U.S. Department of the Interior

Bureau of Land Management

Environmental Assessment

DOI-BLM-AZ-P010-2013-0052-EA

December 2015

Zerad Blue Owl Project

File Number: AZA-034937

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BLM

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1. INTRODUCTION

- **Project Name:** Blue Owl Project
- **NEPA Number:** DOI-BLM-AZ-P010-2013-052-EA
- **Proponent:** Zerad, Inc.
- **Project Office:** Hassayampa Field Office; Phoenix District
- **Case File Number:** AZA-034937
- **Location:** The site of the Proposed Action is northwest of Constellation Road approximately six (6) miles northeast of Wickenburg, Arizona, north of the Wickenburg Mountains (see Figure 1). The elevation of the project area is between 3000 and 3060 feet above mean sea level (AMSL), and is located on the Sam Powell Peak 7.5 Minute Quadrangle (2011).
- **Access:** The proposed project area is accessed via Constellation Road, a public, maintained dirt roadway, thence north on an unmaintained jeep trail approximately 3,500 ft. to the Blue Owl Claim. (see location map, Figure 2).
- **Legal Description:** The Proposed Action would occur in lands in the NW¼SW¼ , section 23, T. 8 N., R. 4 W., Gila & Salt River Meridian, Yavapai County, Arizona, about six (6) miles northeast of Wickenburg, Arizona as shown in Figure 1 of the Blue Owl Project Plan of Operations (case file number AZA-34937, originally received January 26, 2009).
- **Project Description:** The proponent, Zerad, Inc., owns one lode claim covering the project area (AMC368867), and proposes to mine specimen quality cerussite (chemical composition $PbCO_3$), also known as lead carbonate, from an outcrop with an exposed vein on top of a small hill on the claim. Zerad has been conducting exploration work under Notice AZA-033385 since 2006, and desires to commercially sell the mined specimens, necessitating a Plan of Operations (Plan). The area was previously disturbed and unreclaimed by person or persons unknown.

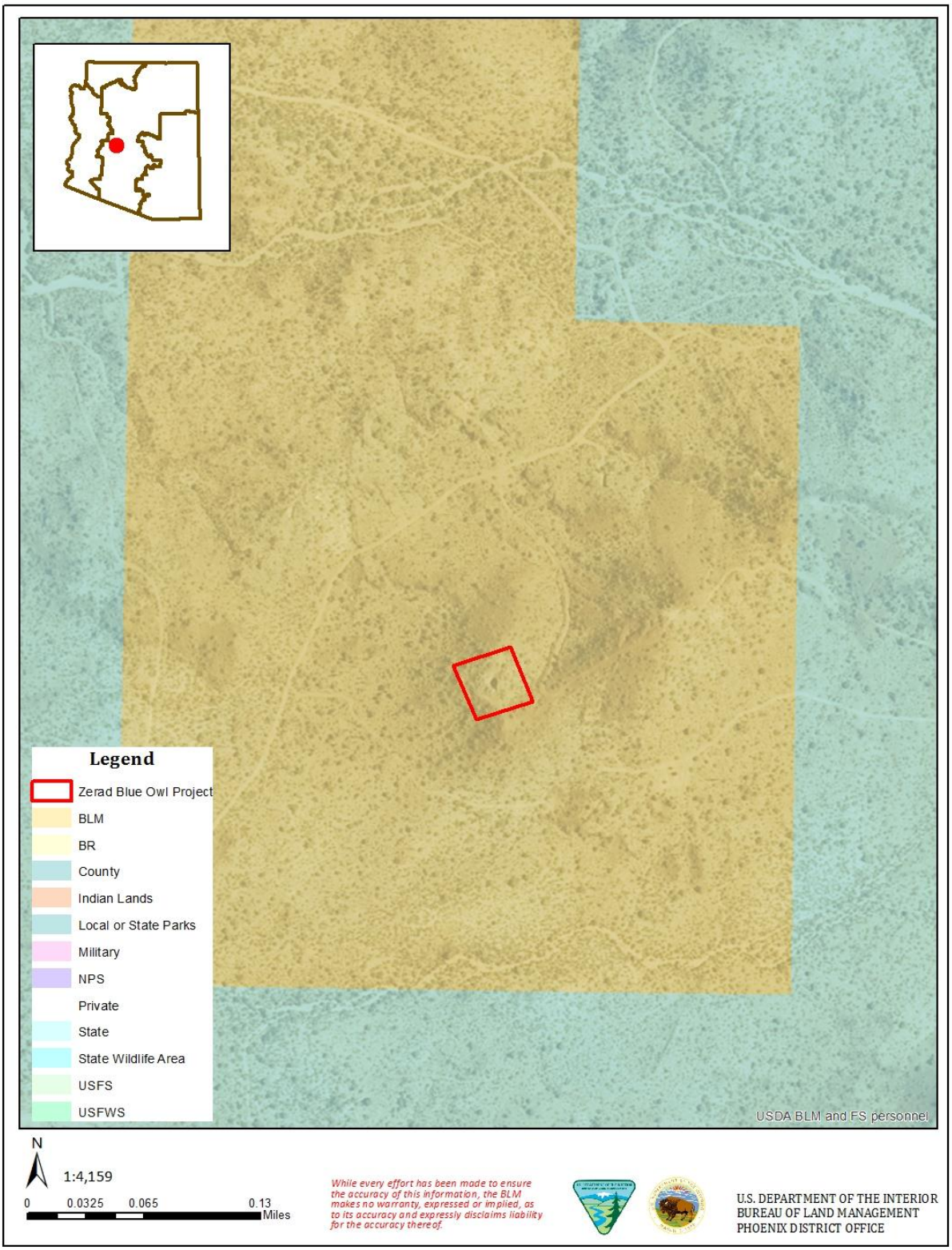


Figure 1. Map of Project Area

1.1 Purpose and Need for Action

The 1872 Mining Law allows for mining of locatable minerals on Public Lands that are not otherwise appropriated or reserved, for the purpose of mineral prospecting, exploration, development, and extraction. Surface management regulations found at 43 CFR 3809 and 43 CFR 3715 govern use and occupancy of mining claims. In accordance with these regulations, mineral operators must file a plan of operations for any mining activity beyond casual use regardless of disturbance size.

Zerad, Inc., an Arizona corporation, has submitted a Plan of Operations to BLM seeking approval to mine specimen-quality cerrusite crystals on BLM administered lands.

The need for the action is established by BLM's responsibility under Section 302 of the Federal Land Policy Management Act (FLPMA) of 1975 (43 U.S.C. 4321 et seq.), BLM Surface Management Regulations at 43 CFR 3809 and regulations found at 43 CFR 3715 (Use and Occupancy Under the Mining Laws), to respond to a submission of a plan of operations to allow an operator to extract locatable mineral resources on public lands through activities reasonably incidental to mining.

1.2 Decision to be made

This EA has been prepared pursuant to Section 102(2)(c) of the National Environmental Policy Act (NEPA), and in accordance with 40 CFR §1508.9, to assess the potential environmental impacts of the proposed Plan. Based on this evaluation of alternatives and potential impacts, the Bureau of Land Management (BLM) will make a decision determining whether to: 1) approve the Plan as submitted; 2) approve the Plan with modifications to prevent unnecessary or undue degradation of the public lands; 3) deny approval of the Plan as currently proposed because it would result in undue or unnecessary degradation.

1.3 Land Use Plan Conformance

The Proposed Action is subject to the Bradshaw Harquahala Resource Management Plan (RMP), approved in April, 2010, specifically Mineral Resources, Land Use Allocations MI-3, which states:

All public lands within the planning area are open to locatable mineral activities except for Tule Creek ACEC, legislatively withdrawn areas and other withdrawn and segregated areas, as shown on Map 12.

1.4 Scoping & Public Participation

An initial Interdisciplinary Team (IDT) meeting was held on September 9, 2013, to identify resources that could be potentially affected by the proposed action. The IDT also discussed the appropriate levels of public involvement, and reviewed the likelihood of cumulative effects.

Subsequent scoping meetings with the staff archaeologist and geologist identified the level of involvement with the State Historic Preservation Office (SHPO) under the State Protocol Agreement of December, 2014.

The Environmental Assessment, with the Plan of Operations incorporated as Appendix A, will be published on the public BLM NEPA Register at:

https://eplanning.blm.gov/epl-front-office/eplanning/nepa/nepa_register.do

for not less than 30 days for public review and comment, in compliance with the regulations at 43 CFR 3809.411(c).

The BLM also coordinated with the following:

Kris Dobschuetz, Compliance Specialist, Arizona State Historic Preservation Office

Joanie Rhyner, Project Manager, Stormwater and General Permits Unit, Arizona Department of Environmental Quality

1.5 Issues Identified

The IDT identified the project area of the proposed action to be within Category III Sonoran Desert Tortoise habitat. The IDT also identified prior disturbance from Notice level and casual use mining activity, in addition to public safety concerns with the open pit from that disturbance, and possible impacts to visual resources.

2. ALTERNATIVES

2.1 Alternative 1 - Proposed Action

Zerad, Inc., has submitted a Plan of Operations in order to mine specimen-quality cerussite ($PbCO_3$) crystals from their unpatented Blue Owl federal mining claim. Zerad has been conducting exploratory work on the claim under Notice AZA 33385 since February, 2006, but Notice AZA-33385 has since expired. The exploratory work has occurred in an area of prior mining disturbance. The area proposed for mining is a small ridge with exposure of cerrusite bearing veins. Zerad plans to excavate a 15 ft x 50 ft x 10 ft trench along the exposed vein. Total area to be disturbed by trench and rock piles is approximately 1,000 sq ft., which includes the 706 sq. ft. exploration pit. Barren rock will be removed and placed in piles through use of a Case 660 backhoe loader and Komatsu D20 dozer. When required, rock surrounding the mineralized vein will be drilled by pneumatic hammer and broken using a non-explosive expansive fracturing agent (DEXPAN®). Broken rock will be carefully removed to expose the cerrusite crystals. Approximately 50 tons of rock will be moved annually, allowing an estimated recovery of approximately 100 lbs. of crystals. The use of the expansive fracturing agent as an alternative to blasting, using hydraulic or pneumatic demolition equipment, or saw blade equipment reduces noise, project generated dust and particulate matter, and eliminates the possibility of flyrock or other material from blasting operations.

No new road construction will be necessary. No explosives will be used and no chemicals or fuel/petroleum products will be stored on site.

Further details of the operation, including overall project area, maps of previous disturbance with photographic documentation, equipment to be used, Material Safety Data Sheet (MSDS) for DEXPAN® with instructions, and the reclamation plan are included in the Plan of Operations Blue Owl Project, incorporated herein as Appendix A to this document.

2.2 Alternative 2 - Approved With Modification

This will be the submitted plan, as modified under 43 CFR 3809.411(c) to include any requirements to:

a. Prevent any unnecessary or undue degradation as defined in 43 CFR 3809.5
b. Reduce or prevent significant impacts to the human environment
c. Ensure compliance with the performance standards of 43 CFR 3809.420
d. Ensure compliance with other state, Federal, or municipal laws or regulations

The modified Plan of Operations consists of Appendix A, plus the following modifications:

2.2.1 Public Safety

General Safety

Operating areas must be maintained in an orderly manner, free of debris, trash, and other hazards, in accordance with applicable Occupational Safety and Health Administration (OSHA), Mine Safety and Health Administration (MSHA), and Arizona State Mine Inspector (ASMI) regulations. At least one ABC type fire extinguisher must be on site when any heavy equipment or vehicles are being operated.

Vehicle Operations

Vehicle operations will be conducted in a manner to prevent any unnecessary or undue degradation to the public lands. All vehicles must be presently operable. All vehicles must have current vehicle registration. All off-highway motor vehicles must have current registration if used on roads outside the mining claim. Vehicles may not be parked or positioned in a way that impedes the normal flow of traffic on existing roads.

Prior to operating equipment or vehicles on the site, the operator/driver is required to check underneath and around the equipment/vehicle for desert tortoises. If a tortoise must be moved to avoid harming it, it should be moved in accordance with Arizona Game and Fish Department's *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects* (Appendix B).

Spark arrestors must be used on chainsaws, quad-runners, and motorcycles. Vegetation must be cleared 15 feet from any site where welding, grinding, or other spark producing operation will be performed, including emergent vehicle or equipment repairs.

Accidental or Unintentional Release of Hazardous Materials

Although the Proposed Action specifies that no chemicals will be used and no petroleum products will be stored on site, operable vehicles and heavy equipment may contain petroleum products or hazardous materials. Equipment failure or operational circumstance may result in leakage or unintended discharge of chemicals or petroleum products on to the public lands.

This risk can be mitigated by maintaining on site a Chemical / HAZMAT spill response kit sufficient to mitigate small (less than 5 gallons) discharges. These kits can be commercially obtained at multiple retail or wholesale sources at reasonable cost. Any soil contaminated by inadvertent release shall be removed and disposed of at an appropriate disposal facility.

Use of DEXPAN® Expansive Fracturing Agent

The expansive fracturing agent DEXPAN®, has no documented health hazards due to flammability or reactivity, per the Material Safety Data Sheet for DEXPAN®. The substance is not Department of Transportation (DOT) classified, and has no known significant effects or critical hazards. Primary methods of exposure are via incidental contact with exposed skin or eyes.

Mitigation of this hazard will be through the implementation of the usage instructions on page 12 of the DEXPAN® product information brochure (the entire brochure and the Material Safety Data Sheet from 03/15/2013 are included as part of the Plan of Operations in Appendix A). Proper Personal Protective Equipment (PPE) as required in the usage instructions shall be worn while using DEXPAN®.

2.2.2 Vegetation

Saguaro cacti (*Carnegiea gigantean*) will be avoided under the proposed Plan. Should it be required to disturb a saguaro, an Arizona protected native plant, proper permitting for plant movement shall be obtained from the Arizona Department of Agriculture, in accordance with the laws and regulations of the state of Arizona at the time of the application. No saguaro or other Arizona protected native plant shall be disturbed without the written permission of the authorized officer and appropriate state regulatory compliance. Operator will exercise caution when operating heavy equipment in the vicinity of Arizona protected native plant species.

Reclamation will restore, as much as is practicable, the topography and vegetation of the area prior to any disturbance. Natural revegetation of grasses will be preferred. The backfilled pit and trench area will be replanted with a BLM approved seed mix.

Any palo verde will be set aside and transplanted if it cannot be avoided. Transplanted palo verde will not be moved back after project completion in order to minimize trauma to the plant.

2.2.3 Wildlife and Fish

Prior to operating equipment or vehicles, the operator/driver is required to check underneath and around the equipment/vehicle for desert tortoises. If a tortoise must be moved to avoid harming it, it should be moved in accordance with Arizona Game and Fish Department's *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects* (Appendix B).

2.3 Alternative 3 - No Action Alternative

The BLM would issue a Decision disapproving the plan for reasons outlined in the regulations at 43 CFR 3809.411(d)(3). Activity at the project area would be limited to casual use as defined under 43 CFR 3809.5. . The project area would be subject to management decisions and land use authorizations as indicated in the land use plan.

3. AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

This section describes the existing condition of the potentially impacted resources and how they would or might be affected by the proposed action and alternatives.

3.1 Definition of Terms

Common terms used to describe potential environmental impacts are defined as follows:

Adverse: An effect that is negative or detrimental to one or more resources (e.g. degrades its quality or integrity). In this document, the term "impact" is assumed to be adverse unless otherwise stated.

Beneficial: An effect that is positive or beneficial to one or more resources (e.g. enhances its quality or integrity)

Direct: Effects of the action that are a direct result of the action, occurring at the same time and place as the action.

Indirect: Effects of the action that are caused or enabled by the action, but occur later in time or space or through an intermediary, and are reasonably foreseeable (e.g. growth-inducing effects, "but-for" effects, etc.).

Cumulative: Direct and indirect effects of the action combined with the incremental, additive effects of other past, present, and reasonably foreseeable future actions, on a given resource.

Short-Term: An effect that occurs only for a short time relative to the temporal scope of the action. In this case, short term means less than the duration of the Proposed Action, in this case, three years.

Long-Term: An effect that occurs for a long time relative to the temporal scope of the action. In this case, long term means longer than the duration of the Proposed Action, in this case, three years.

Table 1. Resources and rationale for detailed analysis

Resource	Not Present	Present, Not Affected	Present, May Be Affected	Rationale
Air Quality		X		Proposed operations are below the regulatory limits for Air Quality.
Areas of Critical Environmental Concern (ACEC)	X			Project area is not within or adjacent to any designated ACEC
Cultural Resources	X			A Class III survey was conducted and no sites were found. The project is not within proximity to any listed sites.
Environmental Justice	X			None of the alternatives would disproportionately impact any low income of minority populations as described in Executive Order 12898.
Farmlands (Prime and Unique)	X			Project area is not within or adjacent to any designated Farmlands.
Floodplains	X			Project area is not within or adjacent to any designated Floodplains.
Native American Religious Concerns	X			A Class III survey was conducted and no sites were found. The project is not within proximity to any listed sites. The site has been already disturbed.
Public Safety			X	Operations could generate solid or hazardous waste.
Recreation		X		Operations area occupies less than 0.00001% of recreation area in Hassayampa Management Unit and is fenced to maintain safety.
Vegetation			X	Arizona protected plants could be disturbed by the Proposed Action.

Resource	Not Present	Present, Not Affected	Present, May Be Affected	Rationale
Visual Resources			X	Proposed Action will use heavy equipment and could affect visual resources (VRM Class II).
Water Quality (Surface and Ground)			X	Proposed Action could affect surface or ground water.
Wetlands and Riparian Zones	X			Project area is not within or adjacent to any designated wetland or riparian zone.
Wild and Scenic Rivers	X			Project area is not within or adjacent to any designated Wild and Scenic river.
Wilderness	X			Project area is not within or adjacent to any designated Wilderness.
Wildlife and Fish, including Threatened and Endangered Species, Special Status Species, and Migratory Birds			X	The project area is within Category III desert tortoise habitat.

3.2 Public Safety

3.2.1 Affected Environment

Access to the project area is through use of an existing two-track dirt road that has been designated as an open route on the applicable travel management plan. Surrounding BLM lands are used by the public for dispersed recreational activities, which may include horseback riding, and off-highway vehicle (OHV) recreation.

The mine site consists of a small pit, currently less than 750 square feet of disturbance, with an approximately 8 foot high wall along the southern portion of the excavation area. A 4-strand wire safety fence and posted signage warns recreationists of the existing high wall located along the north aspect of the ridge. The fencing further protects wildlife and livestock from inadvertent

access to the pit from the top of the high wall. Total disturbance of the pit and rock piles from processing would be approximately 1,000 square feet.

3.2.2 Alternative 1: Proposed Action

All solid waste will be removed from the site daily when operating, and disposing it at an approved facility. No hazardous materials, chemicals, or petroleum products will be stored on site, and all equipment maintenance will be performed off site at an appropriate repair facility.

The fracturing agent, brand named DEXPAN®, has no documented health hazards due to flammability or reactivity, per the Material Safety Data Sheet for DEXPAN®. The substance is not Department of Transportation (DOT) classified, and has no known significant effects or critical hazards. Primary methods of exposure are via incidental contact with exposed skin or eyes.

The safety fence will be maintained for the operational life of the project. Reclamation of the pit area and high wall will consist of filling in the pit and trenches with stockpiled material from processing and extraction. Water bars will be installed at steeper points of the access road to reduce erosion and enhance public safety.

Due to the small operational footprint and lack of ground cover or topsoil, final surface reclamation will consist of natural reestablishment of native vegetation.

3.2.3 Alternative 2: Approved With Modification

The proposed action will be implemented with additional mitigation measures for:

1. General Safety,
2. Vehicle and Equipment Operations,
3. Accidental or Unintended Release of Hazardous Materials, and
4. Usage of the fracturing agent DEXPAN®.

General Safety

Operating areas must be maintained in an orderly, workmanlike manner, free of debris, trash, and other hazards, in accordance with applicable Occupational Safety and Health Administration (OSHA), Mine Safety and Health Administration (MSHA), and Arizona State Mine Inspector (ASMI) regulations. At least one ABC type fire extinguisher must be on site when any heavy equipment or vehicles are being operated.

Vehicle and Equipment Operations

Vehicle operations will be conducted in a manner to prevent any unnecessary or undue degradation to the public lands. All vehicles must be presently operable. All vehicles must have current vehicle registration. All off-highway motor vehicles must have current registration if used on roads off of the mining claim. Vehicles may not be parked or positioned in a way that impedes the normal flow of traffic on existing roads.

Spark arrestors must be used on chainsaws, quad-runners, and motorcycles. Vegetation must be cleared 15 feet from any site where welding, grinding, or other spark producing operation will be performed, including emergent vehicle or equipment repairs.

Accidental or Unintended Release of Hazardous Materials

Although the Proposed Action specifies that no chemicals will be used and no petroleum products will be stored on site, operable vehicles and heavy equipment may contain petroleum products or hazardous materials. Equipment failure or operational circumstance may result in leakage or unintended discharge of chemicals or petroleum products on to the public lands.

This risk can be mitigated by maintaining on site a Chemical / HAZMAT spill response kit sufficient to mitigate small (less than 5 gallons) discharges. These kits can be commercially obtained at multiple retail or wholesale sources at reasonable cost. Any soil contaminated by inadvertent release shall be removed and disposed of at an appropriate disposal facility.

DEXPAN® Usage

The expansive fracturing agent DEXPAN®, has no documented health hazards due to flammability or reactivity, per the Material Safety Data Sheet for DEXPAN®. The substance is not Department of Transportation (DOT) classified, and has no known significant effects or critical hazards. Primary methods of exposure are via incidental contact with exposed skin or eyes.

Mitigation of this hazard will be through the implementation of the usage instructions on page 12 of the DEXPAN® product information brochure (the entire brochure and the Material Safety Data Sheet from 03/15/2013 are included as part of the Plan of Operations in Appendix A). Proper Personal Protective Equipment (PPE) as required in the usage instructions shall be worn while using DEXPAN®.

3.2.4 Alternative 3: No Action Alternative

The No Action Alternative would consist of continuance of casual use activities currently occurring on the site. Notice AZA-33385 expired 02/28/2010. Although a new notice was submitted 10/07/2010, it is in pending status due to the prior submittal of the 01/26/2009 submittal of a plan of operations.

In accordance with §3809.5, casual use means activities ordinarily resulting in no or negligible disturbance of the public lands or resources. Casual use generally includes collection of geochemical, rock, soil, or mineral specimens using hand tools or other non-motorized means.

Current safety measures preventing safety hazards to the public, wildlife and livestock resources would be maintained.

3.3 Vegetation

3.3.1 Affected Environment

The predominant vegetation type within the project area is primarily desert scrub, dominated by creosote, with occasional palo verde and cacti (mostly saguaro and barrel cacti with some ocotillo and rare cholla). The presently disturbed area where the pit is located is devoid of vegetation. The ridge top adjacent to the pit high wall exhibits sparse grasses up to the existing road disturbance. The road surface consists of loose stone comprised of weathered material. Palo verde and creosote are found adjacent to and along the designated access roadway. Desert shrubs and sparse grasses are found north and west of the areas presently disturbed.

3.3.2 Alternative 1: Proposed Action

Reclamation will consist of leveling the trench and pit area by backfilling with previously excavated material. Water bars will be installed at steeper sections of the road on the hill. The site will be allowed to revegetate naturally. Reclamation activities will commence upon completion of mining operations.

3.3.3 Alternative 2: Approved With Modification

Adverse impacts to vegetation will be reduced under Alternative 2 as compared to Alternative 1 due to several design features. Saguaro cacti are an Arizona protected native species. Harvesting or moving saguaro cacti is authorized through the Arizona Department of Agriculture, in accordance with the laws and regulations of the State of Arizona. No saguaro or other Arizona protected native plant shall be disturbed without the written permission of the authorized officer and appropriate state regulatory authority. Operator will exercise caution when operating heavy equipment in the vicinity of Arizona protected native plant species.

Reclamation will restore, as much as is practicable, the topography and vegetation of the area prior to any disturbance. Natural revegetation of grasses will be preferred. The backfilled pit and trench area will be reseeded with a BLM approved seed mix.

Palo verde will be set aside and transplanted if necessary. Transplanted palo verde will not be relocated back to harvest site after project completion in order to minimize trauma to the plant.

3.3.4 Alternative 3: No Action Alternative

The no action alternative would not impact current vegetation patterns and species distribution. Occasional traffic along the existing road and casual use work within the existing pit would not have any significant effect on vegetation, and would not affect Arizona protected native plant species.

3.4 Visual Resources

3.4.1 Affected Environment

The Bradshaw Harquahala Resource Management Plan designates the operations area of the proposed action as Visual Resource Management Class II (VRM II), which has the Desired Future Condition (DFC) of retaining the existing character of the landscape. Changes must "repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape."

The present condition of the project area generally blends in to the existing landscape, with the exception of the high wall safety fence. The small excavation on the site is not immediately noticeable to passing users on existing roads.

3.4.2 Alternative 1: Proposed Action

The proposed action would introduce some elements which may temporarily alter the existing character of the landscape, specifically, vehicles and heavy equipment used for earth moving and extraction. These vehicles would only be present on an intermittent basis between October and April for the three year duration of the proposed action.

Once operations cease, all equipment would be removed from the site and reclamation would be promptly initiated. The vegetation community and physical topography of the site would meet the DFC for VRM II. Reclamation would consist of pushing material into excavated areas and reseeding and / or replanting as necessary to stabilize and level off the area. If final reclamation eliminates the high wall falling hazard, the safety fencing could be removed and the DFC would be met.

3.4.3 Alternative 2: Approved With Modification

No modifications to the proposed action are required to achieve the Desired Future Condition of the visual resources of the area.

3.4.4 Alternative 3: No Action Alternative

Rejecting this plan and maintaining operations under casual use activities would not in the short term achieve the DFC for Visual Resource Management Class II. As long as the pit with high wall exists, the fence would need to be maintained for safety purposes. It would therefore be possible that impacts to the Visual Resources would remain. The operator would have to reclaim the pit area and eliminate any safety hazards before his interest in the claim could be released.

3.5 Water Resources

3.5.1 Affected Environment

There is an unnamed ephemeral wash down slope from the existing pit that ultimately empties into Blue Tank Wash. No protected waters, riparian area, or perennial waters are located within or immediately impacted by the proposed action.

3.5.2 Alternative 1: Proposed Action

Under section 402(p) of the Clean Water Act (CWA) and regulations found in 40 CFR 122, stormwater discharges associated with industrial activity are prohibited to waters of the United States unless they are covered under an authorizing permit. The U.S. Army Corps of Engineers (COE) administers Section 404 permitting of the CWA regulating discharge of dredged or fill material into "waters" of the United States, which includes lakes, reservoirs, wetlands, and perennial and ephemeral streams and washes. No jurisdictional waters of the U.S. are present within the project area.

No water is required for the operation as proposed. There will be no effect to groundwater resources. In Arizona, stormwater discharges are covered by Arizona Pollutant Discharge Elimination System (AZPDES) permits. According to the Arizona Department of Environmental Quality, operations with total disturbed area of one acre or less are not required to obtain coverage under the AZPDES Multi Sector General Permit or Construction general Permit (personal communication, 2/10/2015).

The proposed reclamation of the site using water bars and excavated material to fill in excavated areas will effectively reduce surface runoff, stabilize slopes, and prevent unnatural sediment loads from entering adjacent ephemeral washes.

3.5.3 Alternative 2: Approved With Modification

No modifications to the proposed action are required to protect the water resources.

3.5.4 Alternative 3: No Action Alternative

Rejecting this plan and maintaining operations under the casual use provisions of the 43 CFR 3809 regulations would create a permanent high wall with small catchment basin that could change local water infiltration patterns and change surface runoff characteristics. Due to the extremely small area of disturbance, these micro-changes would not significantly impact the water resources in the area.

3.6 Wildlife and Fish (including threatened and endangered species)

3.6.1 Affected Environment

The project area is located in a previously disturbed site surrounded by Sonoran desert scrub habitat. The project area is located within habitat designated as category III Sonoran desert

tortoise habitat in the Bradshaw Harquahala Resource Management Plan. Category III habitat is defined as: 1) Habitat that is not considered essential to the maintenance of viable populations; 2) Habitat where most conflicts are not resolvable; and 3) Habitat that contains low to medium densities of tortoises not contiguous with medium or high densities. Since the project area has been disturbed by previous mining activities, habitat value for tortoise is diminished through loss of vegetation for forage and cover.

3.6.2 Alternative 1: Proposed Action

The project footprint is very small (1,000 sq ft.) and is in a previously disturbed site with little wildlife habitat value. Sonoran desert tortoise may occur in the vicinity in low densities. Due to low habitat quality and design features to avoid impacts to tortoises, the likelihood of adverse effects to Sonoran desert tortoises is remote.

In the proposed operation, the high wall and pit area will be fenced to protect wildlife, livestock, and humans from entering the area.

3.6.3 Alternative 2: Approved With Modification

Due to low habitat quality and design features to avoid impacts to tortoises, the likelihood of adverse effects to Sonoran desert tortoises is remote. If Sonoran desert tortoises are encountered on the project site, the operator must comply with Arizona Game and Fish Department's *Guidelines for Handling Sonoran Desert Tortoises Encountered on development Projects* (Appendix B).

Prior to operating equipment or vehicles, the operator/driver is required to check underneath and around the equipment/vehicle for desert tortoises. If a tortoise must be moved to avoid harming it, it should be moved in accordance with Arizona Game and Fish Department's *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects* (Appendix B).

3.6.4 Alternative 3: No Action Alternative

Rejecting this plan and maintaining operations under the casual use provisions of the 43 CFR 3809 regulations would create a permanent high wall. In the current configuration, the high wall and pit areas are fenced to protect wildlife, livestock, and humans from entering the area. The operator would still have to comply with Arizona Game and Fish Department's *Guidelines for Handling Sonoran Desert Tortoises Encountered on development Projects* (Appendix B).

4. CUMULATIVE EFFECTS

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 (40CFR1508.7).

4.1 Cumulative Effects Study Area

Cumulative impacts for the proposed action would affect the lands within E½SW¼, Sec. 23, T. 8 N., R. 4 W., Gila & Salt River Meridian, Yavapai County, Arizona. Most impacts would be within the active project area (less than 1,000 sq. ft.), however there would be some increased traffic during operational periods (October through April).

Cumulatively Connected Actions

4.1.1 Past and Present Actions

Past unknown operators have excavated the area of the proposed action, and reclamation of that disturbance would occur under Alternatives 1 and 2.

The no action alternative would not reclaim the existing disturbance, and would require the maintenance of a fence for safety of wildlife and personnel.

4.1.2 Reasonably Foreseeable Future Actions

There are no pending or reasonably foreseen actions in the project area. Any future proposed actions would benefit from the reclamation conducted under the proposed action by having a more natural landscape and contour for the project area.

Under the no action alternative, fencing would have to be maintained for safety purposes.

5. PARTIES CONSULTED AND SUBJECT(S)

Arizona Department of Environmental Quality (ADEQ), Joanie Rhyner, Project Manager, Stormwater and General Permits Unit, AZPDES Permitting Requirements

Arizona State Historical Preservation Office, Kris Dobshuetz, Compliance Specialist, State Protocol Consultation Requirements

6. LIST OF PREPARERS

Judd Sampson, *Geologist / IDT Leader*	Lower Sonoran and Hassayampa Field Offices
Karen Conrath, *Geologist*	Arizona State Office
Bryan Lausten, *Archaeologist*	Hassayampa Field Office
Codey Carter, *Wildlife Biologist*	Hassayampa Field Office
Mary Skordinsky, *Recreation Planner*	Hassayampa Field Office
Thomas Bickauskas, *Recreation Planner*	Hassayampa Field Office
Rem Hawes, *Manager*	Hassayampa Field Office
Gloria Tibbetts, *Planning & Environmental Coordinator*	Phoenix District Office

7. APPENDICES

PLAN OF OPERATIONS
BLUE OWL PROJECT

OPERATOR

Zerad, Inc.
425 E. Greenway Drive
Tempe, AZ 85282-6938

Principal contact: Mr. Richard E. Zimmerman
Phone/Fax: (480) 456-1010

Zerad's EIN is PII REDACTED

MINING CLAIM AND ACCESS

The site is on the Blue Owl federal lode mining claim, AMC 368687, located just off Constellation Road about six miles northeast of Wickenburg, Arizona, in the west ½ of Section 23, T8N, R4W, Yavapai County. The site is covered by the Sam Powell Peak 7.5' USGS quadrangle. Access to the site from Constellation Road is via existing dirt roads and tracks. The site and access route are shown in Figure 1.

PROPOSED OPERATION.

The proposed operation is the mining of specimen-quality cerussite crystals from a mineralized vein outcropping near the top of a small hill on the Blue Owl claim. Zerad has been conducting exploratory work on the claim under Notice AZA 33385 since February, 2006.

The area where exploration has been done and where mining is proposed is in an area previously disturbed (and unreclaimed) by others.

Figure 2 shows the area of previous disturbance by others. The previously-disturbed area covers about 5000 sq ft, including material side cast on the hillside. Figure 3 shows the small exploration pit excavated by Zerad under the Notice. This pit was wholly within the previously-disturbed area and covered about 706 sq ft. Figure 4 shows the approximately 15'x 50'x 10' deep area to be excavated by Zerad under this Plan. The rock from the trench will be placed in piles within the previously-disturbed area as shown. The total area to be disturbed by the trench and rock piles will be about 1000 sq ft, which includes the 706 sq ft of the exploration pit.

In the proposed operation, barren rock will be removed and placed in the piles by a Case 660 backhoe loader and a Komatsu D 20 dozer. These are small machines weighing less than 10,000 lbs each. Where required, the rock surrounding the mineralized vein will be drilled with a pneumatic hammer and broken using a non-explosive, expansive fracturing

agent. Broken rock is carefully removed to expose cerussite crystals. The attached photos show the operation as carried out under the Notice.

About 50 tons of rock will be moved annually, allowing the recovery of perhaps 100 lbs. of crystals.

Operations are carried out from October through April. All work is expected to be complete within three years of the date this Plan is approved.

OTHER PERMITS AND APPROVALS

No other permits are required for this operation. The minor excavation contemplated will result in Total Suspended Particle (TSP) and PM_{10} emissions that are far below the regulatory threshold for an Air Quality Permit (TSP, 25 tons per year and PM_{10}, 15 tons per year).

An Aquifer Protection Permit is only required for facilities that discharge pollutants to an aquifer or to the land surface or vadose zone in such a manner that the pollutant will reach the aquifer. Since no chemicals will be used and no petroleum products will be stored on site, no Aquifer Protection Permit is needed.

Since the site is located entirely on uplands and access is by existing roads, the proposed operation does not affect jurisdictional waters regulated under Section 404 of the Clean Water Act.

MEASURES TO BE TAKEN TO PREVENT UNNECESSARY OR UNDUE DEGRADATION.

Existing roads and tracks will be used for access to the site. No new road construction will be done.

Equipment to be used is appropriate for the small scale of the operation. The equipment can be transported on existing roads and can operate within the small area of previous disturbance.

Excavation and overburden piles will be located within the previously-disturbed area. Runoff from the piles and disturbed area will be captured within the previously-disturbed area and will not contribute sediment to local drainages. No new disturbance of the ground surface or vegetation is contemplated.

No explosives will be used in the operation. Rock-breaking (where necessary) will be by an expansive fracturing agent.

No chemicals will be used and no fuel or petroleum products will be stored on site. Equipment maintenance will be done offsite at a shop.

Waste, such as boxes, cans and bottles, will be collected and removed form site daily and deposited at a waste transfer station or other appropriate location.

No structures, storage containers, pipelines or fences will be placed on site.

RECLAMATION.

When the operation is complete, equipment and any remaining trash will be removed. The area disturbed, including that previously disturbed by others, will be reclaimed.

Rock in the piles from the proposed operation will be returned to the trench and leveled. The small "highwall" along the south side of the disturbed area will be eliminated by pushing loose material against it. Water bars will be installed at several points along the steeper portion of the road on the hill. Since the area is small, natural revegetation is proposed.

Zerad has posted a cash bond in the amount of $1228 for reclamation for 706 sq ft of disturbance under the Notice. The area of disturbance under this Plan is about 1000 sq ft, which includes the 706 sq ft covered under the Notice. Since the additional area is small (<300 sq ft) and is all within the area previously disturbed by others, no increase in bond is proposed.

MEASURES TO BE TAKEN DURING PERIODS ON NON-OPERATION.

The mine will not be operated from May through September of each year. Prior to closure each year, equipment and any remaining trash will be removed from site. Any unsafe conditions will be remedied and warning signs will be posted.

PREPARED FOR ZERAD, INC. BY MINING & ENVIRONMENTAL CONSULTANTS, INC.

Fred B. Brost

Registered Professional Engineer (Mining)
CERTIFICATE NO.
11360
FREDRIC B.
BROST
Date Signed 1/22/09
ARIZONA, U.S.A.

Expires 3/31/11

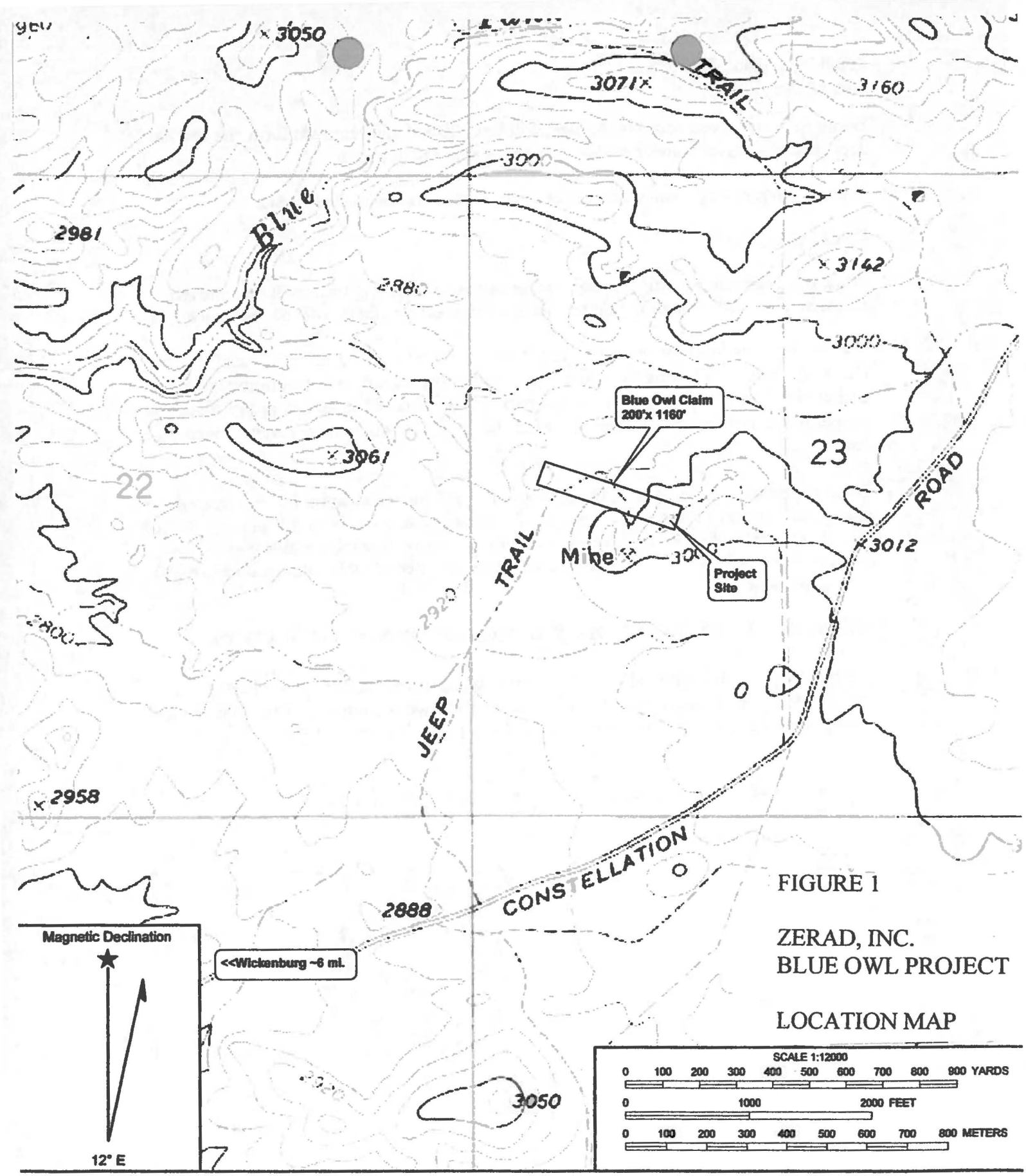


FIGURE 1

ZERAD, INC.
BLUE OWL PROJECT

LOCATION MAP

Name: SAM POWELL PEAK
Date: 1/22/2009
Scale: 1 inch equals 1000 feet

Location: 034° 01' 10.09" N 112° 38' 52.82" W NAD27
Caption: 8N 4W Sec 23

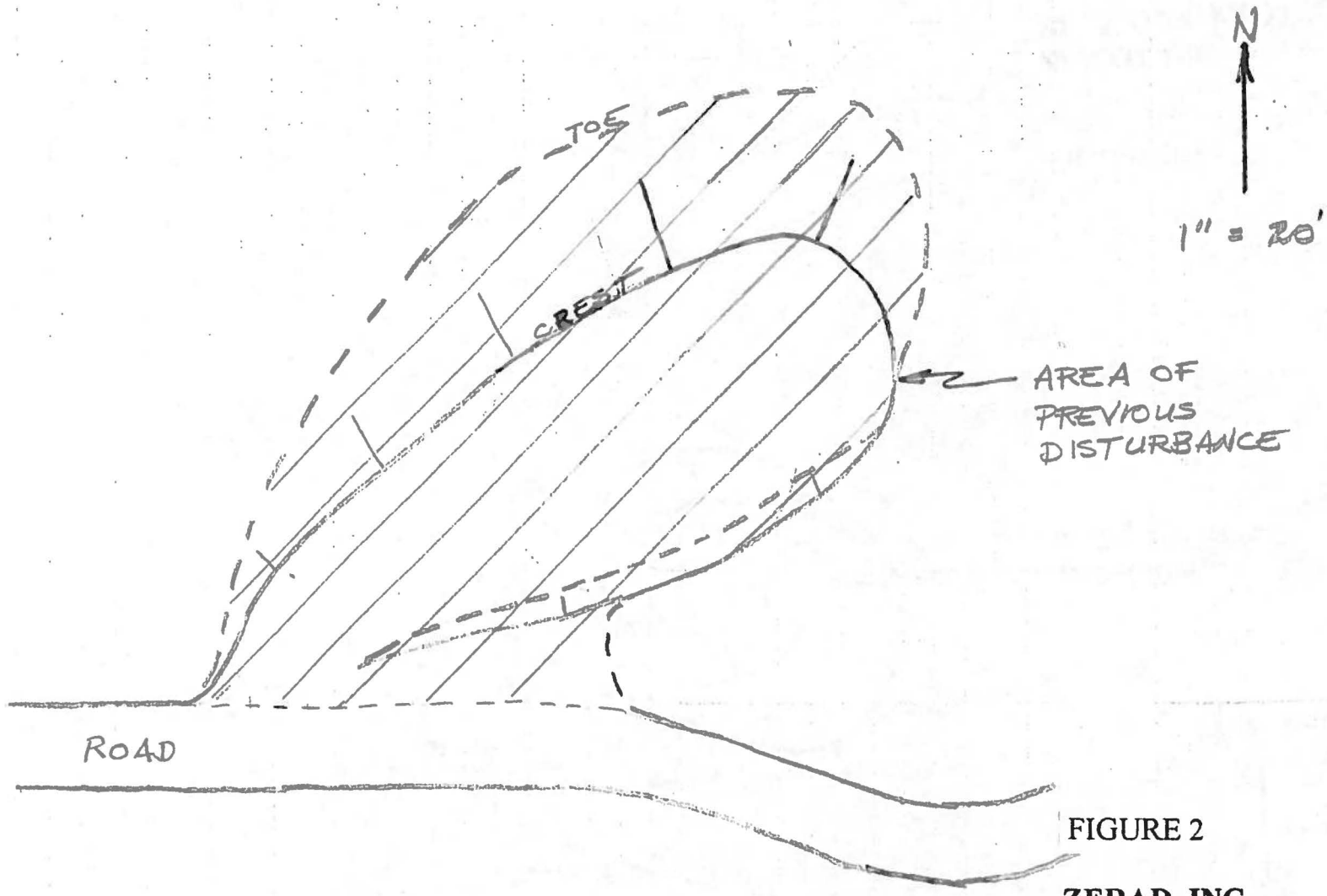


FIGURE 2

ZERAD, INC
BLUE OWL PROJECT

APPROXIMATE AREA OF
PREVIOUS DISTURBANCE

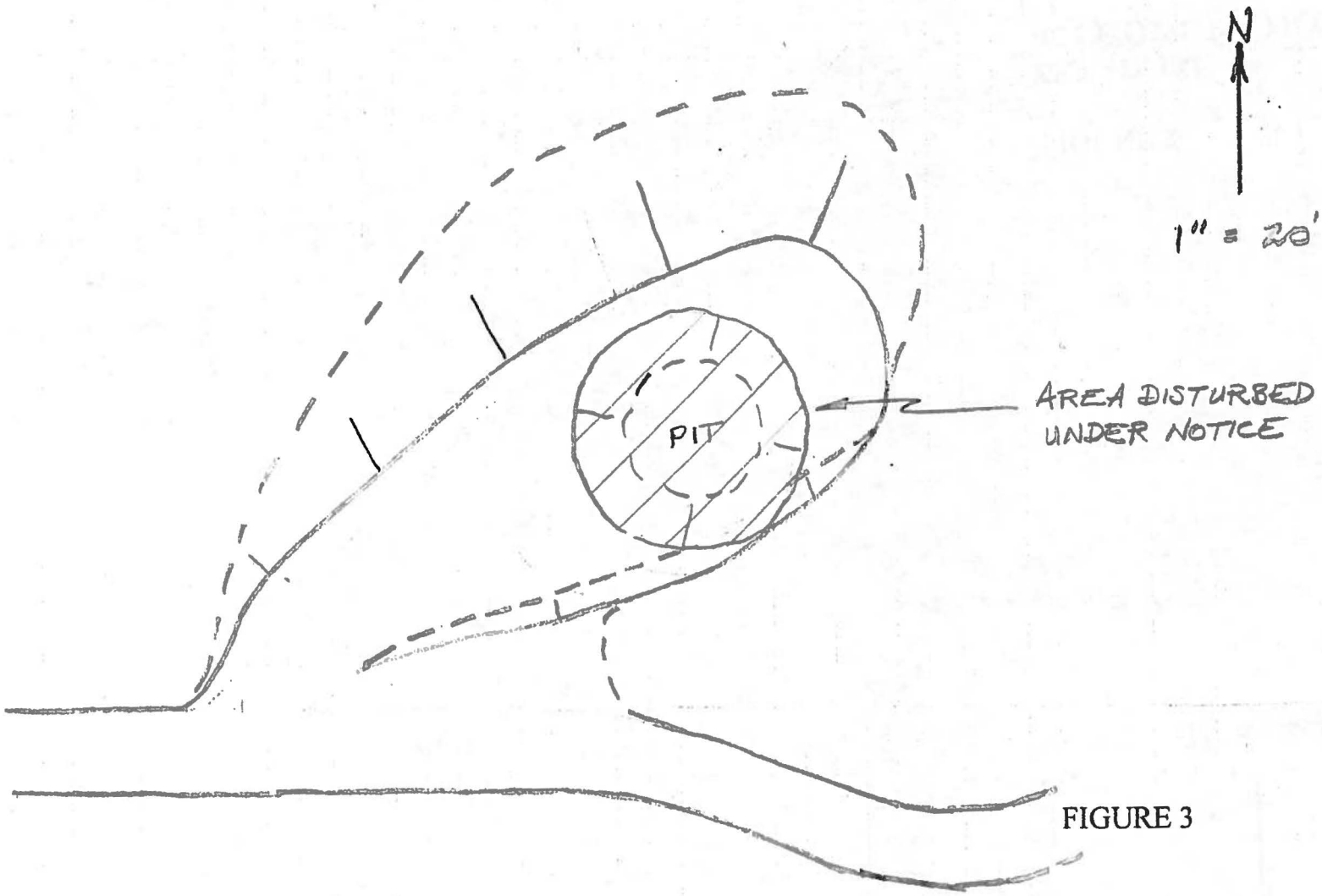


FIGURE 3

ZERAD, INC
BLUE OWL PROJECT

APPROXIMATE AREA OF
DISTURBANCE UNDER NOTICE

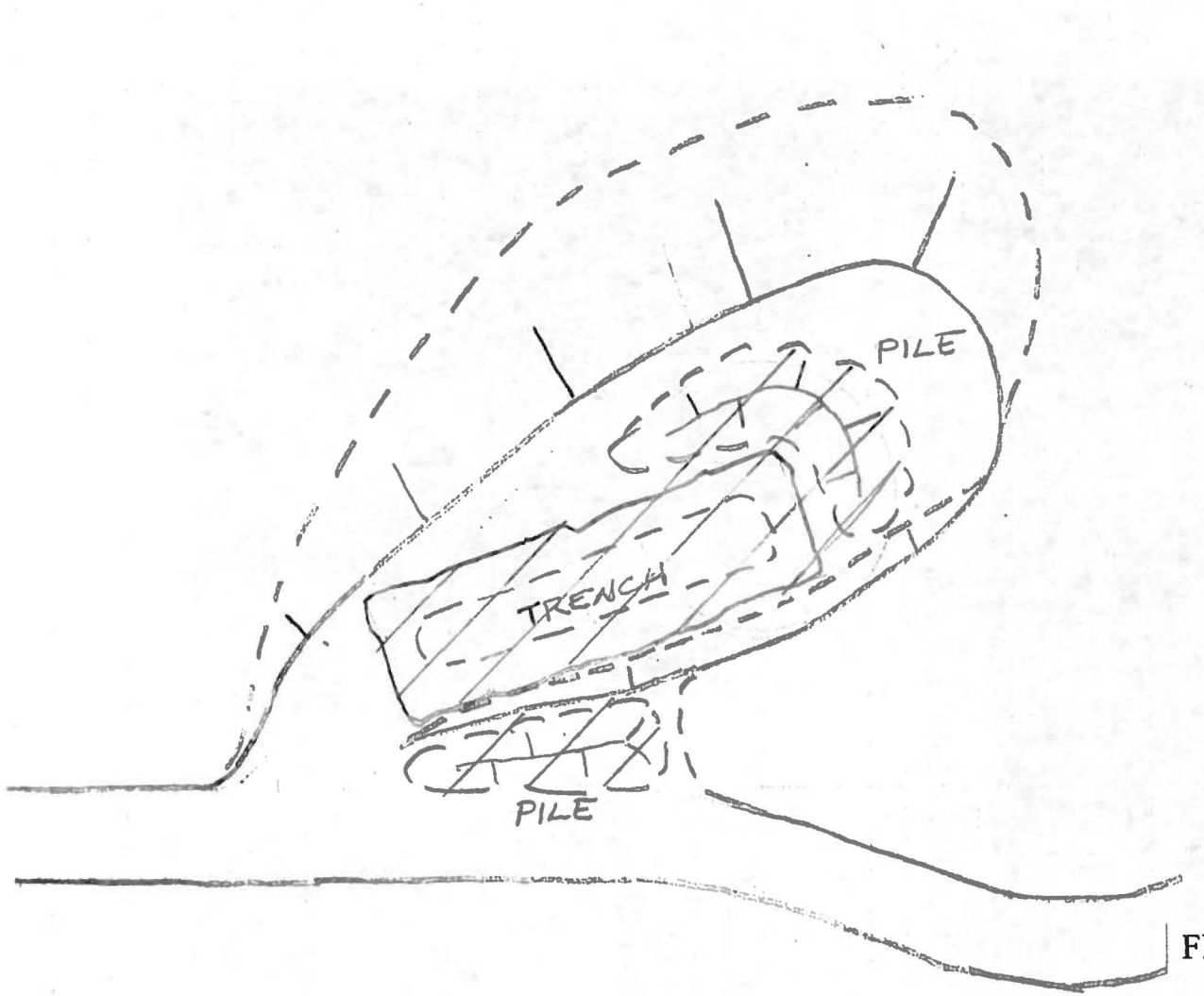


FIGURE 4

ZERAD, INC
BLUE OWL PROJECT

APPROXIMATE AREA OF
DISTURBANCE UNDER PLAN

PHOTOS

Drilling holes for non-explosive, expansive fracturing agent.

Pit area.

SAFETY DATA SHEET

DEXPAN (Non-Explosive Demolition Agent)

Section 1. Identification

GHS product identifier : DEXPAN (Non-Explosive Demolition Agent)

Other means of identification : Expanding Cement.

Relevant identified uses of the substance or mixture and uses advised against

For controlled demolition, reinforced concrete cutting, rock breaking, quarrying, stone dimension, mining, excavating...

Supplier's details : Archer Co. USA, Inc. dba/ Dexpan USA, Inc.
2031 Appaloosa Dr.
Sunland Park, NM 88063
Tel: 575-874-9188
Fax: 575-874-9108
Toll Free: 866-272-4378

Emergency telephone number (with hours of operation) : +1-575-874-9188

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Causes serious eye irritation.
Causes skin irritation.
May cause respiratory irritation.

Precautionary statements

Prevention : Wear protective gloves. Wear eye or face protection. Use only outdoors or in a well-ventilated area. Avoid breathing dust. Wash hands thoroughly after handling.

Response : IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store locked up.

Section 2. Hazards identification

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : Not applicable.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Expanding Cement.

CAS number/other identifiers

CAS number : Not applicable.

Product code : Not available.

Ingredient name	%	CAS number
Calcium hydroxide	60 - 100	1305-62-0
Diiron trioxide	1 - 5	1309-37-1
Aluminum oxide	1 - 5	1344-28-1

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Get medical attention.

Inhalation : Remove person to fresh air and keep comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 20 minutes. Get medical attention.

Ingestion : Wash out mouth with water. Move exposed person to fresh air. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : May cause respiratory irritation.

Section 4. First aid measures

Skin contact : Causes skin irritation.

Ingestion : Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : No specific fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
metal oxide/oxides

Special protective actions for fire-fighters : No special protection is required.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods and materials for containment and cleaning up

Spill : Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

United States

Ingredient name	Exposure limits
Calcium hydroxide	**OSHA PEL (United States, 6/2010).** TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust **ACGIH TLV (United States, 3/2012).** TWA: 5 mg/m³ 8 hours. **NIOSH REL (United States, 6/2009).** TWA: 5 mg/m³ 10 hours.
Diiron trioxide	**NIOSH REL (United States, 6/2009).** TWA: 5 mg/m³, (as Fe) 10 hours. Form: Dust and fumes **ACGIH TLV (United States, 3/2012).**

Section 8. Exposure controls/personal protection

Aluminum oxide	TWA: 5 mg/m³ 8 hours. Form: Respirable fraction **OSHA PEL (United States, 6/2010).** TWA: 10 mg/m³ 8 hours. **NIOSH REL (United States, 6/2009).** TWA: 5 mg/m³, (as Al) 10 hours. Form: Pyro powders and welding fumes **OSHA PEL (United States, 6/2010).** TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³, 8 hours. Form: Total dust **ACGIH TLV (United States, 3/2012).** TWA: 1 mg/m³ 8 hours. Form: Respirable fraction

Mexico

Ingredient name	Exposure limits
Calcium hydroxide	**NOM-010-STPS (Mexico, 9/2000).** LMPE-PPT: 5 mg/m³ 8 hours.
Silica, vitreous	**NOM-010-STPS (Mexico, 9/2000).** LMPE-PPT: 0.1 mg/m³ 8 hours.
Diiron trioxide	**NOM-010-STPS (Mexico, 9/2000).** LMPE-CT: 10 mg/m³, (as Fe) 15 minutes. LMPE-PPT: 5 mg/m³, (as Fe) 8 hours.
Aluminum oxide	**NOM-010-STPS (Mexico, 9/2000).** LMPE-PPT: 10 mg/m³ 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Solid. [Powder.]

Color : Gray.

Odor : Odorless.

Odor threshold : Not available.

pH : Not available.

Melting point : 1000°C (1832°F)

Boiling point : Not available.

Flash point : Not available.

Burning time : Not available.

Burning rate : Not available.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : 3.2

Solubility : Very slightly soluble in the following materials: cold water.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials, acids and moisture.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Calcium hydroxide	LD50 Oral	Rat	7340 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Calcium hydroxide	Eyes - Severe irritant	Rabbit	-	10 mg	-

Skin : There is no data available.

Eyes : There is no data available.

Respiratory : There is no data available.

Sensitization

There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

Classification

Product/ingredient name	OSHA	IARC	ACGIH	NTP
Diiron trioxide	-	3	A4	-

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Calcium hydroxide Aluminum oxide	Category 3 Category 3	Not applicable. Not applicable.	Respiratory tract irritation Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : May cause respiratory irritation.

Skin contact : Causes skin irritation.

Ingestion : Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Section 11. Toxicological information

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No known significant effects or critical hazards.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

General : Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

There is no data available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Calcium hydroxide	Acute LC50 33884.4 µg/l Fresh water	Fish - Clarias gariepinus - Fingerling	96 hours

Persistence and degradability

There is no data available.

Bioaccumulative potential

There is no data available.

Mobility in soil

Section 12. Ecological information

Soil/water partition coefficient (K_{OC}) : There is no data available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Additional information	-	-	-

AERG : Not applicable.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined

United States Inventory (TSCA 8b): All components are listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Calcium hydroxide	60 - 100	No.	No.	No.	Yes.	No.
Aluminum oxide	1 - 5	No.	No.	No.	Yes.	No.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Aluminum oxide	1344-28-1	1 - 5
Supplier notification	Aluminum oxide	1344-28-1	1 - 5

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: Calcium hydroxide; Silica, vitreous; Diiron trioxide; Aluminum oxide

New York : None of the components are listed.

New Jersey : The following components are listed: Calcium hydroxide; Silica, vitreous; Diiron trioxide; Aluminum oxide

Pennsylvania : The following components are listed: Calcium hydroxide; Diiron trioxide; Aluminum oxide

California Prop. 65

No products were found.

Mexico

Section 15. Regulatory information

Classification :

International regulations

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
Malaysia inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Taiwan inventory (CSNN): Not determined.

Chemical Weapons Convention List Schedule I Chemicals : Not listed

Chemical Weapons Convention List Schedule II Chemicals : Not listed

Chemical Weapons Convention List Schedule III Chemicals : Not listed

Section 16. Other information

History

Date of issue mm/dd/yyyy : 03/15/2013

Date of previous issue : 03/01/2010

Version : 4

Revised Section(s) : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

Prepared by : KMK Regulatory Services Inc.

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

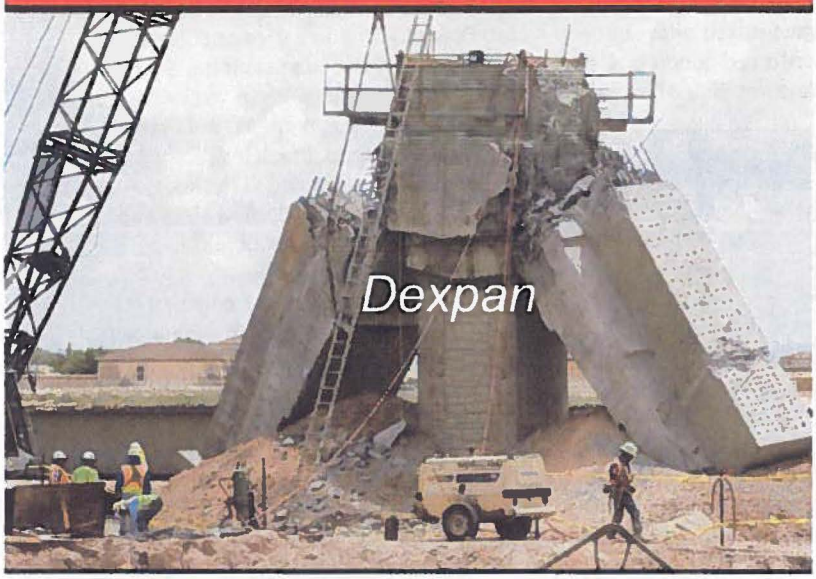
Dexpan®

A Product of Archer Company USA, Inc.

Advanced Technology

Non-Explosive Controlled Demolition Agent
By providing silent expansive cracking

For Demolition, Reinforced Concrete Cutting, Excavating, Rock Breaking, Stone Quarrying, Mining and More …



HIGHLIGHTS

- Amazing 18,000 PSI expansive strength when mixed with water.
- Easy to use, just mix with water, pour into holes, then it expands.
- Cracks reinforced concrete and rocks safely and quietly.
- An alternative to blasting, diamond blade saw, hydraulic breaker and jackhammer, which is safer, more efficient, works without noise, vibration, dust by providing silent expansive cracking.
- No special permit, insurance, training or equipment needed.
- MSDS (Material Safety Data Sheet) is available upon request.

CONTENTS:

Archer Company USA Inc is the manufacturer of Dexpan®
Toll-Free: *1-866-272-4378*
Web: www.Dexpan.com
Tel: 575-874-9188 (Se Habla Español)

Dexpan®

Non-Explosive Controlled Demolition Agent
By providing silent expansive cracking

For Demolition, Reinforced Concrete Cutting, Excavating, Rock Breaking, Stone Quarrying, Mining and More ...

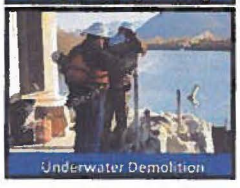
What is Dexpan®?

Dexpan® **is a powder with amazing 18,000 PSI expansive strength when mixed with common water. Poured into holes, Dexpan® breaks reinforced concrete & rock safely and quietly, while providing *SILENT* cracking. Since Dexpan® provides controlled demolition according to drilling patterns, it is very easy to break reinforced concrete and all kinds of stone into desired sizes and shapes, without noise, vibration or dust.**

**Packing I: 44 lb. box (includes Four 11 lb. bags)*
** Packing II: 11 lb. plastic container*

In demolition, concrete cutting & excavating industry, Dexpan® helps you to break reinforced concrete and rock into chunks, so you may easily cut off rebar, haul it away with a crane or truck without damage remaining part.
In mining and quarrying industry, Dexpan® helps to achieve perfect slabs and blocks from limestone, onyx, marble, granite or any other type of stone you are working with. Compares to blasting, Dexpan® avoids waste of valuable stone, high insurance, costly storage and labor. Dexpan® can also be applied along with traditional methods like primer cord, hydraulic breaker, diamond blade saw and jackhammer to help cut cost, work time and increase safety, Plus silent operation, Dexpan® is perfect for residential, school and airport area. Dexpan® helps your work to become more efficient and cost effective.

What can Dexpan help you with?



Demolition and Concrete Cutting

♦ Demolition of mass reinforced concrete, foundations for machinery, piers, pillars, beams, bridges, retaining walls
♦ Partial demolition of various concrete structures ♦ Reinforced concrete cutting

Excavating and Rock Breaking

♦ Excavation of rock ♦ Splitting of boulders
♦ Rock and slab breaking for road expansion
♦ For resident development
♦ Excavation associated with tunneling
♦ Trenching shaft sinking
♦ For various types of construction work

Stone Quarrying and Dimension

♦ Non-Explosive limestone, onyx, marble, granite quarrying ♦ Controlled expansive cracking to avoid waste of Valuable stone

Types of Dexpan®

(Depending on rock / concrete temperature)

Dexpan® I 77 to 104 F° (25 to 40 C°)
Dexpan® II 50 to 77 F° (10 to 25 C°)
Dexpan® III 23 to 50 F° (-5 to 10 C°)

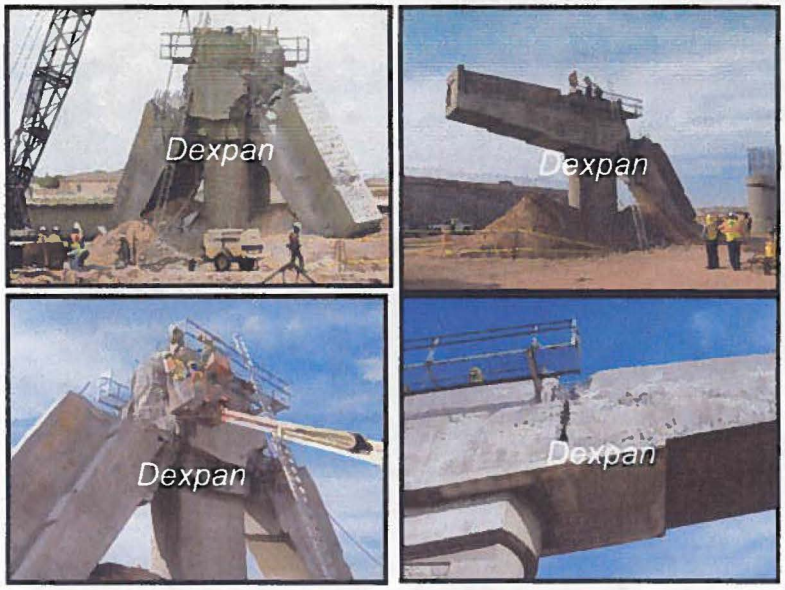
Dexpan®

Non-Explosive Controlled Demolition Agent
By providing silent expansive cracking

For Demolition, Reinforced Concrete Cutting, Excavating, Rock Breaking, Stone Quarrying, Mining and More …

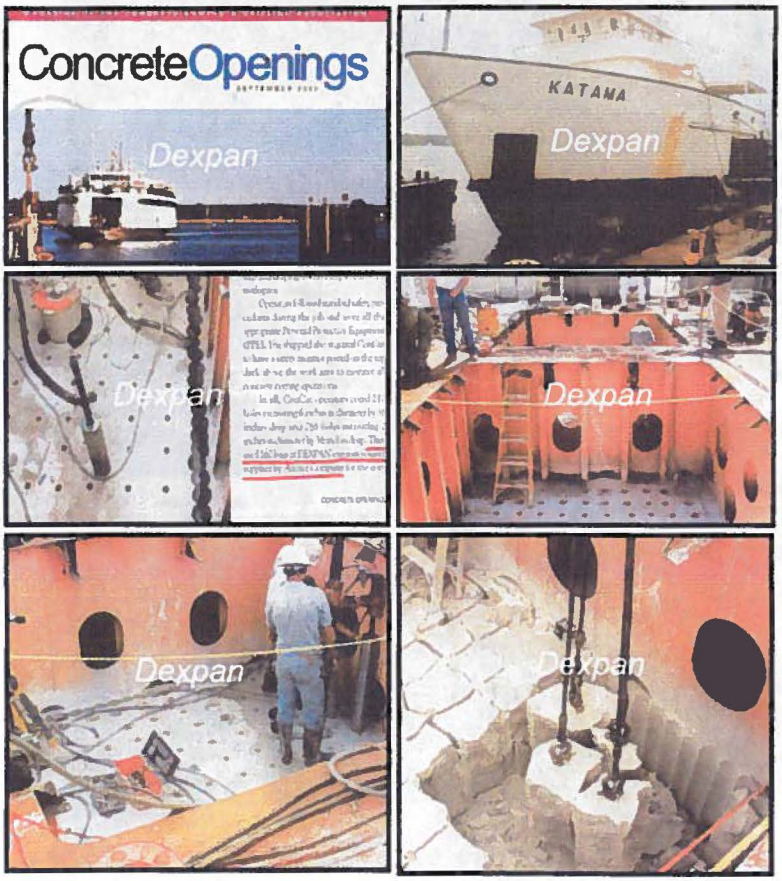
Non-Explosive Demolition of Highway Bridge Piers

At Biggs Army Airfield, El Paso, Texas United States 2007



Ferry Concrete Ballast Removal

Concrete Opening Magazine, United States 2006



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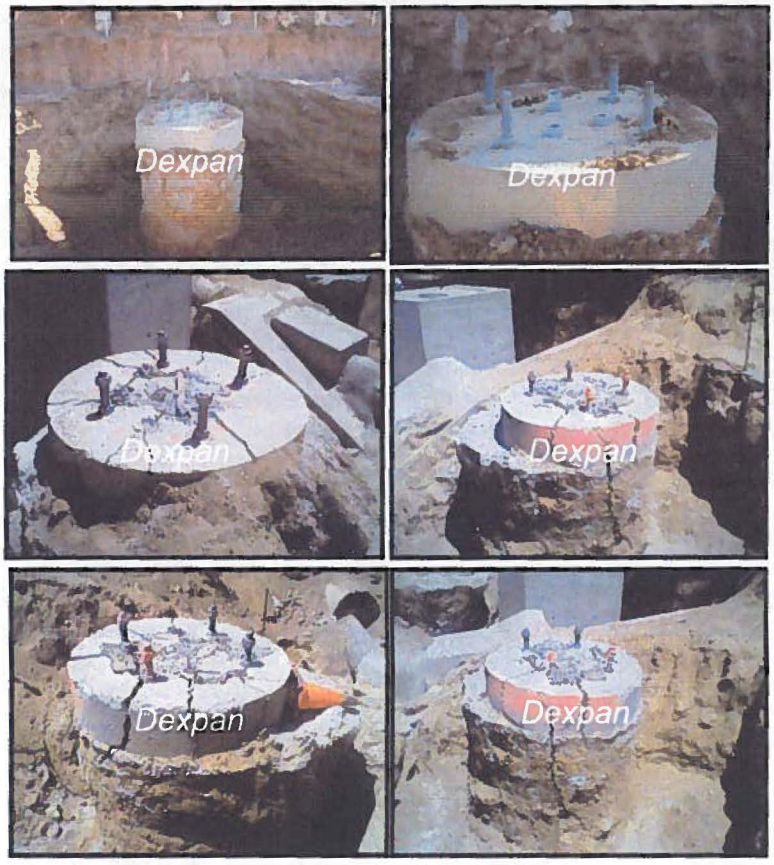
Noiseless Concrete Breaking in Residential Area

West Virginia, United States 2003

Demolition of Street Light Posts

New Mexico, United States 2008

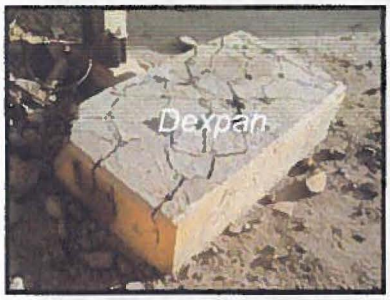


Visit us at www.Dexpan.com to view more job photos in full size.

Demolition of Reinforced Concrete Foundations

United States 2004

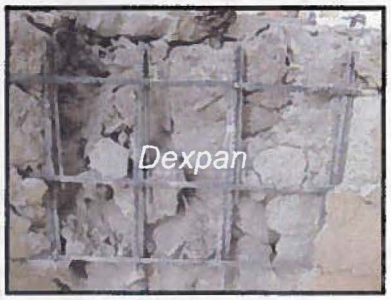
These concrete bases were heavily reinforced with rebar.



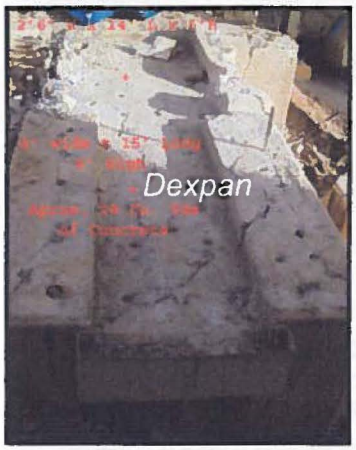
This base was 4' wide x 7'3" long x 2' high. Reinforced with rebar. Look at the great results of Dexpan.

This motor base was 3' x 3' x 3', with a few holes and Dexpan. It came apart in short order.

This base is 7'3" on the long sides and 4'7" wide and 10" high. It had 3 mats of #6 rebar with dowels every 12" around the perimeter. Take note of the heaving in the center of the base. Approximately 1 1/2 cases of Dexpan were used. The holes were drilled in 12" deep.

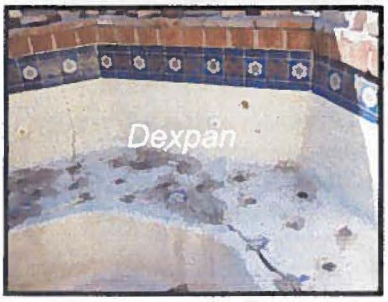


This is a side view showing the first of 4 layers of rebar in this base. These are #6 rebar (3/4" diameter). The dowels coming out of the footing are #8 rebar (1" diameter). They are not shown in this photo.



Swimming Pool Demolition

United States 2005



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By providing silent expansive cracking

For Demolition, Reinforced Concrete Cutting, Excavating, Rock Breaking, Stone Quarrying, Mining and More …

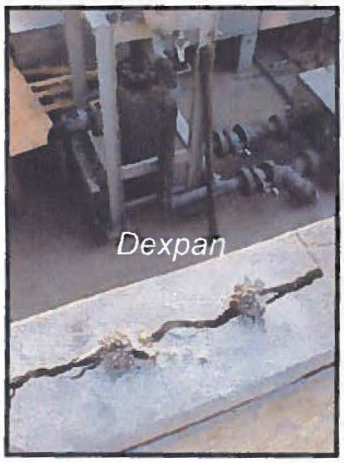
Non-Explosive Demolition of a School Stadium

Dallas, Texas United States 2002

Controlled Demolition of Reinforced Concrete Wall

that close to pumps and pipes

New York, United States 2003



The need for DEXPAN on this job was in an area where no pneumatic dust or noise was allowed and it was an area with pumps, the area was not accessible for machines.

Visit us at www.Dexpan.com to view more job photos in full size.

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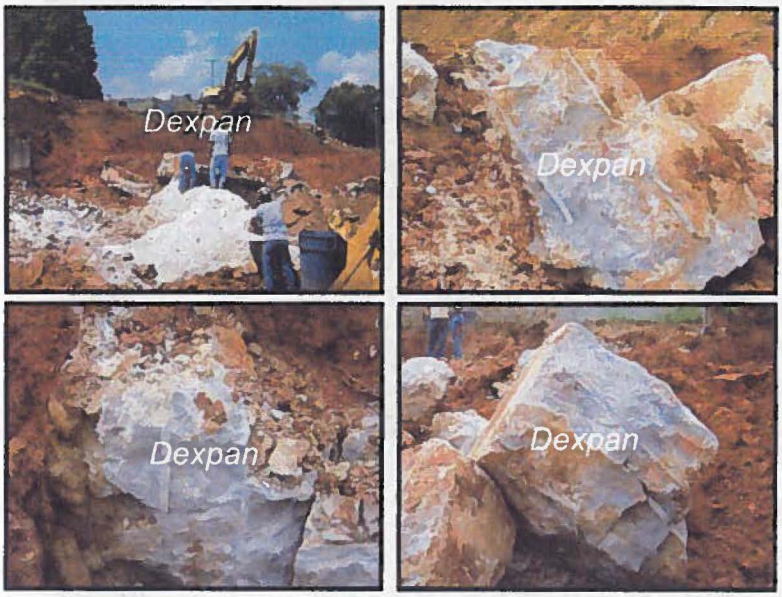
Non-Explosive Rock Blasting, Breaking & Excavation

United States 2004



"Today we worked on an area that required non-explosive rock excavation in the area of the north courtyard. We drilled a large area of what appeared to be pinnacle or bed rock. The rock being very steeply sloped and irregular it is hard to be extremely accurate on yards, but the holes (varying from 6 to 10 feet) are easily measured. We drilled the rock on an 18" pattern. We used (39) 11-pound bags (429 lbs.) of Dexpan to fill 183.83 lineal feet of hole today. 1 track-mounted drill w/ operator worked 7 hrs. and 6 men worked approximately 2.5 hrs. to perform the necessary operations. An air compressor was also used to clean rock surface and holes before filling. Jessie Scarborough from S&ME was on site monitoring operations.".

Granite Boulder Breaking

United States 2004

***Archer Company USA Inc is the manufacturer of DEXPAN.**

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Rock Breaking for Swimming Pool Project

United States 2004

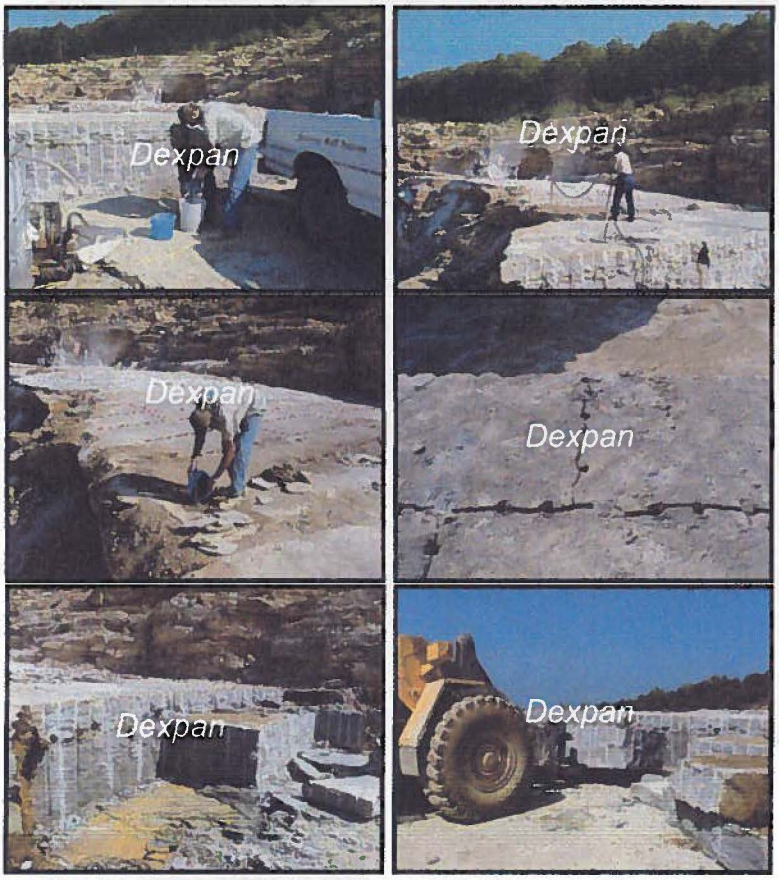
Rock Trenching and Excavating

United States 2008

Visit us at www.Dexpan.com to view more job photos in full size.

Non-Explosive Limestone Quarrying

Missouri, United States 2004



Non-Explosive Granite Quarrying

Idaho, United States 2004

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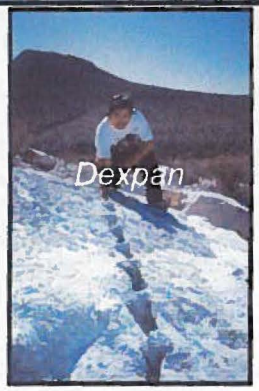
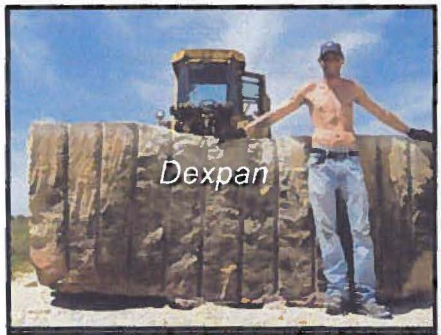
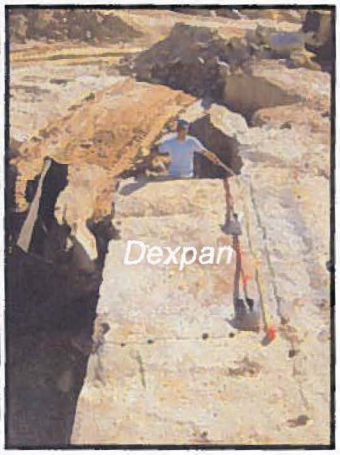
Non-Explosive Marble Quarrying

Torréon, Mexico 1995



Non-Explosive Sandstone Quarrying





Dexpan is Perfect for controlled mining and quarrying to avoid waste of valuable stone and to work safer.

Visit us at www.Dexpan.com

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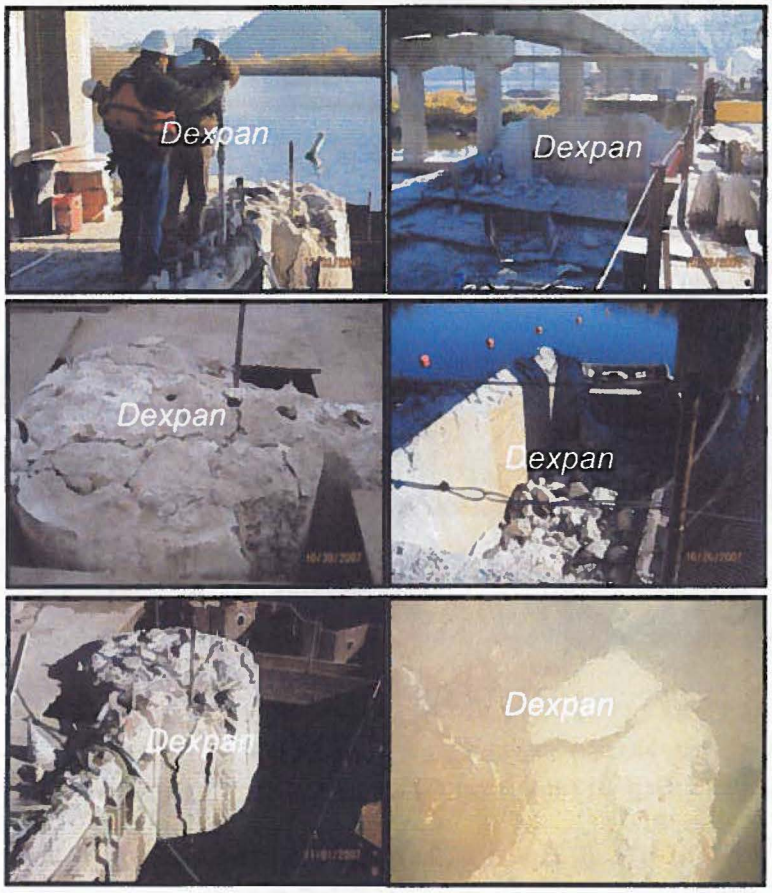
*Underwater Demolition of Bridge Piers

United States 2007 *Used plastic tubing to keep Dexpan from water.



*Underwater Rock Breaking

Cancun, Mexico 2007 *Used plastic tubing to keep Dexpan from water.

Dexpan®

Usage Instruction

Please ALWAYS wear

Rubber Gloves Safety Goggles Dust Mask

Concrete Demolition and Rock Breaking has never been EASIER!

3 Easy Steps to SUCCEED: Drill, Mix & Fill

1) Drilling ***Please call for applications with depths less than 6 inch.***

- Use **1.5 inches** (3.8 cm) drill bit, holes should be drilled **1 ft** (30 cm) apart. 80-90% of the depth, do not go through. (Diagram 1)

2) Mixing

- In a bucket, combine **0.4 gallons** (1.5 liters) of water with one 11 lb. (5 kg.) bag of Dexpan®. (Diagram 2)
- Mix well to a slurry. (a drill and paddle is recommended)

3) Filling

Use of Dexpan in **Extreme Hot Temperature could cause Blowouts.*

- Dexpan® slurry should be poured into holes within **10-15 minutes** after mixing. (Diagram 3)

Coverage: Normally one 11 lb. (5 kg.) bag of Dexpan® can fill up to **9 lineal feet** (2.5 meters) of 1.5 inches (3.8 cm) diameter holes.

Cracking Or Cutting Time: Properly mixed, the cracks may appear after 2~8 hours of filling drilled holes, depending on drilling patterns, temperature, humidity, rock or concrete hardness. Give it **24 hours** for best results.

WARNING!

IMPORTANT SAFETY PRECAUTIONS and FIRST AID:

- Read safety and operation instruction CAREFULLY.
- **SAFETY GOGGLES, RUBBER GLOVES** and a **DUST-PROOF MASK** is required.
- ****WARNING** BLOWOUTS may occur!** DO NOT look directly into filled holes.
- DO NOT breathe in dust. AVOID eye and skin contact. If eye or skin contact should occur, rinse it off IMMEDIATELY and consult doctor.
- Choose correct type of Dexpan based on rock / concrete temperature.
- Keep Dexpan® in DRY storage. Seal box / bag after use.

MSDS (Material Safety Data Sheet) and Limited Warranty are available at www.Dexpan.com

For technical support, Please call our Toll-Free
1-866-272-4378 or 575-874-9188 (USA)

Limited Warranty

- For best results, drilling and mixing are critical to Dexpan®. First time users are highly recommended to call our FREE technical support group before use (Tel: 575-874-9188).
- All products of Archer Company USA (DBA Dexpan USA) are warranted to be free from defects in materials or workmanship for one year from the date of purchase.
- Within this period, Archer (Dexpan) will, at its sole option, replace any products that fail in proper and normal use. Such replacement will be made at no charge to the customer, provided that the customer shall be responsible for any transportation cost.
- This warranty does not cover failures due to abuse, misuse, accident, or unauthorized alterations. Always follow safety precautions and usage instruction on our website.
- Written description of problem and supporting job photos are necessary to warrant this claimer.

Disclaimer

- Dexpan® may be used to break concrete including reinforced concrete, rocks including limestone, granite, marble, onyx, and flagstone. Call before you try on other material. (i.e. porous or decomposed rocks.)
- Breakage or cracks vary due to drilling pattern done by customer. Archer (Dexpan) is not responsible for any unexpected results.
- Cracking Time is not guaranteed. Allow at least 24 hours for complete set time. Archer (Dexpan) is not responsible for any job delay lost.

Procedure for Claims under Limited Warranty

Archer (Dexpan) will help customer to resolve the problem:

- In the event Dexpan® does not work, allow an extra 48 hours. If it fails after 48 hours, contact technical support before you try other means. Do not remove Dexpan® from holes. This may void the warranty if the Dexpan® is removed.
- Take photos showing job was done according to proper procedures. A written description showing purpose of the job, dimensions, drilling patterns, depth of holes, water mixing rate, weather and temperature. Both description and job photos are necessary to obtain warranty service.
- Archer (Dexpan) gives customer an analysis report showing what could be the problem. Onsite technical support may be requested for larger projects.
- Archer (Dexpan) will honor this warranty based on the evidence provided and approval.

Video 1: What is Dexpan?

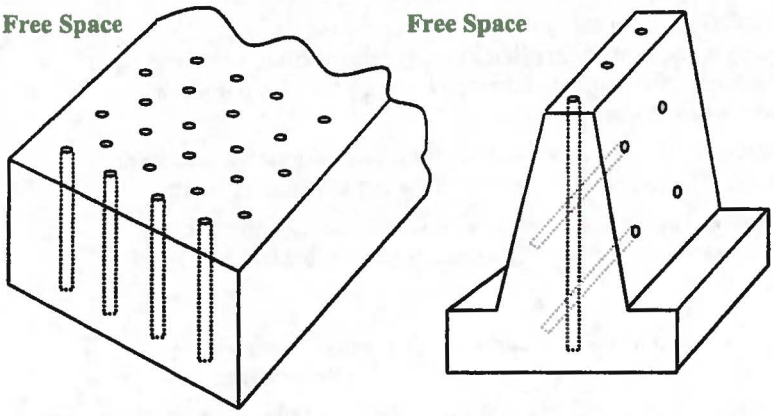
Video 2: How to use Dexpan?

Usage Tips: *(call 866-272-4378 if you have any questions)*

- **Well Designed Hole Drilling Pattern** will minimize consumption of Dexpan® by cutting into desired sizes.
- To insure success, Dexpan® needs **FREE SPACE** to expand to.
- For better results, it is important to note both air and material temperature. Material temperature is the temperature inside of the rock or concrete which can be different from the air temperature.
- In summer, the best time to use Dexpan® is in the morning when material temperature is cool.
- In summer, cover holes from direct sunlight to avoid blow-out. Example: using a tarp or damp hay to provide shade.
- If Dexpan® *completely* dries into powder and did *NOT* crack, pour additional water onto Dexpan® filled holes.

Hole Drilling Designs:

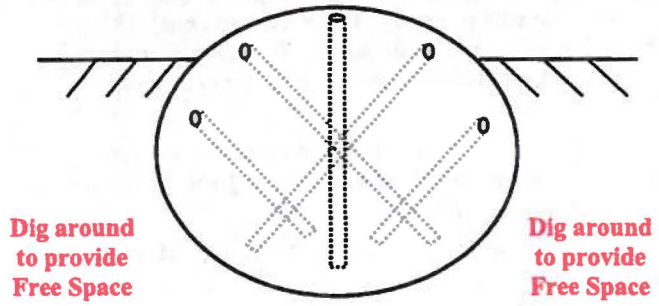
Objects have Free Space for Dexpan to Expand to:



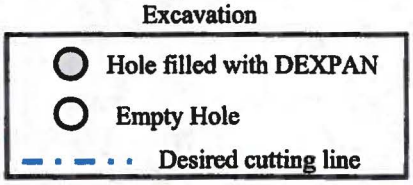
Drill Holes vertically for Regular shapes

Drill Holes at an angle for Irregular shapes

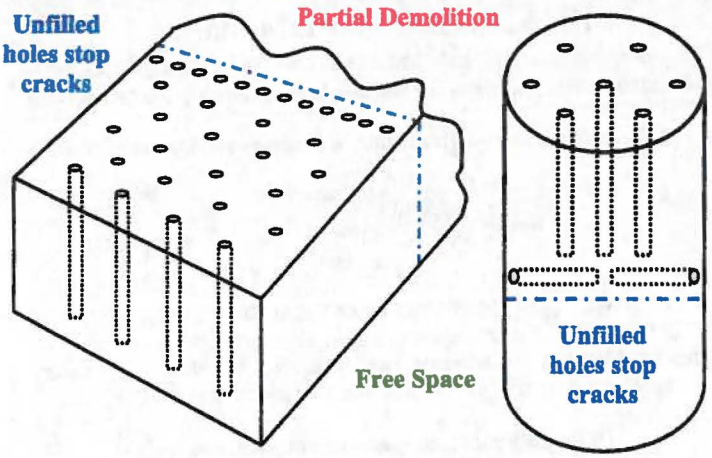
Objects DO NOT have Free Space for Dexpan to Expand to:



Underground rock Excavation

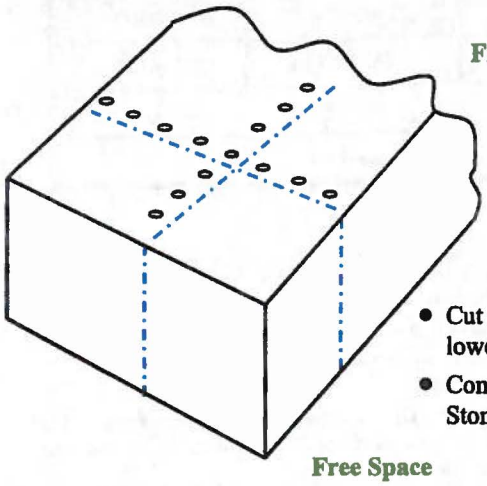


For Demolition, Reinforced Concrete Cutting, Excavating, Rock Breaking, Stone Quarrying, Mining and More …



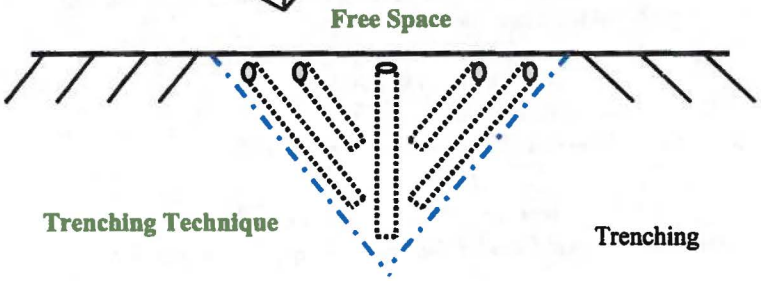
Partial Demolition with Vertical desired cutting line

Partial Demolition with Horizontal desired cutting line

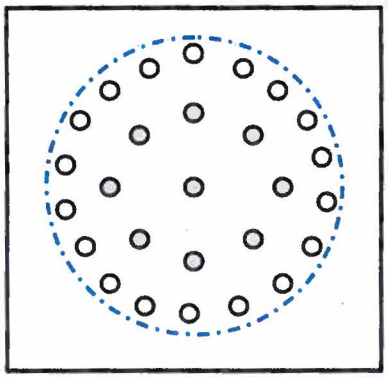


Well Designed Drilling Patterns can make your work more effective!

- Cut into desired size to lower cost.
- Controlled Breaking for Stone Quarrying.



Trenching



Tunneling

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Brief Material Safety Information

Conforms to ANSI Z400.1-2004 Standard (United States, Canada, Mexico)

Complete MSDS, Usage Instruction and Warranty are available at www.Dexpan.com

Warning: Irritating Material, Hazardous to Humans and Domestic Animals

CAUSES EYE AND SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Use only with adequate ventilation. Keep container tightly closed and sealed until ready to use. Wash thoroughly after handling.

Composition / Information on ingredients:

Name	CAS number	%
Calcium Hydroxide	1305-62-0	60-100
Silica, Vitreous	60676-86-0	5-10
Diiron Trioxide	1309-37-1	1-5
Aluminum Oxide	1344-28-1	1-5

First Aid +

Eye or Skin Contact: Immediately flush eyes or skin with plenty of water for at least 20 minutes. Get medical attention.

Inhalation: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention.

Ingestion: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Environmental Precautions

NO KNOWN significant effects or critical hazards.

The product itself and its products of degradation are NOT toxic.

Storage and Waste Disposal

Keep container tightly closed. Keep DRY in storage. Keep out of reach of children and pets.

The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material, runoff and contact with soil, waterways, drains and sewers.

Visit Dexpan® at Trade Shows

National Demolition Association | World of Concrete | International Society of Explosives Engineers | StonExpo

Toll-Free **1-866-272-4378** or **575-874-9188** (Se Habla Español)
Web: **www.Dexpan.com**

Version: 20130818

GUIDELINES FOR HANDLING SONORAN DESERT TORTOISES ENCOUNTERED ON DEVELOPMENT PROJECTS

Arizona Game and Fish Department
Revised October 23, 2007

The Arizona Game and Fish Department (Department) has developed the following guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term and/or small-scale projects, depending on the number of affected tortoises and specific type of project.

The Sonoran population of desert tortoises occurs south and east of the Colorado River. Tortoises encountered in the open should be moved out of harm's way to adjacent appropriate habitat. If an occupied burrow is determined to be in jeopardy of destruction, the tortoise should be relocated to the nearest appropriate alternate burrow or other appropriate shelter, as determined by a qualified biologist. Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim. Tortoises should be moved quickly, kept in an upright position parallel to the ground at all times, and placed in the shade. Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises. Tortoises must not be moved if the ambient air temperature exceeds 40° Celsius (105° Fahrenheit) unless an alternate burrow is available or the tortoise is in imminent danger.

A tortoise may be moved up to one-half mile, but no further than necessary from its original location. If a release site, or alternate burrow, is unavailable within this distance, and ambient air temperature exceeds 40° Celsius (105° Fahrenheit), the Department should be contacted to place the tortoise into a Department-regulated desert tortoise adoption program. Tortoises salvaged from projects which result in substantial permanent habitat loss (e.g. housing and highway projects), or those requiring removal during long-term (longer than one week) construction projects, will also be placed in desert tortoise adoption programs. *Managers of projects likely to affect desert tortoises should obtain a scientific collecting permit from the Department to facilitate temporary possession of tortoises.* Likewise, if large numbers of tortoises (>5) are expected to be displaced by a project, the project manager should contact the Department for guidance and/or assistance.

Please keep in mind the following points:

- These guidelines do not apply to the Mojave population of desert tortoises (north and west of the Colorado River). Mojave desert tortoises are specifically protected under the Endangered Species Act, as administered by the U.S. Fish and Wildlife Service.

- These guidelines are subject to revision at the discretion of the Department. We recommend that the Department be contacted during the planning stages of any project that may affect desert tortoises.

- Take, possession, or harassment of wild desert tortoises is prohibited by state law. Unless specifically authorized by the Department, or as noted above, project personnel should avoid disturbing any tortoise.