for public oversight and warning in the event of hazardous conditions.

ADEQ Must Monitor and Regulate Transportation-related Dust

The 2010 USGS report also found contamination around the closed and reclaimed Pigeon and Hermit mines, north of the Grand Canyon, and found elevated levels of uranium in soils near roads that likely originated from ore trucks. The Pigeon Mine operated from 1984-1989 and the Hermit Mine operated for less than a year in 1989. Similarly, testing near the 1979 Church Rock, New Mexico mining disaster, revealed elevated uranium in soils near haul roads.[48] Roads where trucks traveled 20 years ago still have uranium dust contamination along them. The mining is supposedly safer now, yet the operating procedures are the same as those from 20 years ago. The hazards of uranium exposure are most serious when the dust is ingested or inhaled, or when it is consumed in water. Trucks will pass through many communities, and should not leave the mine site without being completely sealed. Trucks should be required to contain dust more securely than with tarps. Energy Fuels stated that more secure trucks would be "extremely expensive." What would it cost to clean up a mess or compensate an exposed population? This ore should be treated like contaminated soils from a Superfund site, or at least, covered with a solid lid that has extra protection along seams. Analysis of expense associated with mitigation measures should include comparison of costs to public health and environmental services, clean-up and ongoing monitoring and mitigation of radioactive contamination of lands, waters and human population centers.

The Canyon Mine EIS from 1986 indicates that there will be 10 trucks per day leaving the mine[49], which means there will be 20 truck trips with empty trucks returning. There will be numerous truck trips traveling from the mine on 4.7 miles of unpaved Forest Service Road to US 180, then south 44.3 miles on US 180/SR 64 to Williams, then the trucks would head east on Interstate 40 for 37.5 miles to Flagstaff. The trucks will travel through Flagstaff and then north on US 89 for 62.3 miles, and through Navajo Nation lands.

From the EZ Mine, haul trucks will travel an unpaved road 7.3 miles to the Mount Trumbull Road, then 20.1 miles to a paved highway, State Route (SR) 389. Trucks would then travel 6.8 miles on SR 389 to US 89, then 74.8 miles through Fredonia, Arizona and Kanab, Utah to SR 98 near Page, Arizona. The trucks then travel 75.5 miles to US 160, then 26.4 miles to US 191 and north into Blanding, Utah.

There is a history of truck accidents related to previous uranium mining activities in the area.

---

[48] Statement of Chris Shuey before the Subcommittee on National Parks, Forests, and Public Lands, Natural Resources Committee, U.S. House of Representatives, March 28, 2008.

[49] Final Environmental Impact Statement Canyon Uranium Mine, August 1986. pp. iv, vii, 2.16, 4.19, 4.42, 4.43.

According to a May 14, 1986 article in *The Arizona Republic* about a uranium ore spill on the Navajo Nation, "[Tribal environmental specialist Levon] Benally said that when tribal officials arrived on the scene on the day after the accident, crews were removing the truck and spreading sand over the uranium ore to hide it. The company has had an agreement for the past several years with the tribe to transport uranium ore across the reservation."[50] The Church Rock Uranium Monitoring Project (CRUMP) Report for June 2003 to May 2007 conducted field investigations and data analysis in an area where past uranium mining was concentrated and found gamma radiation rates were significantly elevated over background along public highways and roads, on Navajo grazing lands, and in certain residential areas in close proximity to three abandoned uranium mines and a closed uranium mill and tailings disposal facility that is a federal Superfund site, even though mining and milling had ceased 20 years ago. This finding suggests that the residual effects of deposition of uranium ore from haul trucks operating at the site in the 1960s, 1970s and early 1980s can still be observed in the environment more than 20 years later.

> "Surveys conducted with hand-held instruments confirmed the presence of elevated gamma radiation along the highways and roads. The use of mechanized and hand-held detectors in tandem generated evidence of long-term radiological contamination of publicly accessible areas along highways and roads and next to occupied residences, especially those in the Red Water Pond Road area (Study Area A-1)."
>
> The principal source of the high gamma rates detected along State Route 566 in the vicinity of the Old Churchrock Mine was likely uranium ore hauled in trucks from the mine to the UNC mill from the mid-1970s through the early-1980s."[51]

The CRUMP study was conducted to address Navajo community concerns about possible long-term environmental impacts of past uranium mining and processing in residential areas and along major highways and roads in the Church Rock Mining District. The CRUMP investigation was a collaborative effort by community, local, state, federal and private entities. Considering that the trucks will be traveling through tribal lands, several communities and through places where emergency response may take some time, ADEQ and the Department of Transportation should require that the trucks provide something more than a tarp, considering the potential risk to these communities if an accident occurs.

Environmental Justice

The permits for these mines have serious environmental justice implications relative to Native American tribes including the Kaibab-Paiute, Havasupai, Hualapai, and Navajo Nation, among others. Issuing these permits will violate many of the tenets of Environmental Justice including: "demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias"; and "mandates the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for humans and other

---

[50] "Navajo officials concerned about spill of uranium ore" The Arizona Republic, 1986.
[51] Report of the Church Rock Uranium Monitoring Project, 2003-2007, p.37, *available at* http://www.sric.org/uranium/docs/CRUMPReportSummary.pdf.

living things."[52]

There is a legacy of contamination from uranium mining in the Southwest including 520 abandoned uranium mines throughout the Navajo Nation. The mines expose Navajo Nation residents to uranium through airborne dust and contaminated drinking water. The draft permits associated with the Canyon, EZ and Pinenut mines will impact the aboriginal land for several tribes including aboriginal land associated with the Canyon Mine site near Red Butte, as well as the land of the Navajo and Kaibab-Paiute as trucks pass through their reservations. ADEQ should require additional protections and should engage in additional analysis to evaluate the environmental justice implications of these mines and must ensure significant consultation with the affected tribes.

In light of these innumerable concerns and deficiencies, ADEQ should examine the air permit renewals and deny approval of all of three of them. ADEQ cannot fulfill its responsibility to protect the environment, the plants and animals, and the health of the people of Arizona if it continues to permit these mines to pollute the Grand Canyon region.

Thank you for your timely and careful consideration of our comments.

Sincerely,

Roger Clark
Grand Canyon Program Director, Grand Canyon Trust

Sandy Bahr
Chapter Director
Sierra Club, Grand Canyon Chapter

Katherine Davis
Public Lands Campaigner,Center for Biological Diversity

[52] First National People of Color Environmental Leadership Summit, Principles of Environmental Justice, *available at* http://www.ejnet.org/ej/principles.html