

BUREAU OF LAND MANAGEMENT
TUCSON FIELD OFFICE

ENVIRONMENTAL ASSESSMENT

NEPA #
DOI-BLM-AZ-G020-2013-0019-EA

ANDRADA MARBLE QUARRY
TUCSON FIELD OFFICE

April 22, 2013

PURPOSE & NEED

1.1 Introduction and Background

Note to Readers: The quarry proposal analyzed here was originally submitted by W.R. Henderson. W.R. Henderson undertook a corporate reorganization with the quarry now being operated by Andrada Holdings, PLC. The text of this environmental assessment reflects this change. Andrada Holdings will be referred to in the text as “Andrada”. This action was previously analyzed under Environmental Assessment Number DOI-BLM-AZ-G02005-0026-EA. The Environmental Assessment Number has been updated to DOI-BLM-AZ-G020-2013-0019-EA to conform with the requirements of BLM’s e-Planning system.

Mining Background

The Andrada Quarry is located approximately 25 miles southeast of Tucson, Arizona, at the north end of the Santa Rita Mountains (Map 1). The elevation within the quarry ranges from 3720 to 3900 feet. It is located one mile south of the intersection of Sahuarita and Wentworth Roads and is in a rural area that is undergoing rapid development with housing subdivisions.

The quarry has been in operation for more than 40 years and has produced a variety of high grade calcium carbonate products that have been utilized in the construction, paint, paper, and landscaping industries. The area is underlain by the Escabrosa Limestone which has been mined and exposed by numerous pits, drill holes, and exploration trenches including a deep pit dug by Georgia Marble Company. This pit intersects the water table on the private land portion of the property.

Process Background:

A mine plan of operations (MPO) for the proposed operation at Andrada Marble Quarry was submitted by Andrada in 2004. In accordance with provisions of the National Environmental Policy Act (NEPA) the impacts to the proposed operation were analyzed through an environmental assessment. On July 2005, the Tucson Field Office approved the PO. Following this approval, a request for a State Director Review of the environmental documentation was received in August 2005. A remand of the decision and subsequent stay was issued by the State Director in November 2005. The MPO and the environmental analysis was revised to better address the issues brought forth by the petitioners.

The Tucson Field Manager approved the revised MPO on March 12, 2007. This decision was then appealed to the Interior Board of Land Appeals (IBLA). Pursuant to the IBLA order (IBLA 2007-164) of July 31, 2007, the decision to approve the Mine Plan of Operations (MPO), dated March 12, 2007, for the Andrada Quarry was been set aside and remanded. The March 12, 2007 MPO approval relied on an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) that the Tucson Field Office (TFO) determined to warrant further environmental review.

1.2 Purpose and Need for the Proposed Action & Decision to be Made

The need for this action stems from the requirement that BLM respond to the plan of operation to mine submitted by Andrada under 43 CFR 3809.11 for locatable mineral operations greater than casual use.

The BLM must determine if the PO meets the requirements of 43 CFR 3809 and if so, must issue authorization for the implementation of the PO.

1.3 Conformance with BLM Land Use Plan(s)

The proposed action is subject to the Phoenix Resource Management Plan (RMP), approved September 1989. Page 14 of the RMP under the Minerals Management section describes how mineral development is generally encouraged on public lands to uphold the Bureau's multiple use mission. Locatable mineral mining activity within the planning area is administered on a case-by-case basis. Although the plan is silent on this specific action, there are no other decisions which preclude it. Therefore, this proposed action has been determined to conform to the land use plan terms and conditions as required by 43 CFR 1610.5.

1.4 Relationship to Statutes, Regulations, or Other Plans

The BLM decision only authorizes use of mineral estate held in reserve by the federal government and managed under the authority of the BLM. Use of non-BLM land (State Trust land and private land) is subject to the agency or private landowners' permission. Public lands in the area are subject to the current Threatened & Endangered Species guidelines and the applicable Land Health Standards Arizona Standards for Rangeland Health and Guidelines for Grazing Administration, approved April 28, 1997.

The proposed action is regulated under BLM's Surface Management Regulations at 43 CFR 3809 and 43 CFR 3715. The operator is required to have an Arizona Pollution Discharge Eliminations System (AZPDES) Stormwater General-Multisector Permit from the Arizona Department of

Environmental Quality (Attachment B of the plan of operations) and an Air Quality Permit from Pima County Department of Environmental Quality (Attachment A of the plan of operations).

Because the mine will occur partially on Arizona State Trust land, Andrada has applied for and acquired a land use permit from the Arizona State Land Department. Special Land Use Permit 23-114960-11 is for 100 acres within the State of Arizona Lease described as Special Use Permit No. 23-52457 and is located in the Northwest Quarter of the Northwest Quarter of Section 21, Township 17 South, Range 16 East, G&SR Meridian.

Because Arizona State Trust land will be crossed to access the mine, Andrada has acquired a right-of-way from the Arizona State Land Department. The Haul Road Right of Way, Lease No 18-116832, is located by metes and bounds through the West Half of Section 16, Township 17 South, Range 16 East, and by metes and bounds through the Northeast Quarter of the Northwest Quarter of the Northwest Quarter of Section 21, Township 17 South, Range 16 East, Gila & Salt River Meridian as identified on the Mount Fagan, Arizona, 7.5 Minute USGS Quadrangle Map (1996).

The Andrada Quarry does not comply with the Pima County Land Use Plan. The Pima County Comprehensive Land Use Plan – Planned Land Use – Eastern Pima County of 6/15/06 indicates that the land use proposed by the County is for low-to-medium urban development. The proposed operation is strictly industrial in nature and in conflict with the plan set forth by Pima County.

The proposed action occurs within an area designated as a Biological Core within Pima County's Conservation Land System. The Pima County plan calls for protection of lands within the system through low-intensity uses and acquisition by the County. The proposed action also falls within the proposed Santa Rita Mountain Park, a park being planned by Pima County to protect scenic values, provide low-impact recreational opportunities, and assure access to the Coronado National Forest lands. These plans do not allow for mining and, indeed, mining may be incompatible with these plans. However, Pima County does not have jurisdiction on the subject lands and their plans are superseded by federal mining law and laws authorizing use on Arizona State Trust surface.

Neither 43 CFR 3715 or 43 CFR 3809 require operations to conform to local planning or zoning decisions. In fact, Arizona law, A.R.S. 11-830 (2), does not allow a county to prevent, restrict or otherwise regulate the use or occupation of land or improvements for railroad, mining, metallurgical, grazing or general agricultural purposes if the tract concerned is five or more contiguous commercial acres. A caveat to this exception is for aggregate mining operations in an aggregate mining operations zoning district. A

review of Pima County planning documents did not reveal the presence of an aggregate mining operations zoning district and in technical terms, the operation as planned by Andrada does not involve the mining of aggregates.

It would not be against applicable state and federal statutes and regulations for BLM to require that operations such as the Andrada Quarry be denied on the basis of county planning and zoning requirements.

1.5 Scoping & Issues

1.5.1 External scoping: BLM sought public involvement from the community surrounding the Andrada Quarry. Two scoping meetings were held in the nearby community of Corona de Tucson. One meeting was hosted by the Santa Rita homeowners association and another by the Empire-Fagan Coalition, a local environmental group. The Santa Rita Homeowners meeting was attended by 20 people from the Corona de Tucson neighborhood and the Empire-Fagan meeting was attended by 35 people from the Copper Cut neighborhood which is adjacent to the Andrada Quarry. These meetings gave BLM an idea of the issues and concerns people have of the proposed action.

BLM mailed about 1800 post cards to the zip-code area in which the Andrada Quarry resides to inform people that the EA and unsigned FONSI were available for 30 day review. About 135 post cards came back as undeliverable because they were addressed to street addresses and not P.O. boxes. This amounts to over 93% of the post cards being delivered successfully.

BLM received 25 letters and e-mails from the public. All are against the quarry and do not want BLM to approve of the plan. Several letters lump the Andrada Quarry with several pending State Trust mining leases in the area and wanted the BLM and the State Land Department to deny them all.

1.5.3 Issues: From the external scoping meetings and submitted letters: the following Issues were identified:

- Blasting related effects including noise and potential damage to neighboring structures
- Water use at the quarry could affect neighboring wells

- Direct impacts to water quality in the pit
- Hours of operation could produce noise and light effects. Concern over potential night operations was raised
- Traffic and roadway impacts to Sahuarita and Wentworth Roads
- Dust impacts from quarry operations
- Impacts to endangered species
- Spread of noxious/exotic/invasive weeds and/or bullfrogs
- Socio-economic impacts including diminishment of property values on adjacent parcels.
- Solid and hazardous waste generation and disposal

2.0 Description of Alternatives, Including Proposed Action

2.1 Proposed Action: Andrada will mine high-purity calcium carbonate (marble) using open pit methods: drill and blast, excavate, crush, and stockpile for offsite removal to a processing plant. This constitutes the proposed action from beginning to end.

- 2.1.1 The final dimensions of the pit will be approximately 900 ft long, 700 ft wide and the final elevation of the pit floor will lower the top of a hill by 100 ft. The quarry will flatten a hill and not intersect the water table. Total disturbance on the claims will be 14 acres including the pit and staging areas. Crushing operations may occur on adjacent private lands.
- 2.1.2 Crushing operations on-site will crush mine run material to 3 inch minus in size. This material will be transported to Casa Grande, Arizona for final crushing and transportation via rail to market. Please refer to the plan of operations for the Andrada Quarry for a description of the proposed project. The estimated life of the project is 6 to 8 years and the project will involve 14.2 acres of federal mineral estate of which 6.7 acres will be new disturbance. The total area of the quarry including private and federal minerals would be approximately 37 acres.
- 2.1.3 Water will be used to control dust as will commercial dust suppressants as needed. Spray bars will be installed at several points on crushing equipment to limit dust generation.
- 2.1.4 Roads and process areas within the facility will be graded and bermed as needed. As potholes or washboarding appear in the road surface, it will be graded to reduce ground shock and surface vibrations and to protect equipment traveling on the roads. To control dust, appropriate speed limits will be

enforced in the mine area and clean water and dust suppressants will be applied to roadways, process areas and accessible working faces.

2.2 No Action Alternative: The Andrada Quarry would not be expanded onto lands underlain by federal mineral estate. Mining would continue on the private lands held by Andrada Holdings.

2.3 **Decision to be Made:** The BLM must determine if the MPO submitted by Andrada, with any mitigation measures required by BLM, meet the requirements of 43 CFR 3809.11. If the MPO meets regulatory requirements then the BLM must authorize Andrada to proceed under the MPO (with mitigating measures if warranted).

3.0 AFFECTED ENVIRONMENT

3.1 Resources Eliminated from Analysis

3.1.1 Areas of Critical Environmental Concern:

The proposed action is not within an ACEC according to "az_acec" vector digital data published by Arizona State Office, Engineering & Mapping Sciences Group, Jackson C. Johnson (10/28/1999). This element does not apply.

3.1.2 Threatened and Endangered Species:

Congress passed the Endangered Species Preservation Act in 1966. This law allowed listing of only native animal species as endangered and provided limited means for the protection of species so listed. The Departments of Interior, Agriculture, and Defense were to seek to protect listed species, and insofar as consistent with their primary purposes, preserve the habitats of such species. Land acquisition for protection of endangered species was also authorized. The Endangered Species Conservation Act of 1969 was passed to provide additional protection to species in danger of "worldwide extinction". Import of such species was prohibited, as was their subsequent sale within the U.S. This Act called for an international ministerial meeting to adopt a convention on the conservation of endangered species. The Endangered Species Act of 1973 served to consolidate and strengthen the provisions of its predecessors.

One of the principal provisions of the 1973 Act (Section 7) requires all Federal agencies to undertake programs for the conservation of endangered and threatened species, and prohibits from authorization, funding, or carrying out any action that would jeopardize a listed species or destroy or modify its "critical habitat".

A biological evaluation of the area was conducted by Phil Jenkins of Southern Arizona Botany (SAB). The survey was conducted by two people walking a grid pattern over the proposed quarry area in June 2004. Mr. Jenkins reported that no remarkable grasses or herbaceous plants were observed, and noted only the presence of typical, common species. The site is within the range of suitable habitat for two protected cacti, the Needle-spined Pineapple Cactus and the Pima Pineapple Cactus. Neither species was found on site.

In a Federal Register Notice dated December 14, 2010, the U.S. Fish and Wildlife Service designated the Sonoran population of the Desert Tortoise, *Gopherus agassizii*, as a candidate species under the Endangered Species Act. The area surrounding the Andrada quarry contains suitable habitat for the tortoise and a tortoise was found within a mile of the quarry. The tortoise will be carried through for analysis though it is not yet a listed species.

3.1.3 Cultural Resources:

Cultural resources are protected under several Federal laws. These laws were enacted to ensure consideration of historic values and to protect significant resources from destruction or theft. The major laws include: the National Historic Preservation Act (NHPA), Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), and the American Indian Religious Freedom Act of 1978 (AIRFA).

A cultural resources inventory consisting of a Class I (records search and literature review) and a Class III (100% coverage, pedestrian, non-collection) survey was completed by the staff of Cultural & Environmental Systems, Inc. (C&ES) between April 30 and May 10, 2004. According to their report, C&ES found no evidence of cultural resources in the proposed project area.

3.1.4 Native American Religious Concerns:

Past, present, and reasonably foreseeable activities in the region may result in an impact to resources of importance to Native Americans. The need to consider these potential impacts is addressed in the Archaeological Resources Protection Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, the Native American Graves Protection and Repatriation Act, and Executive Order 13007.

A cultural resources inventory consisting of a Class I (records search and literature review) and a Class III (100% coverage, pedestrian,

non-collection) survey was completed by the staff of Cultural & Environmental Systems, Inc. (C&ES) between April 30 and May 10, 2004. According to their report, C&ES found no Native American religious concerns in the proposed project area.

3.1.5 Wild and Scenic Rivers:

Congress passed the Wild and Scenic Rivers Act to preserve selected rivers from dams and developments associated with many of the nation's waterways. The Act provides a number of important measures to protect and enhance the values of rivers that are added to the National Wild and Scenic Rivers System. Section 7 of the Act directs federal agencies to protect the free-flowing condition and other values of designated rivers and congressionally authorized study rivers. Implementation of Section 7 requires development of rigorous and consistent interagency evaluation procedures to protect river resources. Through the language of this section, Congress expressed the clear intent to protect river values from the harmful effects of water resources projects.

In Arizona, the Salt River and the San Francisco River are congressionally authorized study rivers. In 1982, the recommendation was made to Congress not to designate them as Wild and Scenic Rivers. The Verde River is a designated Wild and Scenic River, and is the only one in Arizona. No part of the project impacts a Wild and Scenic River, a congressionally authorized study river, or water resources below, above or on a stream tributary to a designated river or congressionally authorized study river.

3.1.6 National Energy Policy:

The National Energy Policy requires an evaluation of access limitations to Federal lands in order to increase renewable energy production from sources such as biomass, wind, geothermal, and solar. In addition to renewable energy, the policy requires an examination of land status and lease stipulations to eliminate impediments to Federal oil and gas leasing. The Proposed Action is not an energy exploration or development project and has no impact on potential oil and gas exploration and development, as the area is generally unsuitable for those actions. This policy does not apply to this project.

3.1.7 Wetlands/Riparian Zones:

Wetlands are protected under the Clean Water Act and different criteria are used by agencies to classify wetlands to reflect variation in statutory protection and management objectives. The US Army Corps of Engineers (USACE) has primary authority under Section 404 of the Clean Water Act for protection of "jurisdictional" wetlands - those that

meet strict regulatory criteria for soil type, water dependent plant species, and period of saturated soils or inundation.

The U.S. Fish and Wildlife Service (FWS) uses a broader definition of wetlands than the USACE for mapping wetlands. Riparian zones are more likely to be included in the wetland classification used by the FWS. State-by-state mapping was performed in the 1980's for the National Wetlands Inventory (NWI) project using aerial photographs shot in the summer from 1980 through 1986 and limited field verification. Five major categories of wetlands were identified:

- Wetlands less than 10 acres - a range of small and diverse wetlands such as vegetated springs and seeps, seasonally flooded vegetated wetlands, temporarily flooded unvegetated flats, and permanently flooded ponds. The size of individual wetlands could not be determined.
- Wetlands between 10 and 40 acres - the same types as the smaller size category of wetlands.
- Wetlands greater than 40 acres - classified based on vegetation or, if unvegetated, based on substrate. The total number of acres for these types was determined.
- Wetland/upland complexes - comprises several small wetlands too close to map individually.
- Linear wetlands (miles) - unvegetated, intermittent streambeds or woody or emergent wetlands in stream course or drainages.

No identified wetlands or riparian zones are within the proposed project and, as such, this element does not apply.

3.1.8 Prime Farmland:

The Farmland Policy Protection Act (FPPA) is intended to minimize Federal Programs (including technical or financial assistance) contribution to the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that - to the extent possible - Federal programs and funded activities are administered to be compatible with state, local government units, and private programs and policies to protect farmland.

For the purpose of the FPPA, farmland includes prime farmland (prime soil characteristics), unique farmland (high value specialty crops), and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land. The proposed project is not located on land

that is currently farmed or on land that could be farmed, and this element does not apply.

3.1.9 Environmental Justice:

EPA defines Environmental Justice (EJ) as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or a socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

According to 2010 U.S. Census Bureau data concerning household income and racial makeup of the community in the zip code area hosting the Andrada Quarry 2.8% of families had incomes below the national poverty guideline and racial minorities made up 12% of the community population.

Based on the above statistics, the Proposed Action does not unfairly or disproportionately affect minority or low income populations.

3.1.10 Wilderness:

Wilderness is designated by Congress on federal public lands - National Parks, Forests, and Wildlife Refuges, and Bureau of Land Management lands - and is the highest form of protection for federal lands. This element is not affected as there is no designated wilderness area on the property or on the access roads to the property.

3.1.11 Floodplain:

Pima County regulates all unincorporated areas lying within the 100-year floodplain, to evaluate and control the risk of possible flood damages. The 100-year floodplain is defined as the area adjoining a watercourse that would be covered by water during a flood event having a 1 out of 100 chance of occurring in any given year. The project is proposed at an elevation of 3740-3900 feet ASL, and well above a designated 100-year floodplain. This element is not affected.

3.2 General Setting: Description by Resource Element

3.2.1 Air Quality: Dust generated by vehicles traveling on roads, construction, agriculture, burning and wind events create a type of air pollution called particulate matter. Rules and regulations have been adopted to limit the amount of

particulate matter produced by certain types of activities. The portion of Pima County, Arizona that the project occurs in is an air quality attainment area with dust control requirements specifically designed to mitigate fugitive dust production at construction sites.

- 3.2.2 Wastes, Hazardous or Solid: Solid wastes, including hazardous wastes, are regulated by the Resource Conservation and Recovery Act (RCRA). Hazardous waste comes in many shapes and forms. RCRA tightly regulates all hazardous waste from "cradle to grave." RCRA also controls garbage and industrial waste. There will be no hazardous waste treatment, storage, or disposal on site.

There is a very clear legal distinction between hazardous materials, hazardous substances, and hazardous wastes. Common garbage is municipal waste, which consists mainly of paper, yard trimmings, glass, and other materials. Industrial waste is process waste that comes from a broad range of operations. Other regulated wastes include waste oil and tires.

- 3.2.3 Water Quality: Several State and Federal laws are designed to protect water quality. The Clean Water Act and the Arizona Environmental Quality Act are both affected by this project. Section 404 of the Clean Water Act prohibits any dredging or filling of jurisdictional waterways without a permit from the US Army Corps of Engineers.

The National Pollutant Discharge Elimination System (NPDES) stormwater program requires operators of construction activities disturbing more than 1 acre to implement stormwater discharge management practices, or best management practices (BMPs).

The Arizona Aquifer Protection Program requires a permit to discharge water other than rain water to the groundwater.

The climate is a semi-arid desert. As a result, very little rain reaches the area, but storms can bring enough rain to cause release from the property. Annual rainfall is 12 inches, with 60% to 70% of the annual total occurring in the months of July, August, and September. Summer monsoonal moisture typically causes short-duration high-intensity storms that, by their nature, produce considerable runoff because the ground cannot absorb the water as fast as it falls.

3.2.4 Invasive and Non Native Weeds: On February 3, 1999, Executive Order 13112 was signed, requiring Federal agencies whose actions may affect the status of invasive species to use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them; and not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species.

Invasive and non-native weeds found regionally in the vicinity of the Andrada Quarry include Lehman's Love Grass and Buffelgrass.

3.2.5 Noise: Crushing operations will produce noise and vibration during daylight hours. Blasting will be periodically required at the Andrada Quarry. Andrada has developed a blasting plan for quarry operations. The reader is encouraged to view Attachment H of the Andrada Quarry plan of operations to see this blasting plan.

A single residence lies within 1450 ft of the proposed quarry. This property was recently purchased by Andrada and is under their control. The nearest residence outside of the control of Andrada is 2900 ft from the proposed quarry. According to the plan, the maximum peak particle velocity allowed will be 1.92 inches per second which is below the safe blasting criterion for residential structures recommended by the U.S. Bureau of Mines.

Even when blast vibration levels are far below the legal limit, perceptible vibration can be experienced inside nearby residences. These effects can be generated by ground vibration and air blast acting separately or together, and can last from one to three seconds or more depending upon the distance from the blast, geologic influences and other factors. Despite the sometimes startling effects of a blast, up to a point, there is

no correlation between how a blast "feels" and it's potential for causing structural damage to a home.

The largest factor controlling structural damage is peak particle velocity. By containing the peak particle velocity to values below the safe blasting criterion, cultural stresses (e.g., doors slamming, kids jumping, people ascending or descending stairs) and natural stresses (e.g., sunlight, wind, rain, temperature and humidity fluctuations and changes in soil moisture) should place far greater stresses on a home than the blasting proposed in the plan of operations. Of course, any stresses imposed on a structure by blasting will be in addition to the cultural and natural stresses already present. In this sense, any stress on structures induced by blasting will be cumulative with any other stress that may already exist on the structure.

- 3.2.6 Socioeconomic Impacts: Property values and employment are affected by business and industry, such as the proposed mine, that locate in any area.
- 3.2.7 Visual Resources: The Andrada Quarry contains many features from past mining activity including a pit, waste piles, and structures. The topography screens some of the past disturbance but much of it is visible from certain stretches of Sahuarita Road, Wentworth Road and State Highway 83.

4.0 ENVIRONMENTAL EFFECTS

4.1 Air Quality

- 4.1.1 Proposed action: Use of the emission control techniques described in the plan will ensure that dust will not migrate to the nearest properties which are 0.5 miles away. The dust control measures will be based on Pima County standards and air will not exceed 20% opacity.
- 4.1.2 No Action Alternative: Quarrying operations will continue on Andrada Holding's private lands are will continue to be subject to Pima County Air Quality standards.
- 4.1.3 Mitigation: The operator will adhere to the requirements of the Pima County Air Quality Activity Permit.
- 4.1.4 Residual impacts: Under both the proposed action and the no action alternative, particulate emissions will continue below regulated standards.

4.2 Wastes, Hazardous or Solid

4.2.1 Proposed Action: Business administrative functions will generate approximately one cubic yard of municipal waste per week; consisting of office and lunchroom waste. This waste will be removed by an approved waste hauling company and transferred to an approved municipal landfill. Portable restrooms will be provided and properly serviced.

Mine run material is processed by simple crushing. No chemical processes are used in the mining or processing of the material, and no by-product is formed or accumulated. Off-specification material will be returned to the mine site as reclaim fill.

Small quantities of hazardous waste will be held on-site until such time as they may be disposed of properly. Hazardous waste that is expected to be generated is limited to approximately twenty pounds per year of cleaning and maintenance chemicals. This is about the same as an average household. Waste tires and waste oil will be taken off site by a vehicle/equipment service company and disposed of through approved methods.

Blasting will be conducted by a licensed contractor. No explosives material will be stored on site.

4.2.2 No Action Alternative: Solid and hazardous waste generation will remain unchanged from the current condition.

4.2.3 Mitigation: All pertinent regulations governing solid and hazardous waste handling and disposal shall be observed.

4.2.4 Residual impacts: None

4.3 Water Quality and Quantity

4.3.1 Proposed Action: On October 18, 2004, the Corps of Engineers recorded a decision of jurisdictional delineation, citing that the proposed area did not contain jurisdictional waterways. Therefore, a Section 404 permit is not needed for this operation.

Stormwater impacts will be minimal and will be controlled. Controls and BMPs are outlined in the Stormwater Pollution Prevention Plan. Please refer to that document for more detail. A twelve inch or greater berm surrounding the site in the shape of a shallow dish will be constructed. This berm will be sufficient to control a 500 year storm event. This berm will be taken down and used in the reclamation as topsoil.

No system that discharges to groundwater will be used on site. The abandoned pit exposes groundwater which could pose a potential contaminant pathway. This pit will be filled with inert materials to reclaim the mine as required by state law and regulation.

Dust control at the previous operation required one million gallons (3.1 acre-feet) of water per year. To help conserve water, organic suppressants such as lignin sulfonate, latex, soybean extract, or gel stabilization will be used to reduce water use for dust control. Water use will be reduced to approximately 300,000-350,000 gallons (0.9 acre-feet) per year. For comparison, the consumptive use of the proposed operations is similar to the amount of water required by a family of five people (Arizona Department of Water Resources).

The rock that is removed from the site does not require washing or leaching and therefore the processing does not require water. The only water that will be used on site is for dust control and domestic uses in the on site building. Water used for dust control will be minimized by dust control measures as outlined in the plan of operations and associated permits. Reclaimed water will be used wherever possible.

Data from the Arizona Department of Water Resources and from geologic maps of the area has been used to analyze the impacts of the plan to groundwater levels. Of the twenty wells registered in section 21, all are classified for domestic use except the Andrada well which is classified for industrial use.

The Andrada production well is situated in overturned beds of Paleozoic rocks of the Escabrosa and Martin Formations, the same formation that contains the ore body of high-grade calcium carbonate. The static water level in the Andrada production well was measured at 41 feet below ground surface (bgs). The static water level in a residential well located approximately ¼ mile from the Andrada production well was measured at 192 feet bgs. The static ground water level in the old Georgia Marble pit was measured at about 40 feet bgs. The groundwater gradient in the vicinity of the Andrada Quarry is approximately 0.025 feet/foot in a northerly direction. Reference: JPC Consulting, 2012.

The domestic wells in section 21 are drilled in granite or Bisbee Group sedimentary rocks, both tight formations with varying degrees of secondary porosity and permeability (fractures). Static well levels in these formations are typically 100 to 800 ft below ground surface. After accounting for elevation differences, the domestic well water levels vary considerably with some deeper than the Andrada production well and some at nearly the same elevation. Reference: Wahl, 2005.

In 2012 an aquifer test was conducted utilizing the Andrada production well and two observation points: a residential well and the existing quarry pit (JGP Consulting, 2012). The purpose of the test was to determine aquifer properties in the vicinity of the production well and to estimate aquifer drawdown in response to pumping of the production well. The production well was pumped at 15 gal/min for four hours. Drawdown at the production well was measured at 3.75 feet. Based on the drawdown and recovery tests, aquifer transmissivity in the vicinity of the production well was calculated to be on the order of 4300 gallon per day/ft. Water levels at the residential well and at the quarry pit were virtually unchanged throughout the pumping and recovery tests. The test results are consistent with transmissivity values expected for a fractured bedrock aquifer.

Residents have complained in the past that water usage at the quarry caused their wells to run dry. The fluctuation of wells reported by local residents occurred during a time of drought and increasing residential demands on the subject aquifer, Wahl 2005.

- 4.3.2 No Action Alternative: Water use would continue on Andrada Holdings' private lands.
- 4.3.3 Mitigation: The use of chemical dust suppressants will reduce water use relative to past quarry practices.
- 4.3.4 Residual impacts: None

4.4 Invasive and Non Native Weeds

- 4.4.1 Proposed Action: The project has the potential of infestation by noxious and invasive species through transport of plant material by humans and equipment and due to the prolonged exposure of disturbed soil. The proposed action will disturb previously undisturbed areas as well as disturb previously disturbed areas where natural reclamation has taken place.
- 4.4.2 No Action Alternative: Ongoing quarry operations have the potential of infestation by noxious and invasive species through transport of plant material by humans and equipment and due to the prolonged exposure of disturbed soil.
- 4.4.3 Mitigation: The segregation of onsite equipment (loaders/crushers) from offsite equipment (over-the-road haul trucks) can serve to minimize the spread of weed seed via mining operations. Concurrent reclamation of mined areas can aid the re-establishment of desirable native species. The reclamation plan calls for reseeding reclaimed areas using a BLM-approved seed mix. The re-establishment of native species will greatly reduce the ability of weed species to thrive in the reclaimed area.
- 4.4.4 Residual impacts: The spread of weeds is a difficult process to control in any ground disturbing activity, particularly when the offsite equipment is frequently brought onsite such is the case of over-the-road haul trucks. Some establishment of weeds is expected despite the use of best management practices.

4.5 Noise

- 4.5.1 Proposed Action: Crushing operations will produce noise during daylight hours. The noise will be greatly diminished by topography and the distance to the nearest homes.

Blasting will be conducted on site within legal limits of particle velocity and sound (decibel) levels for impulsive sound for the protection of nearby structures and workers. 30 CFR 56.630 states (a) When explosive materials or initiating systems are brought to the blast site, the blast site shall be attended; barricaded and posted with warning signs, such as "Danger", "Explosives", or "Keep Out"; or flagged against unauthorized entry. Given this requirement the blasting proposed must be conducted so that the blast area does not include any residences or properties not under the direct control of the operator.

A blasting schedule will be developed with willing neighbors living within ½ mile of the quarry and pre-blast surveys will be conducted to mitigate the impacts of blasting. According to the Arizona State Mine Inspector, the customary practice is to conduct pre-blast inspections ¼ mile from the blasting site.

Although the Andrada plan of operations does not provide for a frequency of blasting, the purpose of developing a blasting schedule with the neighbors will establish a preferred time of day to lessen residential impacts. Blasting will occur as needed to loosen a sufficient volume of bedrock to provide feed for the crusher and the plant in Casa Grande. The feed may last a week or several weeks. Any impacts from noise will therefore be intermittent and infrequent.

- 4.5.2 No Action Alternative: Quarry operations will continue on Andrada Holdings' private lands with accompanying noise associated with mining activities such as blasting, crushing, loading, and hauling of materials.
- 4.5.3 Mitigation: None
- 4.5.4 Residual impacts: None

4.6 Socioeconomic Impacts

- 4.6.1 Proposed Action: The proposed action will result in a slight increase in local employment opportunities Eight to twelve

individuals will be employed at the mine and earn between \$10.00 to \$25.00 per hour. During operations, Andrada will reclaim past mining disturbances such as scars and dumps of bright white rock that some people consider an eyesore and possibly increase the value of the private property (and adjacent properties) over the long term.

Impacts to property values may have already occurred. Past mining operations in the area, and the presence of both State and Federal lands would indicate to any likely buyer the possibility that mining in the area could occur. Knowledgeable buyers (acting without duress) of property in the area would factor this possibility into the price that they would willingly pay, or have already paid, for such property.

Generally, any discounts attributable to such factors as mining or industrial development are factored into the original selling price of the property, especially when such factors are clearly evident. However, a change from no mining or industrial activity to a state of active operation may increase any original discount. The factors most likely to have a negative impact on property values are visibility, air quality, safety, noise and traffic.

As stated in the section on visual impacts, the visual impact of this operation is expected to be slight during the operation phase. Once reclamation is complete, visual impacts will not impact property values to a greater degree than they may already be impacted.

Air quality values will decrease but only to permitted levels. Nearby residents may notice increased levels of dust in their homes during active mining but, overall, air quality should not be noticeably different from other similar urbanized areas that abut rural lands.

The effects of blasting, such as noise, shock vibration and flyrock, could impact home values and sudden blast noise could discourage potential buyers. Home values could be affected by the unwanted effects of blasting for the duration of

the mining operations but should disappear when these operations end.

Structural damage due to blasting could also impact home prices. Potential buyers who come to believe that the property has been or could be damaged by blasting operations could be expected to heavily discount the price they would pay for such property. By participating in the pre-blast surveys, and constantly monitoring their property, current residents could avert reductions in the value of their property, but the mere fact that such actions are necessary could stigmatize the property and reduce its value.

Several longtime residents in the area have complained about past operators sending flyrock into yards during blasting. Blasting at the Andrada quarry, or any operation approved by BLM must be operated in accord with all applicable federal and state health and safety regulations and cannot be allowed to result in these types of incidents. Apart from the effect on home prices there are serious concerns about health and safety.

Blasting techniques that produce flyrock that lands outside the blast site are counterproductive, uneconomic, and in violation of health, and safety regulations. Andrada will take care to only loosen the ore and thus reduce the incidence of flyrock within the blast site and prevent the incidence of flyrock landing outside the blast site.

Traffic in the area will increase due to the mine and the number of large trucks in the area will rise. Often such trucks are seen as undesirable by potential home buyers.

Students attending the Sycamore Elementary School and the Corona Foothills Middle School will face exposure to this traffic. According to the Vail School District bus schedules, children along South Wentworth Road north of the intersection with East Sahuarita Road are picked up by buses at around 7:00 am and returned at about 3:00 p.m. Children along South Wentworth would face to mine traffic during these times.

While there are factors associated with the operations that could prove to be detrimental to the Fair Market Value (FMV) of nearby residences, the available market data for homes in mining areas does not provide a clear link to a decline in property values caused by nearby mining operations that are conducted in compliance with all applicable health, safety and environmental laws.

BLM compared the FMV of homes near the Red Mountain Mine, an active quarry in Maricopa County, Arizona to those in the vicinity not located near an active mine. All of the homes in the comparison were built when the mine was in production and engaged in activities such as blasting and crushing. The homes range in price (or FMV) from \$400K to \$650K. Homes adjacent to the mine average \$219.52 per square foot. Three other groups of homes, each one located adjacent to a golf course, were found to have an FMV at an average of \$231.88, \$177.16, and \$183.61 per square foot (source www.zillow.com). These statistics show that the FMV of homes are dependent on many factors and the impact of a mine on home prices cannot be isolated from these other factors.

In the neighborhood directly adjacent to the Red Mountain property, the FMV of homes nearest the golf course were the highest at \$231.88 per square foot. Those nearest the mine sold for \$219.52 per square foot indicating that there may be a discount for homes nearest the mine. However, homes in the center of the subdivision (neither bordering the mine or the golf course) indicated they have an FMV of \$183.25 per square foot. If there was a discount associated with proximity to the mine, homes near the center of the subdivision should not sell for less than those near the mine. On this basis we can conclude that the difference in the FMV of homes near the mine is less than the FMV of homes near the golf course because of the increase in value associated with proximity to a golf course and not a decrease caused by proximity to a mine.

- 4.6.2 No Action Alternative: The No Action alternative will have a small negative effect on employment, and business development and result in a reduction in the County tax base.

Mining activities that are not conducted in accordance with all applicable health, safety and environmental regulations could result in lower area property values and the no action alternative will eliminate this possibility.

4.6.3 Mitigation: None

4.6.4 Residual impacts: None

4.7 Access and Transportation

4.7.1 Proposed Action: As a result of the proposed action, truck traffic will increase by approximately 16 to 32 trucks per day making 32 to 64 back and forth trips. This increase in traffic will be in addition to traffic generated by any other source in the immediate vicinity. According to statistics reported in the Pima Association of Governments (PAG) Roadway Segment Traffic Counts, August 2, 2006, the average number of vehicles on Wentworth Road between I-10 and Sahuarita Roads on May 2, 2006 was 1742. The Andrada Quarry traffic represents an increase of 1.8 to 3.6% over the 2006 levels.

The increase in traffic would be greatest along Wentworth Road as haul trucks from the mine will use this road to access I-10. Along the stretch of road between the mine and the first intersection (E. Sahuarita Road), traffic would increase from 32 truck trips per day to 64 truck trips per day. Individuals who frequent Wentworth Road at the Sahuarita Road intersection would experience the greatest impacts due to mine traffic. As overall traffic increases due to the influx of traffic from additional intersections, the impacts of mine traffic would decrease as a percentage of overall traffic and as roads and highways become larger to accommodate the larger traffic loads.

Traffic along Wentworth Road is predominantly residential/commuter consisting of cars and light trucks. Additional large trucks carrying crushed stone will be a noticeable addition to this traffic. During the life of the mine, increased urbanization will result in more traffic on Wentworth which will be cumulative with the mine traffic.

Haul traffic from the Andrada Quarry and any other quarry that is currently proposed would not commingle until the traffic reaches I-10. Although any commingling would represent a cumulative impact, as a percentage of overall traffic on I-10, the percentage of additional traffic would be low.

4.7.2 No Action Alternative: Current quarry traffic will continue to use Wentworth Road to I-10 and Sahuarita Road to I-19.

4.7.3 Mitigation: Improved portions of road and trail will be rehabbed to pre-project condition.

4.7.4 Residual impacts: None

4.8 Visual Resources

4.8.1 Proposed Action: The proposed expansion of quarrying operations onto federal minerals will result in the leveling of a small hill. This hill has been scarred by previous mining activities. Removing the hill would change the view from short sections of Sahuarita Road as well from view points to the immediate west of the quarry.

4.8.2 No Action Alternative: Quarry activities will continue on Andrada's private lands. The hill proposed for removal will remain in its current state.

4.8.3 Mitigation: None

4.8.4 Residual impacts: Evidence of reclamation will be visible on the landscape.

4.9 Mineral Resources

4.9.1 Proposed Action: Federal minerals would be mined in accordance with mining laws and regulation.

4.9.2 No Action Alternative: Federal minerals would not be mined. The no action alternative is inconsistent with upholding any valid, existing rights of mining claimants to possess the valuable minerals on their claims.

4.9.3 Mitigation: None

4.9.4 Residual impacts: None

4.10 Vegetation:

4.10.1 Proposed Action: Removal of vegetation will be required to facilitate access to the limestone to be mined. Top soil will be

preserved for re-vegetation. Seeding with native seed will complete reclamation.

4.10.2 No Action Alternative: Reclamation and re-vegetation will occur on Andrada's private holdings at end of mine life.

4.10.3 Mitigation: Reclamation plan will be implemented.

4.10.4 Residual impacts: none.

4.11 Wildlife:

In a Federal Register Notice dated December 14, 2010, the U.S. Fish and Wildlife Service designated the Sonoran population of the Desert Tortoise, *Gopherus agassizii*, as a candidate species under the Endangered Species Act. The area surrounding the Andrada quarry contains suitable habitat for the tortoise and a tortoise was found within a mile of the quarry.

4.11.1 Proposed Action: The proposed action would disturb ground in desert tortoise habitat. BLM has developed a set of measures designed to mitigate impacts to the desert tortoise and its habitat, Desert Tortoise Mitigation Policy, Instruction Memorandum No. AZ-2009-010, March 31, 2009. The policy is not directly applicable to the proposed action as the surface estate on which the action is proposed left federal ownership under a state exchange patent. The BLM does not have authority to impose mitigation measures under this circumstance. Any voluntary mitigation measures proposed by Andrada Holdings would be appended to the MPO. Voluntary mitigation measures appended to the MPO would become binding. The Mitigation Policy includes provision for compensation for lost tortoise habitat. This provision is not applicable to the proposed action as the federal government does not own the surface estate.

4.11.2 No Action Alternative: Andrada would continue to operate on its private holdings. The BLM's Desert Tortoise Mitigation Policy would not apply to the no action alternative as the policy does not apply where there is no BLM nexus.

4.11.3 Mitigation: Any voluntary mitigation measures agreed to by Andrada Holdings would be appended to the MPO and become binding on the operator.

4.11.4 Residual impacts: Desert Tortoise habitat would be disturbed under the both the Proposed Action and the No Action Alternative. Twenty three acres of habitat have been disturbed

by the existing quarry. Under the Proposed Action, fourteen more acres of habitat disturbance would occur than under the No Action Alternative.

4.12 Cumulative Impacts - Cumulative impacts are the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7)

4.12.1 Cumulative Impact Assessment Area: The Cumulative Impact Assessment Area is defined by the area outside of which effects of the proposed action are diluted to the point where reasonable analysis is not feasible. For this analysis, the area is bounded Interstate Highway 10 (I-10) to the north, the Empire Mountains to the east, Mount Fagan to the south, and Houghton Road to the west. The proposed Rosemont Copper mine and the Imerys Santa Rita marble quarry, while outside of this area, will be considered in this analysis.

4.12.2 Other Pertinent Actions within the Cumulative Impact Assessment Area: Arizona Portland Cement (APC) is proposing to reopen a limestone quarry approximately five miles east of the Andrada project in the Davidson Canyon area. Part of their project will be on Arizona State Trust lands and part will be on State Trust/Federal Mineral lands. APC has concurrent applications to the Arizona State Land Department and BLM. If that mine is approved then the cumulative impacts will be two quarries operating within five miles of each other.

Imerys Performance Minerals operates its Santa Rita marble quarry on BLM and Forest Service administered lands at Helvetia, AZ, 5.5 miles from the proposed Andrada operation. Imerys has filed a Mining Notice covering exploration work on public lands adjacent to their current operations.

The Rosemont Copper Company has proposed to operate an open pit copper mine at Rosemont, AZ, approximately seven miles south of the Andrada Quarry. The proposed mine would include a mile wide, half mile deep pit plus 4000 acres of waste

rock and tailings piles. Access to the mine would be via AZ Hwy 83.

4.12.3 Cumulative Impacts of the Proposed Action: Proposed mining activities at the Davidson Canyon quarry and at the proposed Rosemont mine are expected to add additional traffic to Highway 83 and also to Sahuarita Road. Traffic from the proposed Andrada quarry will co-mingle with traffic from the other quarries at Interstate Hwy 10.

4.12.4 Cumulative Impacts of the No Action Alternative: Mining will continue on Andrada Holdings private lands.

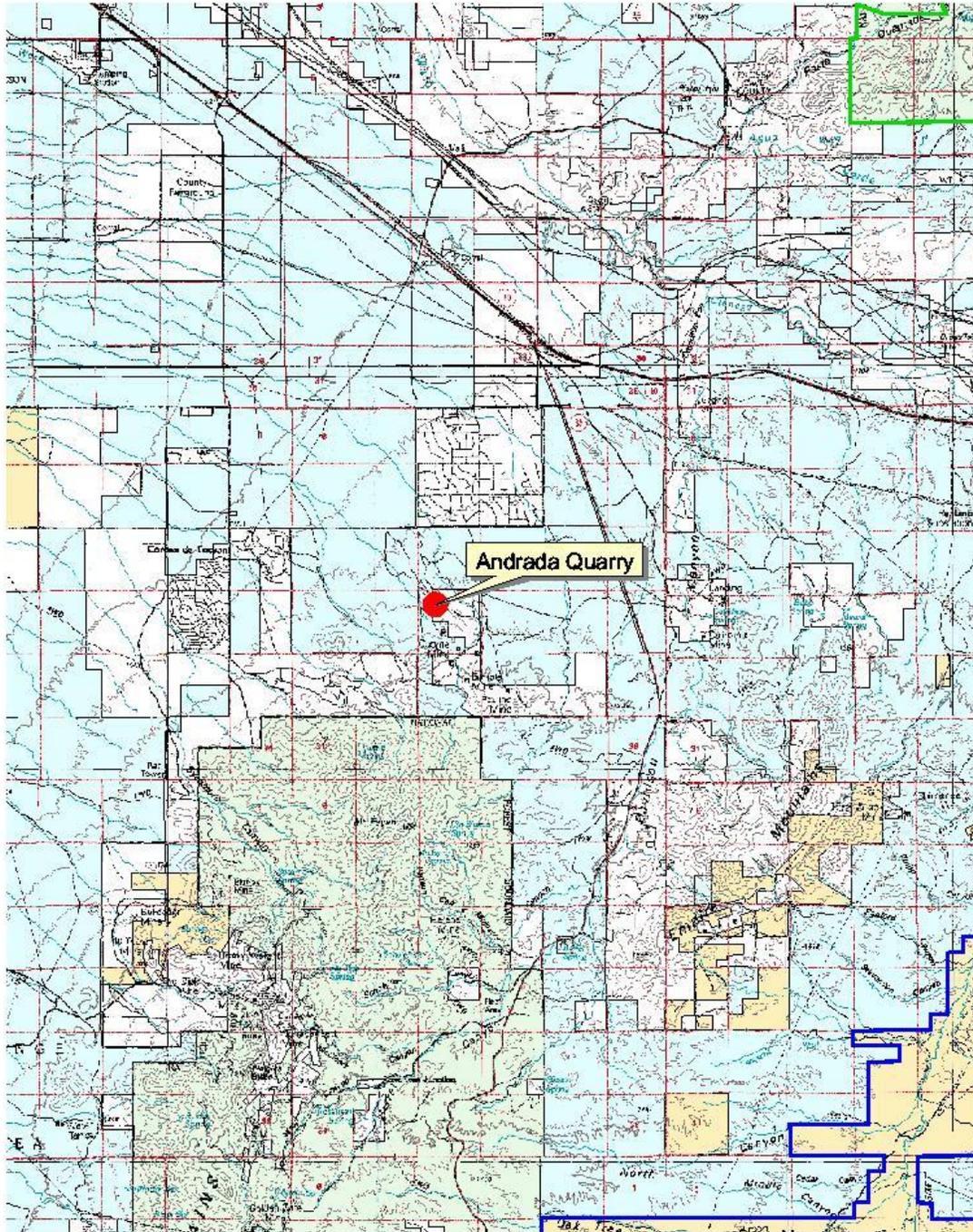
5.0 CONSULTATION AND COORDINATION

5.1 Persons, Groups, and Agencies Consulted

- Leslie Uhr, BLM- Tucson GIS Specialist
- Darrell Tersey, BLM – Tucson Natural Resources Specialist
- Ben Lomeli, BLM – Tucson Hydrologist
- Francisco Mendoza, BLM – Tucson, Outdoor Recreation Planner

5.2 List of Preparers and Reviewers

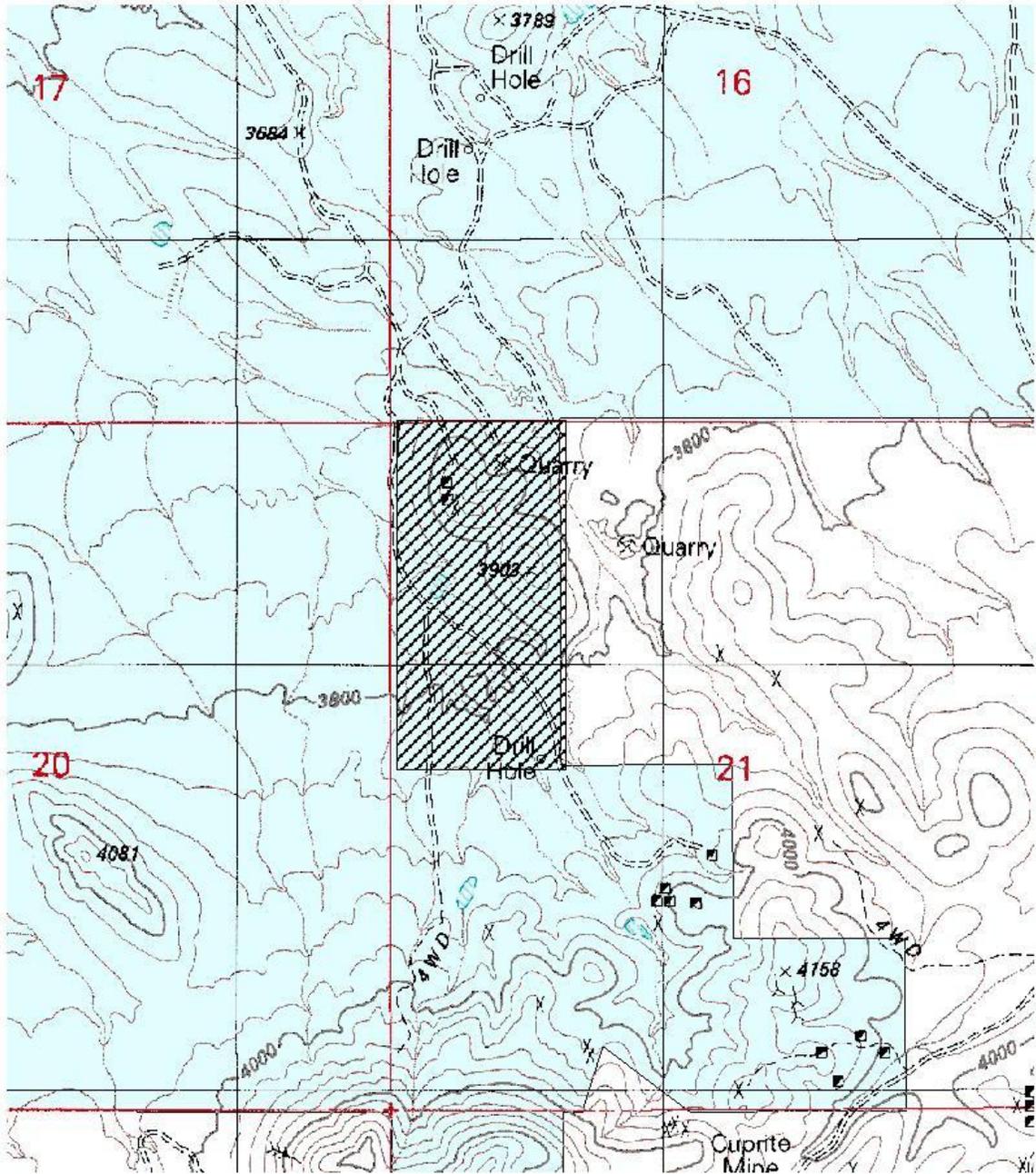
- William Auby, BLM Geologist (now with BLM – Santa Fe, NM)
- Daniel Moore, BLM- Tucson Geologist
- Karen Simms, BLM- Tucson Asst. Field Manager
- Amy Markstein, BLM- NEPA Coordinator



Location of the Andrada Quarry
1:130,000



Map 1. Project location, twenty five miles southeast of Tucson, AZ.



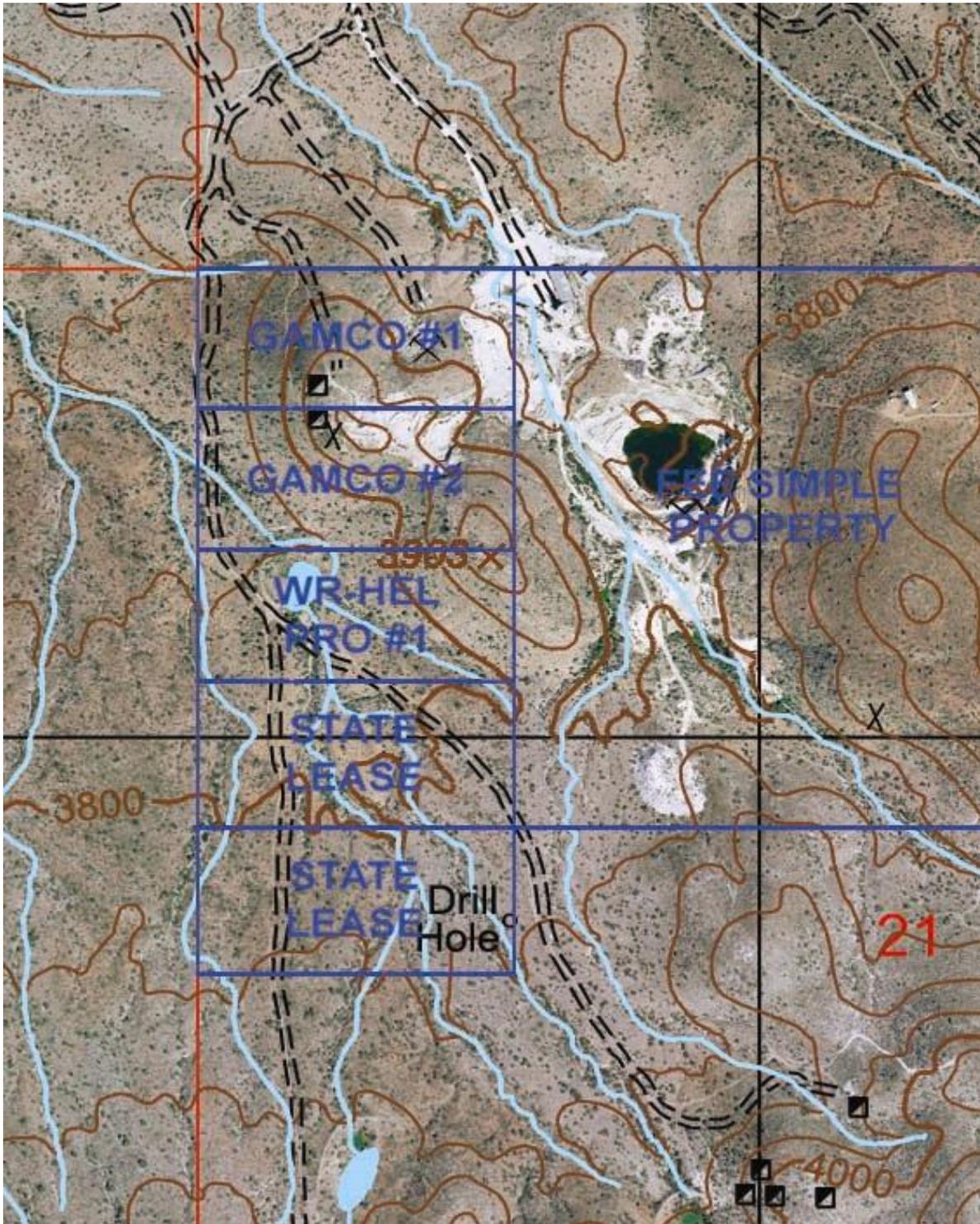
Federal Mineral

Land Status Map - Andrada Quarry

1:12000



Map 2. Federal minerals included in Mine Plan of Operation



Map 3: 7.5 Minute USGS Quadrangle Map with photo base showing claim and lease areas. 1"=~600 feet