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#### DRAFT **TECHNICAL MEMORANDUM**

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cc:	Howard Plewes KLOHN CRIPPEN BERGER	
SUBJECT:	HYDROGEOLOGIC DATA SUBMITTAL, TAIL PREFEASIBILITY STUDY, WHITFORD, SILVE HAPPY CAMP SITES	

In accordance with arrangements with Mr. Sergio Gonzalez, Resolution Copper Mining, LLC (RCM), this draft technical memorandum has been prepared to summarize hydrogeologic data and provide an assessment of hydrogeologic conditions and water uses in the vicinity of the Whitford, Silver King, and Happy Camp sites (Near West area) for the RCM Tailings Prefeasibility Study (PFS). The Near West study area and locations for the three potential tailings storage locations are shown on **Figure 1**.

#### SUMMARY

1. Methods and Data Sources: Well and hydrogeologic data were compiled for a study area encompassing approximately 270 square kilometers in the vicinity of the Whitford, Silver King, and Happy Camp sites. The principal sources of well data were the Arizona Department of Water Resources (ADWR) 35-Well Registry, 55-Well Registry, and Groundwater Site Inventory (GWSI) databases. Available drillers' logs for wells in the study area were retrieved from the ADWR imaged well records within the study area. Additional geologic logs were provided by RCM for mineral exploration boreholes drilled by others. Geologic maps were obtained from Arizona Geological Survey and U.S. Geological Survey



(USGS). Additional information was obtained from previously published reports prepared for RCM, a field reconnaissance visit to the Whitford, Silver King, and Happy Camp sites August 9-10, 2012, and a groundwater level monitoring round in the region conducted by RCM in August 2012.

Well and spring locations are shown on **Figure 1**, regional hydrogeologic features are shown on **Figure 2**, hydrogeologic sections A-A' and B-B' through the Silver King and Happy Camp sites are shown on **Figures 3 and 4**, and August 2012 groundwater level elevations are shown on **Figure 5**.

**2. Hydrogeologic Units:** The potential tailings storage sites are underlain by the following principal hydrogeologic units, in order of increasing age:

- Quaternary alluvial deposits on the canyon floors and localized landslide deposits; hydraulic conductivity is estimated to be moderate to high.
- Tertiary sedimentary rocks composed of conglomerate (Gila Conglomerate) and sandstone; hydraulic conductivity is estimated to be low except where enhanced along bedding planes and fracture zones.
- Tertiary volcanic rocks composed of tuff and basalt flows; hydraulic conductivity is estimated to be low to moderate except where enhanced along interflow zones and fracture zones.
- Tertiary and Cretaceous crystalline igneous rocks; hydraulic conductivity is estimated to be low.
- Paleozoic sedimentary rocks consisting of limestone, dolomite, siltstone, shale, and quartzite; hydraulic conductivity is estimated to be low except where enhanced along bedding planes and fracture zones.
- Younger Precambrian sedimentary and igneous rocks consisting of quartzite, shale, limestone, and diabase; hydraulic conductivity is estimated to be low except where enhanced along bedding planes and fracture zones.
- Older Precambrian rocks consisting of crystalline igneous and metamorphic rocks; hydraulic conductivity is estimated to be low.

For the Whitford site, the principal mapped hydrogeologic units include Quaternary landslide deposits on the west side of Reavis Trail Canyon, a Tertiary granitoid stock in the central part of the site, and older Precambrian schist on the eastern, western, and southern edges of the site. A Precambrian granite outcrop occurs at the northwest limb of the proposed site in Reavis Trail Canyon.





For the Silver King site, the principal mapped hydrogeologic units include Quaternary alluvial deposits on the canyon floor along the axis of the canyon, a Tertiary basalt flow unit near the southwest edge of the site, Cretaceous quartz diorite in the northeast part of the site, Paleozoic units in the southeast part of the site, younger Precambrian sedimentary and volcanic rocks on the southeast flank of Silver King Canyon, and Precambrian schist on the northwest flank of Silver King Canyon.

For the Happy Camp site, the principal mapped hydrogeologic units include Quaternary alluvial deposits on the floor of Silver King Canyon near the southeast edge of the site, Tertiary conglomerate across most of the site, Tertiary tuff in Happy Camp Canyon in the north part of the site, Tertiary basalt on the south edge of the site, and younger Precambrian sedimentary rocks in the northwest part of the site.

**3. Occurrence and Movement of Groundwater:** Groundwater level measurements for the study area were obtained from ADWR databases, including the GWSI database, and the 35-Well Registries. Water level measurements were obtained at selected wells during the field reconnaissance August 9-10, and RCM conducted a groundwater level monitoring round in the region in August 2012. These data were used to assess the occurrence and movement of groundwater for this report. Groundwater in the vicinity of the Whitford, Silver King, and Happy Camp sites moves generally from northeast to southwest (**Figure 5**).

One registered well occurs in the Whitford watershed (Cottonwood well), which was visited on August 9, 2012. Depth to water level was 10.9 meters below land surface (bls). One spring is reported to occur within the Whitford watershed. The spring, designated Black Spring on the USGS 7.5 minute topographic map (2004 version), is located just south of the drainage divide near the head of Reavis Trail Canyon (northwest quarter of Section 29, Township 1 North, Range 12 East), at an elevation of about 1,345 meters above mean sea level (amsl). The spring was not visited during the reconnaissance visit in August 2012. The Google Earth images for the area show a stand of vegetation that may mark the location for the spring.

Five registered wells occur in the Silver King, Happy Camp, and Rice Water Canyon watersheds; reported groundwater levels range from 7.6 to 39.6 meters bls. The Silver King #1 well (**Figure 5**) was visited on August 10, 2012, and depth to water level was measured at 9.3 meters bls. A windmill at the site is operational and supplies a trough and stockpond. Water quality parameters were measured: temperature of the discharge water was 26.4 degrees Celsius (°C), pH was 7.04, and specific conductance was 1,214 microSiemens per centimeter ( $\mu$ S/cm). The Rice Well is located in the southwest part of the Happy Camp site (**Figure 5**), and was included in the RCM August 2012 water level monitoring round; depth to groundwater level was 16.7 meters bls.

Four springs are reported to occur within the Silver King and Happy Camp watersheds and were visited on August 9, 2012. Happy Camp Spring occurs on the floor of Happy Camp





Canyon; flow from the spring was estimated at 0.3 liters per second (L/s). There is a spring zone in the Conley Spring drainage in the Silver King area, and although the spring was dry on the day of the field visit, there are travertine-cemented cobbles in the channel and riparian vegetation in the vicinity of the spring. Bitter Spring is located in Fortuna Wash, and I-Berry Spring is located in Peachville Wash. Elevations at Happy Camp and Bitter Springs are consistent with groundwater level elevations for the regional aquifer system, but groundwater supplying I-Berry Spring appears to be a part of a local perched aquifer system dependent on local rainfall and is not believed to be part of the regional aquifer system.

The presence of Happy Camp and Bitter Springs and the relatively shallow water levels (about 10 meters bls) in the Cottonwood and Silver King wells indicate that groundwater occurs at small depths beneath the canyon floors, and is likely part of the regional groundwater flow system.

**4. Groundwater Uses:** The two registered wells in the Whitford and Bear Tank Canyon watersheds are stock wells. Of the five registered wells in the Silver King, Happy Camp, and Rice Water Canyon watersheds, two are registered as stock wells, two are registered as commercial or industrial wells, and is registered as a domestic well.

The nearest reported groundwater withdrawals to the Silver King site are for wells (D-1-13) 17dcb, (D-1-12)36bbc, and (D-1-13)32bbd (**Figure 1**). Wells 36bbc and 32bbd are RCM dewatering locations at Shafts No. 3 and 9, and the other is an Integrity Land & Cattle, LLC well (**Table 1**). Reported annual withdrawals from the RCM wells have ranged from 0 to 1,047 acre-feet. Well 17dcb has not been pumped since 2002.

The nearest reported groundwater withdrawals to the Happy Camp site are for wells (D-2-11) 01cdc, (D-2-11)01dcd, (D-2-12)07aba, (D-2-12)08daa, and (D-2-12)10ba (**Figure 1**). Reported owners of these wells include Frank Herron, Boyce Thompson Southwest Arboretum (2 wells), Harborlite Corporation dewatering location, and Harry and Helen Smith Trustees, respectively (**Table 1**). Of these five wells, the largest volumes of groundwater withdrawals have been from the Harborlite dewatering location; reported annual withdrawals for this well have ranged from 76.1 to 273.8 acre-feet.

**5.** Assessment of Potential for Migration of Tailings Water: For the Whitford site, migration of tailings water would be very limited in the Tertiary intrusive or older Precambrian rocks. While the Quaternary landslide deposits are likely highly permeable, they are underlain by the older Precambrian crystalline rocks which are generally unfractured and of very small hydraulic conductivity.

For the Silver King site, the highest potential for migration of tailings water occurs in the Quaternary alluvium along the floor of the canyon. The alluvium is underlain by younger Precambrian rocks, which would have small hydraulic conductivity except along fracture zones where hydraulic conductivity would be enhanced. During the later stages of tailings deposition in the Silver King site, substantial seepage could also occur along the eastern edge





of the Silver King site, where tailings would directly overlie Paleozoic sedimentary rocks that may locally have enhanced hydraulic conductivity along bedding planes, and along possible fractures and solution features.

For the Happy Camp site, potential for migration of tailings water in the Gila Conglomerate, which underlies most of the site, is likely to be very small. The greatest potential for migration of tailings water is in the volcanic rocks in the north and south parts of the Happy Camp main site and in the north part of the Happy Camp cleaner tailings site.

#### METHODS

Well records and hydrogeologic data were compiled for a study area encompassing approximately 270 square kilometers, shown on **Figure 1**. Data were compiled from public sources, previous investigations conducted for RCM, and field reconnaissance visits to the Whitford Canyon, Silver King Canyon, and Happy Camp sites. The principal sources of public data were published reports and databases of ADWR, Arizona Geological Survey, and USGS.

An inventory of wells was prepared using the ADWR well registry and GWSI databases. Information related to groundwater levels, groundwater uses, and reported annual groundwater withdrawals were also obtained from the ADWR databases. Well and spring locations in the study area are shown on **Figure 1**. Annual groundwater withdrawals from wells in the study area are summarized in **Table 1**. The well numbering system used in this report is given in **Appendix A**. Information from the 35-Well Registry, 55-Well Registry, and GWSI listings for the study area are provided in **Appendices B**, **C**, **and D**, respectively. The well inventories from the individual databases were not combined into a single well inventory; therefore duplicate or inconsistent information likely occurs between the databases.

Regional hydrogeologic features are shown on **Figure 2**, along with local geologic features for the area of the Whitford Canyon and Silver King Canyon watersheds. Surface geology shown on **Figure 2** is based on the geologic map by Spencer and others (1998), but was modified within the Whitford and Silver King Canyon watershed boundaries to reflect additional structural features shown on geologic maps by Peterson (1969) and Spencer and Richard (1995). Detailed descriptions of geologic units shown on the geologic map are given in **Appendix E.** 

Available drillers' logs for wells in the study area were retrieved from the ADWR imaged well records within a 4-kilometer distance around the Whitford and Silver King Canyon watersheds and are provided in **Appendix F**. Drillers' logs are available for 49 wells in the study area. In addition, geologic logs and records were provided by RCM for exploration boreholes drilled by others, and are given in **Table 2 and Appendix F**, respectively. Locations of these exploration boreholes are shown on **Figure 2**.



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Field reconnaissance visits to Whitford, Silver King, and Happy Camp sites were conducted August 9-10, 2012. Field activities included inspection of geologic units, structural features, wells, and surface water features; and measurements of pH, temperature, and specific conductance of groundwater from springs and pumping wells.

#### HYDROGEOLOGIC FRAMEWORK

The study area occurs within the Transition Zone physiographic province of central Arizona. The Transition Zone is characterized by deeply incised drainages and rugged topography. The Whitford site is located within the Whitford Canyon watershed and the Silver King site is located with the Silver King Canyon watershed. The Happy Camp main site is located mostly in the Happy Camp Canyon watershed and partly in the Rice Water Canyon watershed to the west. The Happy Camp cleaner tailings site is located within the lower part of the Whitford Canyon watershed (Potts Canyon) to the east, and the Bear Tank Canyon watershed to the west, and the Benson Spring Canyon watershed to the south.

The Whitford Canyon watershed is oriented north-northeast to south-southwest. Whitford Canyon begins at the confluence of Reavis Trail and Wood Camp Canyons. The Whitford Canyon drainage heads south from the confluence then heads southwest through Barnett Camp and into Potts Canyon. All of the drainages are ephemeral. The Whitford Canyon watershed begins about 13 kilometers north of Queen Creek near the head of Reavis Trail and Wood Camp Canyons at an elevation of about 1,550 meters amsl and ends about 5 kilometers west of Superior at the confluence of Potts Canyon and Queen Creek at an elevation of 730 meters amsl. The watershed drains an area of approximately 47 square kilometers. The Bear Tank Canyon watershed is located west of the Whitford Canyon watershed and drains an area of approximately 13 square kilometers.

The principal geologic units at the Whitford Canyon site, in order of increasing age, include Quaternary or Tertiary landslide deposits on the west side of Reavis Trail Canyon, Tertiary intrusive rocks north of the confluence of Reavis Trail and Wood Camp Canyons, and Precambrian igneous and metamorphic rocks surrounding the Tertiary intrusive (Figure 2). Detailed descriptions of geologic units shown on Figure 2 are given in Appendix E. There are no major structural features within the Whitford Canyon site.





Photograph A. Whitford Canyon looking north



Photograph B. Whitford Canyon looking south

The Silver King Canyon watershed is oriented northeast to southwest. The watershed comprises Silver King Wash and several smaller tributary washes, all of which are ephemeral. Silver King Canyon watershed begins about 10 kilometers northeast of Queen Creek at an elevation of about 1,525 meters amsl at the heads of Peachville, Fortuna, Silverado, Yellowjack, Comstock, and Conley Spring Washes. The tributaries drain into Silver King Wash which heads southwest to its confluence with Queen Creek. The watershed ends about 3 kilometers west of Superior at the confluence with Queen Creek at an elevation of 756 meters amsl. The watershed drains an area of approximately 16.6 square kilometers.

The principal geologic units at the Silver King Canyon site, in order of increasing age, include Quaternary alluvial deposits on the floor of Silver King Wash, Tertiary volcanic and sedimentary rocks, Cretaceous intrusive igneous rocks, Paleozoic sedimentary rocks, and Precambrian igneous, sedimentary, and metamorphic rocks.

The Happy Camp Canyon watershed is oriented northeast to southwest. The watershed begins about 8.3 kilometers northeast of Queen Creek at an elevation of about





1,362 meters amsl, and ends about 2.5 kilometers west of Superior at the confluence with Queen Creek at an elevation of about 732 meters amsl. The watershed drains an area of approximately 11.5 square kilometers.

The principal geologic units at the Happy Camp site, in order of increasing age, include Quaternary alluvial deposits on the floor of Silver King Wash, Tertiary volcanic and sedimentary rocks, and Precambrian igneous and sedimentary rocks (Figure 2). Detailed descriptions of geologic units shown on Figure 2 are given in Appendix E. Hydrogeologic cross sections of the Happy Camp and Silver King sites are shown on Figures 3 and 4.

The major structural features in the study area are the Concentrator, Main, and Conley Spring Faults (**Figure 2**), located in the southwest part of the Silver King site. These are normal faults down-thrown on the west side (Peterson, 1969; Spencer and others, 1998) (**Figure 3**).



Photograph C. Silver King Canyon looking northwest. Peachville Mountain in the background

#### Quaternary Alluvial Deposits

Mapped Quaternary alluvial deposits occur chiefly along Silver King Wash and Queen Creek, but also include landslide deposits on the steep western slopes of Reavis Trail Canyon in the Whitford Canyon watershed. The alluvial deposits within Silver King Canyon comprise a veneer of poorly sorted gravel and sand originating from the surrounding highlands, and extend from the central part of the Silver King site, along the east edge of the Happy Camp site, to Queen Creek. Unmapped Quaternary alluvium also occurs in some areas along canyon floors in the Whitford Canyon and Happy Camp Canyon, and where present would have very small thickness. The alluvial deposits likely have moderate to high hydraulic conductivity.

Geologic units that are classified within the Quaternary alluvial deposits include:

#### • Qy – Low Terrace and Alluvial Fan Deposits (Holocene)

- Exposed in the channel of Silver King Wash
- Alluvial deposits that have incipient soil development comprising sand to boulders





Photograph D. Alluvial deposits (Qy) in Silver King Wash

- Ql Moderately Dissected Alluvial Fan and Terrace Deposits (Late Pleistocene)
  - Exposed on the west side of Silver King Wash, along the southeast edge of the Happy Camp site
  - Alluvial deposits that have moderate soil development comprising sand to boulders

#### • Qm – Dissected Alluvial Fan and Terrace Deposits (Middle Pleistocene)

- Exposed on the east side of Silver King Wash, southeast of the Happy Camp site
- Alluvial deposits that have strong soil development comprising sand to boulders

#### • Qml – Middle Alluvium, Undifferentiated (Late to Middle Pleistocene)

- Composite unit that contains Ql and Qm exposed between the Happy Camp site and Queen Creek
- Alluvial deposits that have moderately to strongly developed soils

#### • Qo – Deeply Dissected Alluvial Fan Remnants (Early Pleistocene)

- Exposed in the Whitford Canyon watershed, between the Silver King and Whitford Canyon sites, near the junction of the Concentrator and Conley Spring Faults
- o Undifferentiated surficial deposits

#### • QTI – Landslide Deposits (Holocene or Pliocene)

- Exposed on the west slopes of Reavis Trail Canyon in the Whitford Canyon site
- Poorly consolidated to unconsolidated deposits comprising mud to large boulders



#### **Tertiary Sedimentary and Volcanic Rocks**

The Tertiary sedimentary and volcanic rocks occur chiefly in the Happy Camp site, and extend south to Queen Creek and east to the Concentrator Fault (**Figure 2**). These rocks likely have small hydraulic conductivity, except along bedding plans and steeply-dipping structural features where hydraulic conductivity may be substantially larger. Geologic units exposed at the Happy Camp site that are classified within the Tertiary sedimentary and volcanic rocks include:

#### • Tcu – Conglomerate (Miocene)

- Exposed throughout most of the Happy Camp main and cleaner tailings sites
- Moderately to well indurated conglomerate (Gila Conglomerate), consisting of sub-rounded to sub-angular cobbles to boulders; grades downward into Tsu



Photograph E. Joint in Tertiary Gila Conglomerate (Tcu) in Happy Camp Canyon

- Tsu Sandstone (Miocene)
  - o Exposed southeast and southwest of Happy Camp main site
  - o Medium to fine-grained sandstone; grades upward into Tcu; overlies Tb
- Tt Poorly Welded Tuff (Miocene)
  - Exposed in Happy Camp Canyon north of Happy Camp Spring
  - o Non-welded to poorly welded tuff of uncertain affinity





Photograph F. Tuffaceous volcanics (Tt) north of Happy Camp

- Tfp Felsic Lava Flows (Middle to Early Miocene)
  - Exposed in north part of Happy Camp cleaner tailings site
  - Quartz latite and rhyolite lava flows of the Picketpost Mountain volcanics





Photographs G and H. Felsic volcanics (Tfp) (left) and water pocket (right) Barnett Camp area



#### • Tb – Basaltic Rocks (Middle to Early Miocene)

- Exposed in south part of Happy Camp main site, in areas south of Happy Camp main and cleaner tailings sites, and along the Concentrator Fault in the Silver King site
- o Basalt lava flows and flow breccias

#### • Tal – Apache Leap Tuff (Early Miocene)

- Exposed near the northeast margin of Silver King Canyon site
- o Crystal-rich, ash-flow tuff, unwelded to densely welded

### • Tev – Volcanic Rocks (Early Miocene)

- Exposed near the northeast margin of Silver King Canyon site and the northeast margin of Whitford Canyon site
- Lava flows of rhyolite and perlitic obsidian

### • Tsl – Pre-Volcanic Sedimentary Rocks (Miocene to Late Oligocene)

- Exposed near the northeast margin of Silver King Canyon site
- Pre-volcanic clastic rocks (Whitetail Conglomerate) consisting of massive conglomerate, mudstone, evaporite, and sandstone

### **Tertiary and Cretaceous Intrusive Rocks**

A Tertiary granitoid stock occurs in the central part of the Whitford Canyon site, a Tertiary-Cretaceous porphyry intrusive occurs near the northeast edge of the Whitford Canyon site, and a Cretaceous quartz diorite stock occurs in the northeast part of the Silver King Canyon site (**Figure 2**). These rocks likely have small hydraulic conductivity. Geologic units exposed within Whitford Canyon and Silver King Canyon sites (**Figure 2**) that are classified within the Tertiary and Cretaceous intrusive rocks include:

- Tg2 Granitoid Stock of Wood Camp Canyon (Miocene)
  - Exposed in the center of the Whitford Canyon site
  - Fine-grained aplitic to granophyric granite
- TKpg Porphyry of Government Hill (Late Cretaceous or Paleocene)
  - Exposed near the northeast edge of the Whitford Canyon site
  - Quartz monzonite porphyry

### • Kqd – Quartz Diorite of Peachville Wash (Late Cretaceous)

- Exposed across the northeast part the Silver King Canyon site
- Medium to fine-grained quartz diorite, intrudes Pinal Schist, Apache Group and Paleozoic strata





Photograph I. Quartz diorite of Peachville Wash (Kqd)

#### Paleozoic Sedimentary Rocks

Paleozoic sedimentary rocks are exposed along the northeast margin of the Silver King Canyon site. The units are fractured and, thus, likely have small to moderate secondary hydraulic conductivity. The beds dip moderately to the east and southeast (**Figure 2 and 3**). Rocks exposed within the Silver King Canyon site that are classified within this group include:

- **Pn Naco Formation (Pennsylvanian)** 
  - Exposed along the east edge of the Silver King Canyon site adjacent to the Conley Spring Fault
  - o Fossiliferous fine-grained limestone interbedded with marl and shale
- MCs Undifferentiated Escabrosa Limestone, Martin Formation, and Bolsa Quartzite (Mississippian, Devonian, and Cambrian)
  - Exposed along the east edge of Silver King Canyon site
  - Consists of the following units: Escabrosa Limestone, Martin Formation, and Bolsa Quartzite; these units dip moderately to the east and southeast

#### Younger Precambrian (Middle Proterozoic) Sedimentary and Igneous Rocks

The younger Precambrian rocks are exposed in the northwest part of the Happy Camp main site and in the northeast and southeast parts of the Silver King site. The igneous unit likely has low hydraulic conductivity, whereas the sedimentary units are highly fractured



and, thus, likely have small to moderate secondary hydraulic conductivity. The beds dip moderately to the east and southeast (**Figure 2**). Rocks exposed within the Happy Camp and Silver King sites that are classified within this group include:

- Yd Diabase (Middle Proterozoic)
  - Exposed in the northwest part of the Happy Camp main site, and along the east part of Silver King Canyon site
  - Dark gray dikes with typical sub-ophitic, diabasic texture; major sills intrude Dripping Spring Quartzite, Mescal Limestone, Pioneer Shale, and Troy Quartzite
- Yad Apache Group, Troy Quartzite, and Diabase (Middle Proterozic):
  - Exposed in the northwest part of the Happy Camp main site
  - Consists of the following units: Diabase, Troy Quartzite, Mescal Limestone, Dripping Spring Quartzite, and Pioneer Shale; these units dip moderately to the east and southeast
- Ya Apache Group (Middle Proterozic):
  - Exposed between the Whitford and Happy Camp sites, and along the east part of Silver King Canyon watershed
  - Consists of the following units: Mescal Limestone, Dripping Spring Quartzite, and Pioneer Shale; these units dip moderately to the east and southeast



Photograph J. Contacts between Precambrian diabase (left), Apache Group (center), and Paleozoic units (right)



#### Older Precambrian (Early Proterozic) Igneous and Metamorphic Rocks

The older Precambrian rocks are exposed throughout the Whitford site and in the west part of the Silver King site. The hydraulic conductivity of these rocks is likely very small and mainly controlled through secondary structural features (Figure 2). Rocks that are classified within this group include:

- Xgd Granodiorite to Granite (Early Proterozoic)
  - o Exposed in the northwestern part of the Whitford Canyon site

#### • Xp – Pinal Schist (Early Proterozoic)

- Exposed in most of the Whitford Canyon site and in the west part of the Silver King Canyon site
- Generally consists of fine-grained quartz-muscovite-chlorite ± biotite semischist to phyllite
- Xpc Pinal Schist Calc-silicate and Amphibolite Facies (Early Proterozoic):
  - Exposed in a small area in the south part of the Whitford Canyon site
  - o Consists of interlayered amphibolite, marble, and psammite

#### • Xpp – Pinal Schist Phyllite Facies (Early Proterozoic):

- o Exposed near Queen Creek south of the Happy Camp cleaner tailings site
- Consists of massive, platy, slightly schistose phyllite



Photograph K. Pinal Schist (Xp)



#### HYDRAULIC CONDUCTIVITY OF PRINCIPAL GEOLOGIC UNITS

Hydraulic conductivity for geologic units in the project area has been estimated from hydrologic tests at wells in the study area; estimated hydraulic conductivity values are summarized in **Table 3**.

Hydraulic conductivity for the Gila Conglomerate (Tcu) was has been estimated based on 14 hydrologic tests conducted at monitor wells in the West Plant area. Estimates of hydraulic conductivity of the conglomerate (excluding one test for a mudstone unit within the conglomerate), range from  $1.1 \times 10^{-7}$  to  $6 \times 10^{-9}$  centimeters per second (cm/sec); arithmetic mean is  $3.0 \times 10^{-6}$  cm/sec and geometric mean is  $4.8 \times 10^{-7}$  cm/sec. Estimated hydraulic conductivity of the mudstone unit (one test) within the Gila Conglomerate is  $1.3 \times 10^{-9}$  cm/sec.

Hydraulic conductivity for the mid- to early-Miocene Tertiary Picketpost Mountain volcanic units was estimated to be  $1 \times 10^{-5}$  cm/sec based on a constant-rate pumping test at well DHRES-04.

Hydraulic conductivity for the Apache Leap Tuff (Tal) has been estimated based on 22 hydrologic tests at the HRES series of wells. Estimated hydraulic conductivity ranges from 2 x  $10^{-7}$  to 6 x  $10^{-3}$  cm/sec; arithmetic mean is 5 x  $10^{-4}$  cm/sec and geometric mean is 5 x  $10^{-5}$  cm/sec.

Hydraulic conductivity for younger Precambrian sedimentary rocks and diabase (Yad) was estimated to be 4 x  $10^{-6}$  cm/sec based on a constant-rate pumping test at well DHRES-09. A pumping test at well DHRES-13, which penetrates the same rock units and also Pinal Schist (Xpc), indicated a similar hydraulic conductivity of 1 x  $10^{-6}$  cm/sec.

#### OCCURRENCE AND MOVEMENT OF GROUNDWATER

Groundwater level measurements for the study area were obtained from ADWR databases, including the GWSI database, and the 55 and 35 well registries. Measurements from the GWSI are obtained by ADWR for index wells, and are considered reliable. Measurements from the 55 and 35 well registries are often reported by the driller or pump contractor at the time of drilling or equipping of the well, are considered less reliable than measurements from the GWSI, and also may not be representative of current or recent groundwater conditions. A groundwater level monitoring round was conducted by RCM personnel in August 2012 as part of the Superior basin and Queen Creek corridor study. These groundwater level measurements are shown on **Figure 5**. **Figure 5** shows groundwater level elevation contours based on the best available data for shallow groundwater system in the Superior basin. Inspection of **Figure 5** indicates that groundwater beneath the Silver King and Happy Camp areas moves generally from northeast to southwest. Average hydraulic gradient is in the magnitude of 20 meters per kilometer.





There is one registered well in the Whitford Canyon watershed and one registered well in the Bear Tank Canyon watershed. During the site visit on August 10, 2012, the Cottonwood Well [(D-1-12)16db] in Whitford Canyon watershed was inspected (**Photograph L**) (**Figure 2**). Groundwater level was measured at 10.9 meters bls; temperature of the groundwater was 34.0 degrees Celsius ( $^{\circ}$ C), pH was 7.68, and specific conductance was 2,211 µS/cm. The Noble Well [(D-1-12) 19cb] in Bear Tank Canyon watershed was not visited.



Photograph L. Cottonwood Well and tank

During the August 10, 2012 site visit, an unregistered well was located near the head of Wood Camp Canyon adjacent to a stone cabin (**Photograph M**). The well is a former windmill well, that was 5 feet in diameter and about 15 feet deep. It is located in Township 1 North, Range 12 East, in the SE <sup>1</sup>/<sub>4</sub>, of the SE <sup>1</sup>/<sub>4</sub>, of the NW <sup>1</sup>/<sub>4</sub> of Section33. The presence of drill cuttings on the ground suggests that the well was recently deepened. An 8-inch casing is installed in the well.



Photograph M. Stone cabin and well





Within the Whitford Canyon watershed, there is one reported spring. Black Spring is reported to be located just south of the drainage divide near the head of Reavis Trail Canyon in the NW 1/4 of Section 29, Township 1 North, Range 12 East, at an elevation of about 1,347 meters amsl. While the spring was not visited in August 2012, Google Earth images for the area show a stand of vegetation that may mark the location for the spring. The groundwater supplying this reported spring may be part of local perched aquifer system dependent on recent local rainfall and is not believed to be part of the regional aquifer system. Perlite Spring is located north of the Happy Camp cleaner tailings site (**Figure 1**). There are two reported springs in the Bear Tank Canyon watershed, Perlite Spring and an unnamed spring. The springs in Bear Tank Canyon watershed were not visited during the August 2012 field reconnaissance.

There are five registered wells in the Silver King, Happy Camp, and Rice Water Canyon watersheds. Construction details are available for one domestic well, two industrial wells, and one stock well. Reported depths for these wells range from 12 to 122 meters bls, and reported groundwater levels range from 7.6 to 39.6 meters bls (**Appendix C**). The Silver King Well [(D-1-12)27aad] was inspected on August 10, 2012. The windmill is operational and supplies a trough and stock pond (**Photograph N**). Depth to groundwater level was measured at 9.3 meters bls; temperature of the groundwater was  $26.4^{\circ}$ C, pH was 7.04, and specific conductance was  $1,214 \mu$ S/cm. The Rice Well [(D-1-12)31dd] is reportedly located in Rice Water Canyon but was not visited during the August 2012 reconnaissance. RCM personnel report a depth to groundwater level of 16.7 m, and a groundwater level elevation of 739.4 meters amsl, at the Rice Well (August 2012).





Photograph N. Silver King Well and stock pond

Within the Silver King and Happy Camp watersheds, there are four reported spring locations. The springs include Happy Camp Spring, Bitter Spring, I-Berry Spring, and Conley Spring. Happy Camp Spring is located on the floor of Happy Camp Canyon, within the Gila Conglomerate (Tcu) (**Figure 2**). During the site visit on August 10, 2012, the spring area consisted of a dammed section of a stream channel with sediment built up behind the dam (**Photograph O**). A discharge pipe extends from behind the dam to a stock pond located downstream. Discharge to the pond was estimated to be about 0.3 liters per second; temperature was  $27.5^{\circ}$ C, pH was 6.73, and specific conductance was 790 µS/cm.



Photograph O. Dam in wash at Happy Camp Spring





Bitter Spring is an improved spring located in the Fortuna Wash drainage, within the Kqd about 30 meters downstream from the contact between the Kqd and Xp (**Figure 2**). The site was visited on August 9, 2012. The spring is developed with a spring box, a solar powered submersible electric pump, storage tank, and cattle trough (**Photograph P**). Depth to groundwater level at the spring box was 2.7 meters bls. Water quality parameters were measured from the cattle trough; temperature was  $31.3^{\circ}$ C, pH was 8.32, and specific conductance was  $1,327 \mu$ S/cm.



Photograph P. Bitter Spring

In Conley Spring Wash, a spring zone was observed. Within the spring zone there were travertine-cemented cobbles of Apache Leap Tuff, limestone, diabase, basalt, and quartzite. The spring was dry, but the presence of riparian vegetation including cattails, tobacco tree, pentstemon, hackberry, and a small dead cottonwood tree suggests that at times there is flow or seepage in the zone (**Photograph Q**).





Photograph Q. Conley Spring with riparian vegetation (left) and travertine cemented cobbles in spring zone (right)

I-Berry Spring is an improved spring located in the Peachville Wash drainage within the Kqd. RCM personnel reported a depth to groundwater level of 5.3 meters bls in August 2012. The groundwater supplying this reported spring may be part of local perched aquifer system dependent on recent local rainfall and is not believed to be part of the regional aquifer system.

The presence of Happy Camp, Bitter, and I-Berry Springs and the shallow water levels (about 10 meters bls) in Cottonwood and Silver King Wells indicate that groundwater level occurs at small depths beneath the canyon floor, and possibly at depths of several tens of meters beneath the canyon sides. The Paleozoic and younger Precambrian sedimentary rocks likely contain a persistent but highly compartmentalized groundwater system due to the faulting and juxtaposition of sedimentary rocks, diabase and schist. Regional direction of groundwater movement for this system is believed to be generally from northeast to southwest (**Figure 5**).

Groundwater level data and results of calibration of the RCM integrated groundwater flow model suggest that the Concentrator Fault acts as a barrier to groundwater movement. Comparison of water level elevations in deep wells east of the Concentrator Fault to water level elevations in wells completed to similar depths west of the fault suggests the fault acts as a barrier to groundwater movement. To calibrate the RCM integrated groundwater flow model, horizontal hydraulic conductivity assigned to rock units along the Concentrator Fault were reduced by two orders of magnitude compared to conductivities assigned to the same rock units outside the fault zone (Schlumberger Water Services, 2010). Vertical hydraulic conductivity was not reduced in the flow model.





The deep groundwater system is believed to highly compartmentalized. Due to dewatering operations, water levels in the mine workings within the RCM graben are about 500 meters bmsl. Water levels in wells outside the RCM graben are several thousand meters higher.

#### **GROUNDWATER USES**

Information on groundwater uses in the study area was obtained from the ADWR GWSI database and 55-Well Registry. The majority of groundwater uses are reported to be stock uses for most wells in the region surrounding Whitford Canyon and Silver King Canyon watersheds. Monitoring, industrial, or domestic uses are reported for a smaller percentage of wells in the study area (Figure 1; Appendices B through D).

Most of the wells in the study area are classified as "exempt" wells, which are equipped to pump less than 35 gallons per minute, and are exempt from the requirement to report groundwater withdrawals to ADWR. There are no reported groundwater withdrawals within Whitford Canyon, Silver King Canyon, or Bear Tank Canyon watersheds. Reported groundwater withdrawals for non-exempt wells in the wider study area are summarized in **Table 1** for the period 1993 through 2010. The reported groundwater withdrawals and well owners include:

•	(D-1-12)36bbc (D-1-13)17dcb	Resolution Copper Mining LLC Shaft No. 3 Integrity Land & Cattle, LLC
٠	(D-1-13)32bbd (D-2-11)01cdc	Resolution Copper Mining LLC Shaft No. 9 Frank Herron
•	(D-2-11)01dcd (D-2-12) 07aba	Boyce Thompson Southwest Arboretum Boyce Thompson Southwest Arboretum
•	(D-2-12)08daa	Harborlite Corporation
•	(D-2-12)10ba	Harry & Helen Smith Trustees

The largest volumes of groundwater withdrawals have been from the wells owned RCM and Integrity Land & Cattle, LLC. The RCM withdrawals are for dewatering at Shaft No. 3 and Shaft No. 9. The well owned by Integrity Land & Cattle, LLC has not been pumped since 2002.

#### ASSESSMENT OF POTENTIAL FOR MIGRATION OF TAILINGS WATER

Hydrogeologic data compiled for the present investigation were used to assess the potential for migration of tailings water in geologic units beneath potential tailings impoundments. The potential for migration will be controlled by hydraulic conductivity of the underlying rock units and by hydraulic gradients that will act as the driving force to move tailings water into and through geologic units



The only geologic units in the study area with large hydraulic conductivity are the Quaternary alluvial and colluvial deposits. For all other geologic units, hydraulic conductivity is related chiefly to degree and interconnection of fractures associated with structural features. For the volcanic rocks in the north and south parts of the Happy Camp main site and the north part of the Happy Camp cleaner tailings site, hydraulic conductivity may also be related to the nature and spacing of bedding planes between volcanic units.

Hydraulic gradients will depend partly on depth to groundwater level, which ranges from a few meters or less in the topographically low areas to several tens of meters beneath the sides of the canyons. Vertical hydraulic gradients acting to move tailings water downward into underlying geologic units would be smaller beneath the floors of canyons than beneath the sides of canyons.

The largest potential for migration of tailings water is along the canyon floor at the south end of the Silver King site, where tailings would directly overlie Quaternary alluvium. Substantial seepage could also occur in Tertiary volcanic rocks in the north and south parts of the Happy Camp main site and in the northeast part of the Happy Camp cleaner tailings site. These rocks may contain bedding planes and structural features that would correspond to zones of enhanced hydraulic conductivity. During the later stages of tailings deposition in the Silver King site, substantial seepage could also occur along the eastern edge of the Silver King Canyon site, where tailings would directly overlie Paleozoic sedimentary rocks that may locally have enhanced hydraulic conductivity along bedding planes, and along possible fractures and solution features.

Moderate potential for migration of tailings water is associated with the younger Precambrian sedimentary rocks in the north part of the Happy Camp site and south part of the Silver King site, where fracture zones may occur resulting in locally enhanced hydraulic conductivity. Although the Concentrator Fault appears to act as a barrier to groundwater movement in the deeper flow system in the vicinity of Superior, it is possible that this fault and the Main and Conley Spring Faults, which pass through the south part of the Silver King site, may have resulted in local zones of fracturing and enhanced hydraulic conductivity.



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#### TABLE 1. SUMMARY OF GROUNDWATER WITHDRAWALS NEAR WEST TAILINGS PREFEASIBILITY STUDY RESOLUTION COPPER MINING, PINAL COUNTY, ARIZONA

	55 WELL			ANNUAL GROUNDWATER WITHDRAWALS (acre-feet)																	
CADASTRAL LOCATION	REGISTRY NUMBER	OWNER/COMPANY	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
(D-01-12) 36bbc	525311	Resolution Copper Mining LLC	374	228.5	116.2	213	4.1	435.81											878.8	1047	Shaft No. 3
(D-01-13) 17dcb	609674	Integrity Land & Cattle, LLC	2084.58	1433.71	1119.96	1604.2	1193	1208.7	1304	1479	1259	1791									
(D-01-13) 32bbd	525312	Resolution Copper Mining LLC	781	569.7	863.3	590.8	713.4		29.72	50.73	20.46	41.22	16.92	25.9	0	50.15	58.58	64.13	883.2	1040	Shaft No. 9
(D-02-11) 01cdc	627522	Frank Herron	3	6.5	1.3	3.9	6.96	6.22	1.9	2.5	11							6.04	9.71	8.915	
(D-02-11) 01dcd	560518	Boyce Thompson Southwest Arboretum						31	17.6	40.2	21.7	41	31.3	28.3	30	12.8	16.9	30.8	53	31.8	
(D-02-12) 07aba	624605	Boyce Thompson Southwest Arboretum		43.1	44.5	47	56.5	37.19	48.7	34.77	37	24.3	37.3	30.5	40	46.4	29.7	36.6	34.8	23	
(D-02-12) 08daa	588114	Harborlite Corporation									103.4		76.1				91.4	116.2	95.7	273.8	
(D-02-12) 10ba	602821	Harry & Helen Smith Trustees	12	11	10	11	12	14	15	17	19	18	12	14	13	14	24	7	6	9.9	

--- = No groundwater withdrawals reported



#### TABLE 2. SUMMARY OF BOREHOLE LITHOLOGIC LOGS NEAR WEST TAILINGS PREFEASIBILITY STUDY RESOLUTION COPPER MINING, PINAL COUNTY, ARIZONA

					GEOLOG	IC DATA FROM KENNECOTT		
	55 WELL	INTE	RVAL			DRILLER NOTES FROM		
	CADACTDAL	REGISTRY	TOP	BOTTOM				
BOREHOLE IDENTIFIER	CADASTRAL LOCATION	NUMBER	(m, bls) <sup>a</sup>	(m, bls)	GEOLOGIC AGE	GEOLOGIC UNIT	ADWR IMAGED WELL RECORDS	
IDENTIFIER	LOCATION	NOWBER	0.0		Tertiary	Volcanic Rocks	RECORDS	
			264.3		Tertiary	Apache Leap Tuff		
			290.2		Tertiary	Whitetail Conglomerate	—	
			364.2		Precambrian	Diabase	Minor water at 20 meters	
AC-1	(D-02-12)08bca	546429	373.7		Precambrian	Quartzite	below land surface	
	( - ,		375.8		Precambrian	Diabase		
			398.7	406.3	Precambrian	Quartzite	Artesian flow at 384 meters	
			406.3		Tertiary	Volcanic Rocks / Dike (?)		
			408.4		Precambrian	Diabase		
			0.0	540.7	Tertiary	Volcanic Rocks		
			540.7	670.6	Tertiary	Apache Leap Tuff	Minor water at 67 meters	
AC-2	(D-02-12)08ddd	546429	670.6	831.2	Tertiary	Whitetail Conglomerate	below land surface	
			831.2	929.3	Precambrian	Sedimentary Rocks		
			929.3	988.5	Precambrian	Quartzite		
	(D-02-12)05cda		0.0		Quaternary-Tertiary	Alluvial Sediments and Volcanic Rocks		
AC-3		553490	553490	341.7		Tertiary	Apache Leap Tuff	Depth to water at 24 meters
7.0 0		000100	396.2		Tertiary	Whitetail Conglomerate	below land surface	
			484.8	691.3	Precambrian	Diabase		
					<b>.</b> . <b>.</b>			
				0.0 500.5		Quaternary-Tertiary Tertiary	Alluvial Sediments, Gila Conglomerate, and Volcanic Rocks Apache Leap Tuff	
					,			
			648.6		Tertiary	Whitetail Conglomerate		
			666.0		Precambrian	Troy Quartzite and Diabase		
			671.2 681.5		Precambrian Precambrian	Diabase Sedimentary Rocks		
			821.1		Precambrian	Quartzite		
			902.2		Precambrian	Diabase		
			902.2		Precambrian	Quartzite		
			921.4		Precambrian	Diabase		
			931.0		Precambrian	Quartzite		
			980.9		Precambrian	Diabase		
AC-4	(D-02-12)08aaa	552443	996.7		Precambrian	Quartzite	Artesian flow at 854 meters	
			1012.2		Precambrian	Diabase		
			1048.8		Precambrian	Quartzite		
			1068.3	1074.4		Breccia		
			1074.4		Precambrian	Quartzite		
			1079.9	1092.7		Breccia		
			1092.7		Precambrian	Quartzite		
			1124.4	1130.8		Breccia		
			1130.8	1188.7	Precambrian	Quartzite		
			1188.7	1211.6	Precambrian	Diabase		
			1211.6	1214.6		Breccia		
			1214.6	1225.6	Precambrian	Diabase		





# TABLE 2. SUMMARY OF BOREHOLE LITHOLOGIC LOGSNEAR WEST TAILINGS PREFEASIBILITY STUDYRESOLUTION COPPER MINING, PINAL COUNTY, ARIZONA

					GEOLOG	IC DATA FROM KENNECOTT		
			INTE	RVAL				
	0 4 D 4 0 T D 4 1	55 WELL	TOP	BOTTOM			DRILLER NOTES FROM	
BOREHOLE IDENTIFIER	CADASTRAL LOCATION	REGISTRY NUMBER	(m, bls) <sup>a</sup>	(m, bls)	GEOLOGIC AGE	GEOLOGIC UNIT	ADWR IMAGED WELL RECORDS	
			0.0	409.7	Tertiary	Volcanic Rocks		
		552444	409.7		Precambrian	Diabase	Depth to water at 24 meters	
AC-5	(D-02-12)06daa		524.0		Precambrian	Quartzite	below land surface	
			604.4		Precambrian	Diabase		
			0.0	428.2	Quaternary-Tertiary	Alluvial Sediments, Gila Conglomerate, and Volcanic Rocks		
10.0	(D 00 40)05-h-	550440	428.2	531.0	Precambrian	Sedimentary Rocks	Depth to water at 30 meters	
AC-6	(D-02-12)05abc	552442	531.0	554.4	Cretaceous (Tertiary?)	Quartz Eye Porphyry	below land surface	
			554.4	621.8	Precambrian	Diabase		
			0.00		Tertiary	Gila Conglomerate with Interbedded Sandstone and Volcanic Rocks		
			438.91		Tertiary	Apache Leap Tuff		
			632.46		Tertiary	Whitetail Conglomerate		
B-1	(D-01-12)33		765.05		Precambrian	Dripping Spring Quartzite		
			798.58		Precambrian	Diabase		
			1005.84		Precambrian	Dripping Spring Quartzite		
			1072.90	1434.69	Precambrian	Diabase		
			0.00		Tertiary	Gila Conglomerate with Interbedded Volcanic Rocks		
			932.69		Tertiary	Apache Leap Tuff		
			1216.15		Tertiary	Whitetail Conglomerate		
				1224.08		Devonian	Martin Formation	
			1258.82		Cambrian	Bolsa Quartzite		
				1295.40		Precambrian	Troy Quartzite	
B-2	(D-01-12)34b		1344.17		Precambrian	Mescal Limestone		
			1447.80		Precambrian	Dripping Spring Quartzite		
			1493.52		Laramide	Quartz eye porphyry		
			1508.76		Precambrian	Dripping Spring Quartzite	-	
			1514.86		Precambrian	Diabase	-	
			1682.50		Precambrian	Dripping Spring Quartzite	-	
			1700.78	1810.51	Precambrian	Diabase		
			0.0	100 4	Tertiary	Volcanic Rocks		
			188.1		Tertiary	Apache Leap Tuff	4	
			257.9		Tertiary	Whitetail Conglomerate	4	
B-6	(D-02-12)06abd		323.4		Precambrian	Diabase	1	
D-0	(D-02-12)00a00		473.1	-	Precambrian	Dripping Spring Quartzite	1	
			473.1		Precambrian	Diabase	1	
			490.4 520.0		Precambrian	Dripping Spring Quartzite	-	
			520.0	011.1				
			0.00	559 61	Tertiary	Gila Conglomerate with Interbedded Volcanic Rocks		
			559.61		Tertiary	Apache Leap Tuff	1	
			822.66		Precambrian	Diabase	1	
B-7	(D-01-12)33d		947.01		Precambrian	Basalt	1	
- •	()000		971.70		Precambrian	Mescal Limestone	1	
			1089.66		Precambrian	Dripping Spring Quartzite	1	
			1171.35		Precambrian	Diabase	1	

<sup>a</sup> m, bls = meters below land surface

--- = not available



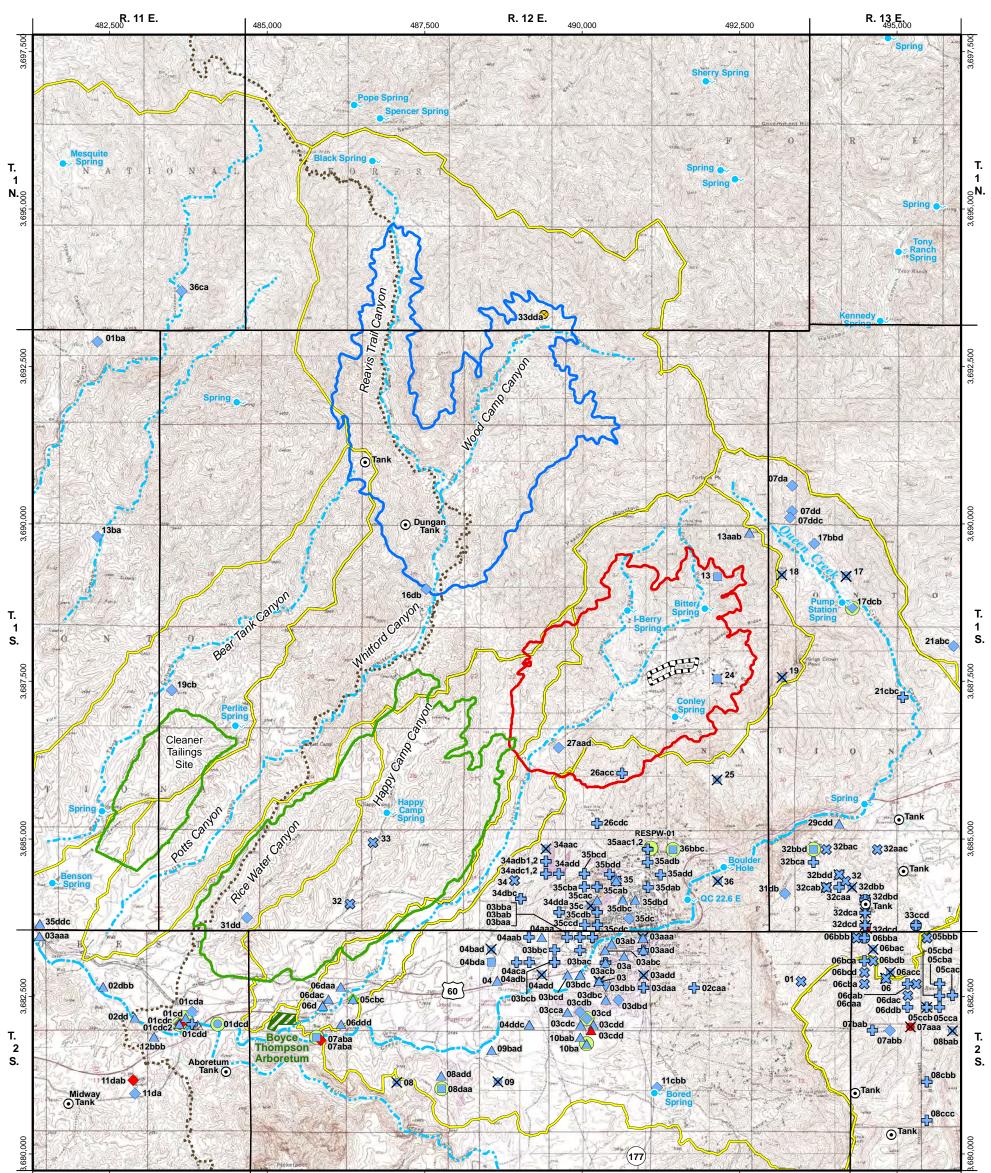


#### TABLE 3. SUMMARY OF REPORTED HYDRAULIC CONDUCTIVITY VALUES FOR GEOLOGIC UNITS NEAR WEST TAILINGS PREFEASIBILITY STUDY **RESOLUTION COPPER MINING, PINAL COUNTY, ARIZONA**

WELL(S)	HYDRAULIC CONDUCTIVITY (cm/sec) <sup>a</sup>	TEST TYPE	GEOLOGIC UNIT TESTED	SOURCE(S)
Smelter Pond POC	3.4 x 10 <sup>-5</sup>		Alluvium	Golder & Assoc., 2008
MCC-1	3.8 x 10 <sup>-7</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
MCC-2	1.1 x 10 <sup>-7</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
MCC-3B	1.3 x 10 <sup>-9</sup>		Mudstone	Golder & Assoc., 2008
MCC-3C	6.2 x 10 <sup>-7</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
MCC-4	2.2 x 10 <sup>-7</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
MCC-6A	1.7 x 10 <sup>-7</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
MCC-6B	9.9 x 10 <sup>-8</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
MCC-6C	7.1 x 10 <sup>-7</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
MCC-9	1.1 x 10 <sup>-5</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
GAI-02-01	1.4 x 10 <sup>-6</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
GAI-02-02	2.3 x 10 <sup>-5</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
Settling Ponds 1, 2	1.1 x 10 <sup>-6</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
Tailings Pond 5 POC	4.5 x 10 <sup>-7</sup>		Gila Conglomerate (Tcu)	Golder & Assoc., 2008
DHRES-05	6 x 10 <sup>-9</sup>	Falling-head slug	Gila Conglomerate (Tcu)	M&A, 2011a
DHRES-04	1 x 10 <sup>-5</sup>	Constant-rate pumping	Tertiary Picketpost Mountain volcanic units	M&A, 2011a
HRES series <sup>b</sup>	Range: $2 \times 10^{-7}$ to $6 \times 10^{-3}$ Arithmetic Mean: $5 \times 10^{-4}$ Geometric Mean: $5 \times 10^{-5}$	Constant-rate pumping tests (18), falling-head slug tests (2), and airlift tests (2)	Apache Leap Tuff (Tal)	M&A, 2005, 2008, 2010, 2011a, 2011b, 2011c, 2012a, 2012b
DHRES-09	4 x 10 <sup>-6</sup>	Constant-rate pumping	Younger Precambrian sedimentary rocks and diabase (Yad)	M&A, 2011d
DHRES-13	1 x 10 <sup>-6</sup>	Constant-rate pumping	Younger Precambrian sedimentary rocks and diabase (Yad), and Older Precambrian Pinal Schist (Xpc)	M&A, 2011e

<sup>a</sup> cm/sec = centimeters per second <sup>b</sup> HRES Series: HRES-01 through HRES-07, HRES-09 through HRES-13, Oak Flat well, and wells A-06 and MJ-11







485,000

487,500

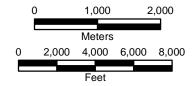
Watershed Boundary



492,500

<sup>495,000</sup> **R. 13 E.** 

# DRAFT





# **EXPLANATION**

<sup>10aac</sup> ● Well Location and Identifier

#### Source of Well Data (by color)

- ADWR GWSI Database
- ADWR 55 Well Registry
- ADWR 35 Well Registry
   Unregistered Well Located During Field Reconnaissance

#### Water Uses (by symbol)

- Recreation
- ▲ Domestic
- Commercial or Industrial
- Irrigation or Stock
- Monitoring, Test, or Remediation
- \* Mineral Exploration
- ▼ Production
- X Undetermined or Unused



----- Stream

Arizona Trail

Spring

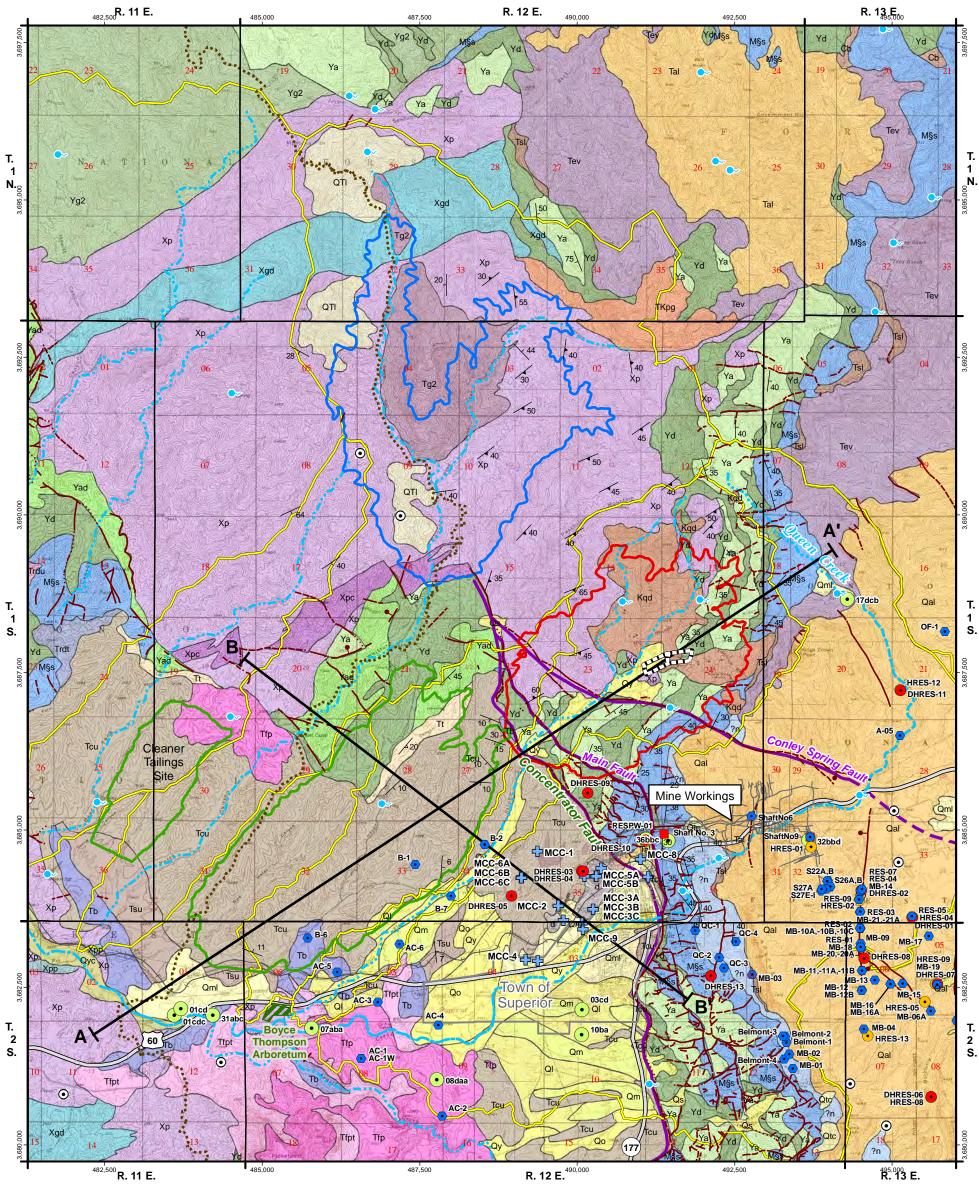
 $( \bullet )$ 

Stock Tank

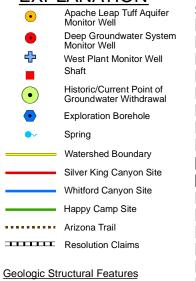
Historic/Current Point of Groundwater Withdrawal

- Silver King Canyon Site
- Whitford Canyon Site
- Happy Camp Site

#### Resolution Claims



## **EXPLANATION**



- ---- Fault; dashed where approximately located; dotted where concealed. Bar and Ball on Downthrown Side. 40 Strike and Dip of Beds
- 30
- Strike and Dip of Metamorphic Foliation 15 Strike and Dip of Igneous Foliation

#### Geologic Units

- d-Holocene Disturbed Surficial Deposits Qyc- Holocene Active Alluvium Qtc-Holocene & Pleistocene Tallus & Colluvium
- Qy-Holocene Low Terrace & Alluvial Fan Deposits
- Qml-Late Pleistocene to Middle Pleistocene Alluvium Undifferentiated
- Qm-Mid Pleistocene Dissected Alluvial Fan & Terrace Deposits
- QI-Late Pleistocene Moderately Dissected Alluvial Fan & Terrace Deposits
- Qo-Early Pleistocene Deeply Dissected Alluvium Undifferentiated
- Qs-Quaternary Surficial Deposits
- Qtc-Holocene & PleistoceneTalus & Colluvium
- Qal-Quaternary Alluvium
- QTI-Holocene or Pliocene Landslide Deposits
- Tcu-Miocene Conglomerate
- Tsu-Miocene Sandstone
- Tt-Miocene Tuff (poorly welded)
- Tfp-Mid Miocene to Early Miocene Felsic Lava Flows Picketpost Mountain
- Tfpt-Mid Miocene to Early Miocene Tuffs Picketpost Mountain
- Tb-Mid Miocene to Early Miocene Basalt Picket Post Mountain
- Tg2-Miocene Granitoid Stock of Wood Camp Canyon
  - Location of Hydrogeologic Section

Trdu-Middle Miocene Undifferentiated Felsic Lava Tal-Early Miocene Apache Leap Tuff Trdt-Early Miocene Undifferentiated Felsic Tuffs Tev-Early Miocene Volcanic Rocks TsI-Miocene to Late Oligocene Clastic Rocks TKpg-Late Cretaceous or Paleocene Porphyry of Government HIII Kqd-Late Cretaceous Quartz Diorite of Peachville Wash

?n-Naco Formation

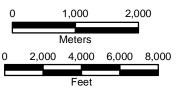
M§s-Mississipian/Devonian/Cambrian Undifferentiated Escabrosa, Martin & Bolsa

Cb-Bolsa Quartzite

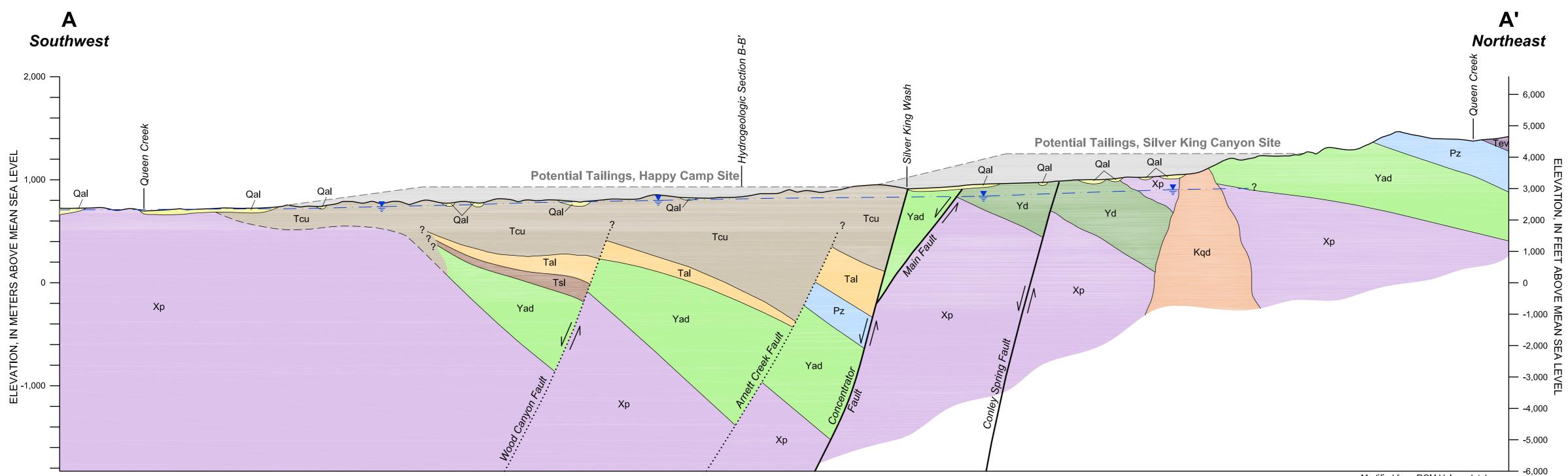
- Yad-Mid Proterozoic Apache Group, Troy Quartzite & Diabase
- Yd-Mid Proterozoic Diabase
- Ya-Mid Proterozoic Apache Group
- Yg2-Mid Proterozoic Porphyritic Biotite Granite
- Xgd-Early Proterozoic Granodiorite to Granite
- Xp-Early Proterozoic Pinal Schist
- Xpc-Pinal Schist Calc Silicate & Amphibolite Facies
- Xpp-Pinal Schist Phyllite Facies

(Geology from Spencer and others, 1998; Faults from Peterson, 1969, and Spencer and Richard, 1995)

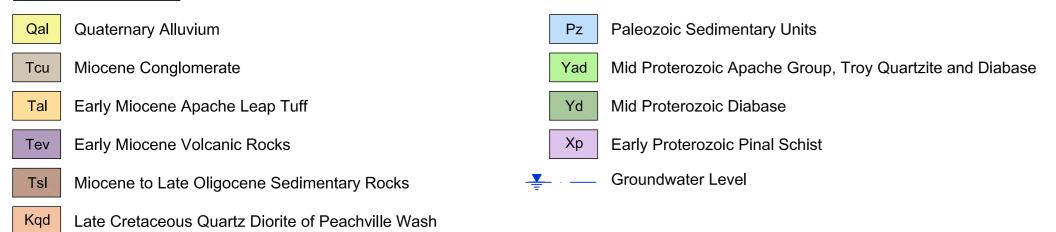


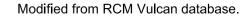


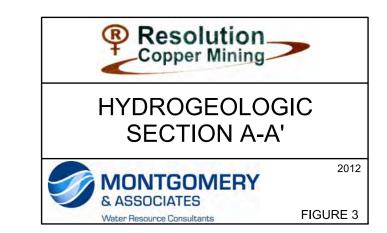




# EXPLANATION







DRAFT

800

1,000 2,000 3,000 4,000

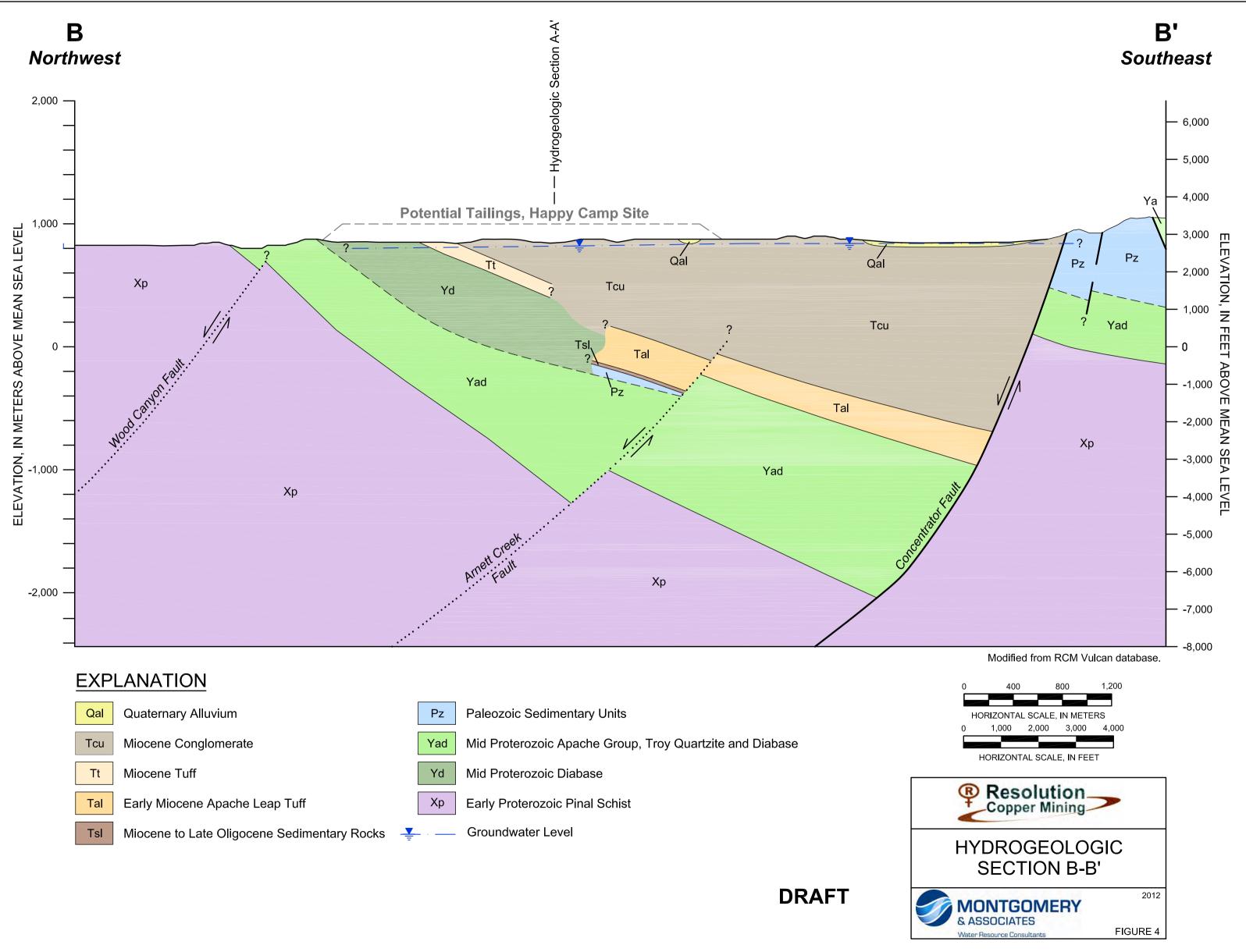
HORIZONTAL SCALE, IN METERS

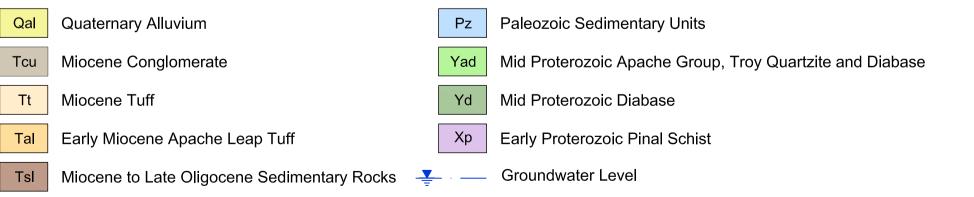
HORIZONTAL SCALE, IN FEET

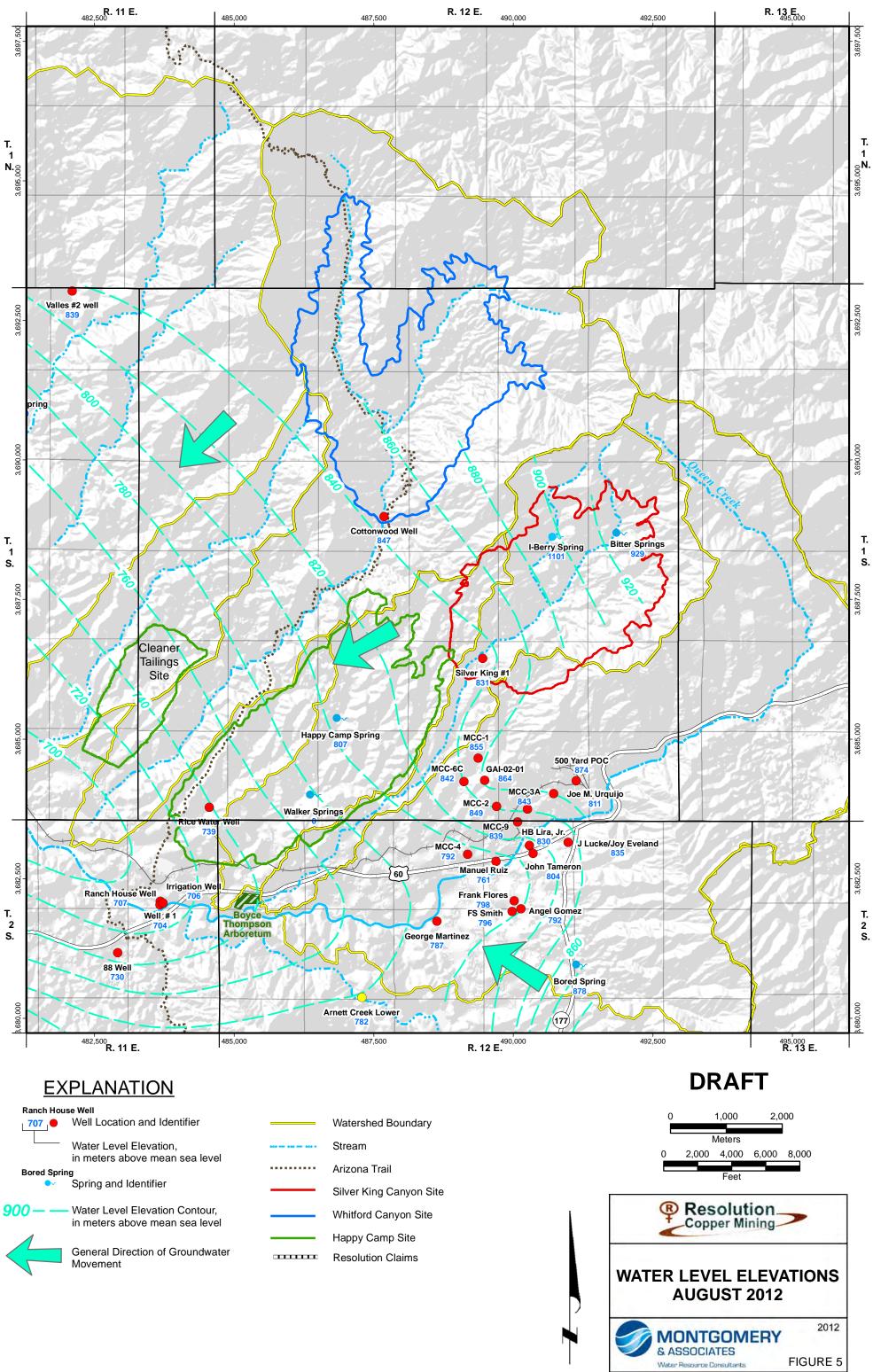
400

1,200













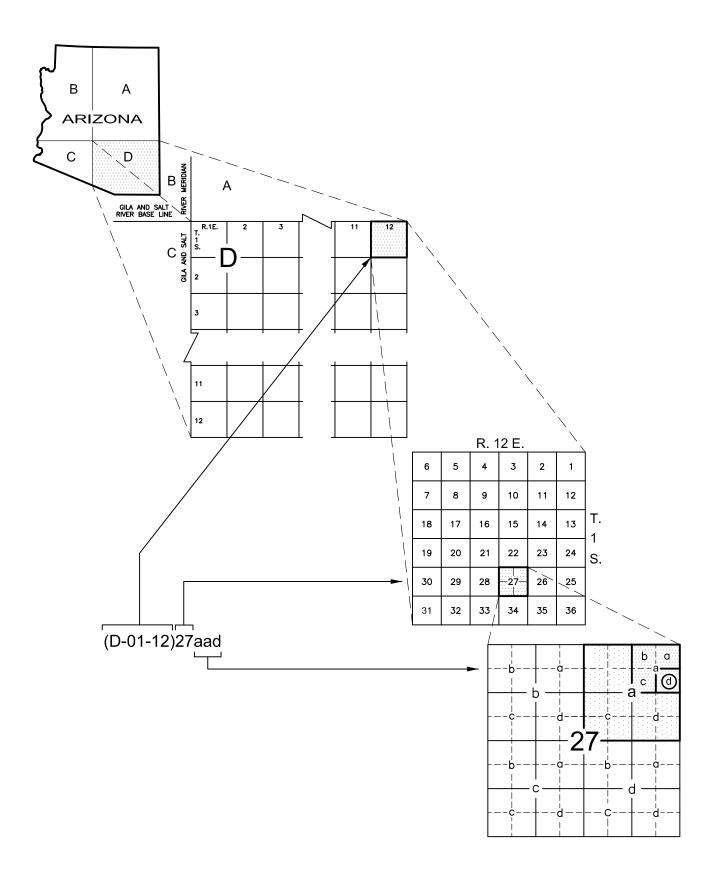
**APPENDIX A** 

WELL NUMBERING SYSTEM



#### WELL NUMBERING SYSTEM

The well numbers used in this study are in accordance with the Bureau of Land Management's system of land subdivision. The land survey in Arizona is based on the Gila and Salt River meridian and base line, which divide the State into four quadrants. These quadrants are designated, counter-clockwise, by the capital letters A, B, C, and D. All land north and east of the point of origin is in quadrant A; all land north and west of the point of origin is in quadrant B; all land south and west is in quadrant C; and land all land south and east is in quadrant D. The first digit of a well number indicates the township, the second digit the range, the third digit the section in which the well is located. The lowercase letters a, b, c, and d after the section number indicate the well location within the section. The first letter denotes the 160-acre tract or quarter section; the second 40-acre tract or quarter-quarter section; the third letter denotes the 10-acre tract or quarter-quarter-quarter section. These letters are also assigned in a counter-clockwise direction, beginning in the northeast quarter. As Figure A-1 shows, well number (D-01-12) 27aad designates the well as being in the Southeast 1/4 of the Northeast 1/4 of the Northeast 1/4, Section 27, Township 1 South, Range 12 East. Where more than one well is within a 10-acre tract, consecutive numbers, beginning with "1" are added as suffixes.



# FIGURE A-1. WELL NUMBERING DIAGRAM



**APPENDIX B** 

# SUMMARY OF WELL RECORDS FROM ADWR 35-WELL REGISTRY

							CASING				NON-PUMP	ING WATER LEV	′EL				
CADASTRAL LOCATION	ADWR WELL REGISTRY NUMBER	OWNER	DATE COMPLETED	DEPTH DRILLED (ft, bls) <sup>a</sup>	DIAMETER (inches)	DEPTH (feet)	MATERIAL	PERFORATED INTERVAL (ft, bls)	ALTITUDE OF LAND SURFACE (ft, msl) <sup>C</sup>	DEPTH (ft, bls)	DEPTH (m, bls) <sup>d</sup>	DATE MEASURED	ALTITUDE (ft, msl)	PUMPING RATE (gpm) <sup>e</sup>	WATER USE <sup>f</sup>	LOGS <sup>g</sup>	REMARKS
(D-01-11) 35abc	67972	MARTIN, W H	1/1/1950	110	8	0-110	z			40	12.2	1/1/1950		15	D	D	
(D-02-12) 03aad	74432	VINDIOLA, JOE M	3/20/1979	117	4	0-117	В	100-117							D	D	
(D-02-12) 05cbc	78468	AZ BRD OF REGENTS	11/1/1963	120	8 6	0-87 87-120	Р			45	13.7	11/1/1963		21	I	D	

#### <sup>a</sup> ft, bls = feet below land surface

<sup>b</sup> Casing Material:

B = Plastic or PVC

P = Steel

Z = Other

<sup>d</sup> m, bls = meters below land surface

<sup>c</sup> ft, msl = feet above mean sea level

<sup>e</sup> gpm = gallons per minute

--- = no available data

D = Domestic I = Irrigation

<sup>f</sup> Water Use:

<sup>g</sup> Logs: D = Driller's

# **APPENDIX C**

# SUMMARY OF WELL RECORDS FROM ADWR 55-WELL REGISTRY

					CASIN	IG		NON-PL	JMPING WAT	FER LEVEL					
CADASTRAL LOCATION	ADWR WELL REGISTRY NUMBER	- OWNER	DATE COMPLETED	DEPTH DRILLED (ft, bls) <sup>a</sup>	DIAMETER (inches)	DEPTH (feet)	ALTITUDE OF LAND SURFACE (ft, msl) <sup>b</sup>	DEPTH (ft, bls)	DEPTH (m, bls) <sup>c</sup>	DATE MEASURED	ALTITUDE (ft, msl)	PUMPING RATE (gpm) <sup>d</sup>	WATER USE <sup>6</sup>	LOGS	WELL COMMENTS
(A-01-11) 36ca	600826	TONTO NATL FOREST	1/1/1956										S		Cottonwood Windmill 48-115
(A-01-12) 36bac	907314	CARLOTA COPPER COMPANY											NONE		not on map; wrong location; should be A-1-13
(A-01-13) 19bbd	542238	BHP COPPER INC,											MON		not on map; wrong location and canceled
(A-01-13) 19bbd	542239	BHP COPPER INC,											MON		not on map; wrong location and canceled
(A-01-13) 19bbd	542240	BHP COPPER INC,											MON		not on map; wrong location and canceled
(A-01-13) 19bbd	542241	BHP COPPER INC											MON		not on map; wrong location and canceled
(A-01-13) 31	218084	CARLOTA COPPER COMPANY, SUBSIDIARY OF QUADRA MINING, LTD.											т		not on map; geotechnical borings RH001 through RH003; wrong location actually in Cactus-Carlota pit; duplicate of 909429
(A-01-13) 31	909429	CARLOTA COPPER COMPANY, SUBSIDIARY OF QUADRA MINING, LTD.											NONE		not on map; geotechnical borings RH001 through RH003; wrong location actually in Cactus-Carlota pit; duplicate of 218084
(A-01-13) 31cbc	533259	CARLOTA COPPER COMPANY	2/4/1992	200	6	200		140	42.7	2/4/1992			MON	D	not on map; MW-7; wrong location, should be A-1-14
(D-01-11) 01ba	600800	TONTO NATL FOREST	1/1/1956										S		Valles Well #2 48-025
(D-01-11) 11ca	600799	TONTO NATL FOREST	1/1/1966										S		Byous Windmill 48-035; outside boundary
(D-01-11) 13ba	600828	TONTO NATL FOREST	1/1/1956										S		Preston Windmill 48-045
(D-01-11) 35ddc	514505	BERRY, GENE	6/10/1986	100	5	100		60	18.3	6/10/1986			D	D	
(D-01-12) 02caa	218637	RESOLUTION COPPER MINING LLC											MON		not on map; DHRES-E; wrong location; drilled as DHRES-13 in D-2-12
(D-01-12) 02ccc	550994	GOMEZ, JESUS,	9/1/1995	760	8	760		125	38.1	9/1/1995			D	D	not on map; wrong location; should be in Tucson
(D-01-12) 03baa	906344	RESOLUTION COPPER MINING, LLC	1/30/2007	12	2	12		5	1.5	1/30/2007			MON	D	not on map; wrong location; later drilled as DHRES-13 in D-2-12
(D-01-12) 03bdb	631205	PADILLA.F N											I,D		not on map; wrong location; should be D-2-12
(D-01-12) 03bdb	631206	PADILLA,F N											I,D		not on map; wrong location; should be D-2-12
(D-01-12) 13	801491	PETTIJOHN,C E	1/1/1900	80	6	50		130	39.6	1/1/1900		150	IND,MIN		
. ,	562908	CHARLES E PETTIJOHN	6/3/1998	400	2	20								 D	
(D-01-12) 13aab					=										and an annual day's discourse to define
(D-01-12) 13aab	581594	JOHN H DALTON SR													not on map; denied permission to drill
(D-01-12) 16db	600935	TONTO NATL FOREST	1/1/1956										S		Cottonwood Well 48-125
(D-01-12) 19cb	600827	TONTO NATL FOREST	6/30/1956										S		Noble Windmill 48-135
(D-01-12) 24	801492	PETTIJOHN,C E	1/1/1900	80	6	50		30	9.1	1/1/1900		150	IND,MIN		
(D-01-12) 24	909919	OMYA ARIZONA INC.											NONE		3 mineral exploration wells; no wells installed
(D-01-12) 25	519696	BHP COPPER INC,	12/11/1987	397									NONE	D	2 HOLES; mineral exploration well; hole 15 abandoned
(D-01-12) 26acc	912289	RESOLUTION	8/7/2010	2130	4	2130		100	30.5	8/7/2010			MON	D	DHRES-09; wrong location in 55-registry; better location in monitor well table
(D-01-12) 26cdc	558204	BHP COPPER	8/26/1996	430									MON	D	monitor well MCC-7
(D-01-12) 27aad	501253	TONTO NATL FOREST	10/21/1981	40	6	40		25	7.6	10/21/1981		2	S	D	Silver King Well
(D-01-12) 31dd	600883	TONTO NATL FOREST	1/1/1956										S		Rice Well 48-155
(D-01-12) 32	914002	FREEPORT MCMORAN COPPER & GOLD SUPERIOR											NONE		First part of boreholes drilled by Layne Christensen Co. #7, boreholes completed by National EWP, Inc. #823; better location per M&A field reconnaissance
(D-01-12) 33	914003	FREEPORT MCMORAN COPPER & GOLD - SUPERIOR											NONE		better location per M&A field reconnaissance
(D-01-12) 34	594161	BHP COPPER INC											OME		mineral exploration
(D-01-12) 34	594163	BHP COPPER INC											OME		mineral exploration
(D-01-12) 34aac	522271	SOUTHWEST GAS CORP,	12/2/1988	120									NONE	D	cathodic protection
(D-01-12) 34adb	548184	RESOLUTION COPPER MINING LLC	3/26/1995	93	4	35		42	12.8	3/26/1995			MON	D	monitor well MCC-3
(D-01-12) 34adb	550412	RESOLUTION COPPER MINING LLC											MON		monitor well MCC-1B
(D-01-12) 34adc	594157	BHP COPPER INC											MON		
(D-01-12) 34adc	594159	BHP COPPER INC											MON		
(D-01-12) 34add	591860	BHP BILLITON		440		200		187	57.0				Т	D	North Well
(D-01-12) 34dbc	218677	RESOLUTION COPPER MINING LLC	3/7/2009	3018	5	3021							MON	D	DHRES-05 before modification
(D-01-12) 34dbc	550404	RESOLUTION COPPER MINING LLC											MON		monitor well MCC-6D
	550404	RESOLUTION COPPER MINING LLC											MON		not on map; monitor well MCC-6B duplicate
(D-01-12) 34dbc (D-01-12) 34dbc	550405 550406	RESOLUTION COPPER MINING LLC RESOLUTION COPPER MINING LLC											MON		not on map; monitor well MCC-6B duplicate not on map; monitor well MCC-6C duplicate
. ,															
(D-01-12) 34dbc	558205	RESOLUTION COPPER MINING LLC	7/16/1996	600	5	580		42	12.8	7/16/1996			MON	D	monitor well MCC-6B
(D-01-12) 34dbc	558206	RESOLUTION COPPER MINING LLC	7/24/1996	225	5	220		48	14.6	7/24/1996			MON	D	monitor well MCC-6A
(D-01-12) 34dbc	563621	RESOLUTION COPPER MINING LLC	8/19/1997	55		30		30	9.1	8/19/1997			MON	D	monitor well MCC-6C
(D-01-12) 34dbc	912420	RESOLUTION COPPER	8/28/2010	4018	4	4018		270	82.3	8/28/2010			MON	D	DHRES-05 after 2010 modification
(D-01-12) 34dda	550410	RESOLUTION COPPER MINING LLC		-									MON		monitor well MCC-2B
(D-01-12) 34dda	550411	RESOLUTION COPPER MINING LLC											MON		monitor well MCC-2D

Image:         Image:<						CASIN	G		NON-PL	IMPING WAT	ER LEVEL				1	
District 3         State		REGISTRY	OWNER		DRILLED			OF LAND SURFACE		-			RATE		LOGS	WELL COMMENTS
Dist 10         Bis 12	(D-01-12) 34dda	558209		8/21/1996	225				145	44.2	8/21/1996		0	NONE	D	not on map; 1 geotechnical HOLE/ABND-8-21-96; canceled
Discription         Bis Hist         Bescher Reich	(D-01-12) 35	519005	RESOLUTION COPPER MINING LLC	9/21/1987										NONE	D	9 HOLES: mineral exploration; all abandoned
Displace         Bisting         Mode Name         Turning         10        10         10         1		594162				-								OME		mineral exploration
Dip -1:3         Goldson         JOULD, JOE Mar BIRMUN         T12/1118         No.         Inc.         No.         Inc.         No.         Second T12/06, processor 3/2           Dip -11:3         Social         BELLINDE COPPER NNNGL LIC         Inc.         Inc.        Inc.	(D-01-12) 35	594164	BHP COPPER INC											OME		mineral exploration
Displace         Marcel         Marcel         Marcel         Marcel         Department         Department           Displace         Marcel         Marcel         Marcel         Marcel         Marcel         Marcel         Department           Displace         Marcel         Marcel         Marcel         Marcel         Marcel         Marcel         Marcel           Displace         Marcel         Ma						10										
Display         Junn         Security Model						6	300						10			deepend 11/21/96; previously 75 ft
BODY OF COMPARIANCE LC         TODE NOT COMPARIANCE LC <thtode compariance="" lc<="" not="" th=""> <thtode comparia<="" not="" td=""><td></td><td></td><td></td><td>2/2/2007</td><td>20</td><td></td><td></td><td></td><td>15</td><td>4.6</td><td>2/2/2007</td><td></td><td></td><td></td><td>D</td><td>geotch boring; abandoned</td></thtode></thtode>				2/2/2007	20				15	4.6	2/2/2007				D	geotch boring; abandoned
On-12 abox         Field Park         Field P																3/22/2012
Oph-14         Status         Status<																
Oph-12 Seed         SetSULTION COPPER INSIGN LC             NON          NON          NON         NO         NO         NO         NO         NO         NO         NO         NO						32		3156.75				2.75				
De1-19         Beschultzen CopPers Names         L         m <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td>D</td><td></td></th<>														-	D	
Diel 2 3984         2 3084         Ber 3 2984         Die 3 3984         2 3084         Die 3 3984         2 3084         2 308 <t< td=""><td></td><td></td><td></td><td>5/24/2007</td><td>190</td><td>10</td><td>185</td><td></td><td>60</td><td>18.3</td><td>5/24/2007</td><td></td><td></td><td></td><td></td><td>Settling pond 1 &amp; 2 alert well</td></t<>				5/24/2007	190	10	185		60	18.3	5/24/2007					Settling pond 1 & 2 alert well
Oph-12         State         State <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>																
Diel 13 3864         9 4947         RESULTION COPER NAME LLC         9 216200         216 2000         217 2000          MON         D         Diskes 32 1897           Diel 13 3864         9 5897         RESOLTION COPER NAME LLC         9 21000         88         5         81             NONE          NONE          NONE         NONE         NONE         NONE         NONE         NONE          NONE          NONE																
Bit Display				2/28/2009	2340	5	2340				2/28/2009			MON	D	
Dight 255         55157         RESOLUTION COPPER MINNENCL  MON          montarial          MOX          montarial          MOX          MOX					1962	3	1940			0.0	2/16/2009				D	
Oph-10         Sector         ESOLUTION COPPER NUNRG LLC	(D-01-12) 35bdd	910699		5/12/2009	88	5	81		67	20.4	5/12/2009			MON	D	WELL CAPPED
Op-10:12 Social         SOLUTION COMPREX NUNKO LLD              NON          NON																
Op-112 3560         OSSUPTION COPPER NINNO LLC         779/1996         1         4         14.6         779/1996           MON         D         monitor well MCC-88           Op-112 3560         907098         RESOLUTION COPPER COMPLAY         557/2007         130         10         125          120         36.6         579/2007           MON         D         Tailing pord 5           0-112 3560         907098         RESOLUTION COPPER NINKIG LC         571/2007         130         10         125          110         33.5         571/2008           MON         D         The forced row at later the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, differ realized metake and index status were take the fact, di	(D-01-12) 35cab	550403	RESOLUTION COPPER MINING LLC											MON		monitor well MCC-5D
Oph-102 state         40088         BMACKELPORD, LEROY,H         44/91/997         20         4         240             7         D         D         Interpretation           D0-112 state         91088         RESOLUTION COPPER COMPANY         5322007         10         10         125          110         38.5         5122000           MON         D         Tailing port 5           D0-112 state         91088         RESOLUTION COPPER MINING LLC         5122000         180         10         21          110         38.5         5122000           MON         D         MCF-SA; bandword to credit LVM-Mol product JVM COP         Month Mol product JVM CO         MON         D         MCL AVEL JVM LAVEL JVM JVM CO         Month Mol JVM CO         Month Mol JVM CO         Month Mol JVM LAVEL	(D-01-12) 35cab													-		
Op/1013         State         <		558207			100	5	92		48	14.6	7/29/1996			MON	D	monitor well MCC-5B
(D-11-12)         Stable         P10698         RESOLUTION COPPER MINNG LLC         5122009         110         33.5         5122009          MON         D         The T23209 modification was after the fac, differentiatian entistate and metable and modified of malable and modified	(D-01-12) 35cac	560980			240	4	240						7	D	D	
Image: Probability         Image:																Tailing pond 5
D0-11-23         Secolution COPPER MINING LLC         1292007         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17         2         17<	(D-01-12) 35cba	910698			180	10				33.5	5/12/2009			MON	D	came forward to correct it voluntarily. No drilling authority actually went out as the procedure was already completed. Drill log for initial and modified drilling submitted on 7/23/2009. LC; TP-5
D0-112         Stock         ESOLUTION COPPER MINING LLC         ···         MON         ···         monitor well MCC-3D           (D-112)         Stock         S50411         RESOLUTION COPPER MINING LLC         ···         ···         ···         ···<					325				59		3/29/1995				D	
D01-12         Stability         RESOLUTION COPPER MINING LLC         ···<         ···<         ···<         ···<         ···<         ···<         ···<         ···<         ···         ···         ···         ···         ···<         ···         ···<         ···<         ····         ··				1/29/2007	17	2	17		8	2.4	1/29/2007				D	
D0-112         Statu         RESOLUTION COPPER MINING LLC             MON          MON          monitor well MCC-3A           (D-01-12)         State         F5820L         RESOLUTION COPPER MINING LLC         322/1995         500         4         500          8         2.4         7/27/1996          MON         D         monitor well MCC-3B           (D-01-12)         Stade         56822         RESOLUTION COPPER MINING LLC         322/1997         122         4         82          44         13.4         822/1997          MON         D         monitor well MCC-3B           (D-01-12)         Stade         90736         RESOLUTION COPPER MINING LLC         12/2/2/207         7         2         17         52         1/2/2/207          MON         D         monitor well MCC-3B           (D-01-12)         Stada         914374         RESOLUTION COPPER MINING LLC           4         4           MON         D         MOI obj, no completion report           (D-112)         Stada         914374         RESOLUTION COPPER MINING LLC																
ID-112 35db       558208       RESOLUTION COPPER MINING LLC       727/1998       390       5       380        8       2.4       727/1996        MON       D       monitor well MCC-3B         (D-01-12) 35db       568186       RESOLUTION COPPER MINING LLC       322/1997       12       4       4       13.4       820197        MON       D       monitor well MCC-3C         (D-01-12) 35db       960298       RESOLUTION COPPER MINING LLC       125/2007       27       2       27        44       13.4       820197        MON       D       monitor well MCC-3C         (D-01-12) 35db       997037       RESOLUTION COPPER MINING LLC       125/2007       27       2       27        17       5.2       125/207        MON       D       WEDU GADE       WEDU GADE        MON       D       WEDU GADE        MON        MON        MON       D       WEDU GADE        MON        MON        MON        MON        MON        MON        MON        MON        MON        MON <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>																
D-01-12) 336dc         54818         RESOLUTION COPPER MINING LLC         3/23/1985         500         4         500         4         60         0.0         3/23/1985          MON         D         monitor well MCC-3           (D-01-12) 356dc         966382         RESOLUTION COPPER MINING LLC         18/20/1997         12         4         82          17         52         11/25/2007          MON         D         monitor well MCC-3           (D-01-12) 356dc         906298         RESOLUTION COPPER MINING LLC         12/2         2         2         7          17         52         11/25/2007          MON         D         Well CAPPED; LSP-6           (D-01-12) 356db         91437         RESOLUTION COPPER MINING LLC               MON          MOI n); no completion report           (D-01-12) 356db         91437         RESOLUTION COPPER MINING LLC               MON          NO only, no completion report           (D-11-2) 356db         914373         RESOLUTION COPPER MINING, LLC																
(D-01-12) 35cdc       583622       RESOLUTION COPPER MINING LLC       8/20/1997       122       4       82        44       13.4       8/20/1997        MON       D       monitor well MCC-3C         (D-01-12) 35cdc       906298       RESOLUTION COPPER MINING, LL       1/25/2007       27       2       27        17       5.2       1/25/2007        MON       D       monitor well MCC-3C         (D-01-12) 35dba       914372       RESOLUTION COPPER MINING LLC            MON       D       MOI D       S00 yd well         (D-01-12) 35dba       914374       RESOLUTION COPPER MINING LLC             MON        MOI D       NOI only, no completion report         (D-01-12) 35dba       914374       RESOLUTION COPPER MINING LLC          200       61.0       1/10/1997        MON        MON D       NOI only, no completion report         (D-01-12) 35dba       914373       RESOLUTION COPPER MINING LLC          44        40       1/10/1997        15       D      <									8	2.4					D	
(D01-12) 35cdc         906288         RESOLUTION COPPER MINING, LLC         1/25/2007         27         2         27          17         5.2         1/25/2007          MON         D         WELL CAPPED; LSP-6           (D-01-12) 35dab         907035         RESOLUTION COPPER MINING LLC             MON         D         500 yeel           (D-01-12) 35dab         914374         RESOLUTION COPPER MINING LLC              MON         NOI only, no completion report           (D-01-12) 35dab         914374         RESOLUTION COPPER MINING LLC               MON          MON          NOI only, no completion report           (D-01-12) 35dbc         914373         RESOLUTION COPPER MINING, LLC            200         61.0         1/10/1997          15         D          NOI only, no completion report           (D-01-12) 35dbc         914373         RESOLUTION COPPER MINING, LLC              MON          NOI only, no completion report									0		3/23/1995				D	
(D-01-12) 35dab       907035       RESOLUTION COPPER MINING LLC       140 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>																
(D-01-12) 35dba         914372         RESOLUTION COPPER MINING LLC              MON          MOI only, no completion report           (D-01-12) 35dba         914374         RESOLUTION COPPER MINING LLC              MON          MON          MOI only, no completion report           (D-01-12) 35dba         807409         WALKER, GLADYSM         1/10/1997              MON          MON          MON prophetion report           (D-01-12) 35dba         807409         WALKER, GLADYSM         1/10/1997                                      MON          NOI only, no completion report           (D-0112) 3650         803944         NADER, GERTRUDE L         4/1/4/1968									17	5.2	1/25/2007					
(D-01-12) 35dba         914374         RESOLUTION COPPER MINING LLC               MON          NOI only, no completion report           (D-01-12) 35dbc         807409         WALKER, GLADYS,M         1/10/1997         265         6           200         61.0         1/10/1997          15         D          DEEPEN. ORIGINAL LEGAL WAS ENTERED INTO WELLS 55 INCORRCTLY.RL           (D-01-12) 35dbc         801433         RESOLUTION COPPER MINING,LLC                MON          NOI only, no completion report           (D-01-12) 35dbc         801434         NADER, GERTRUDE L         4/14/1968         125          10         3.0         4/14/1968          30         D          NOI only, no completion report           (D-01-12) 35dbc         650939         GUERRA, G.E          42          4															D	
(D-01-12) 35dbc       807409       WALKER, GLADYS,M       1/10/1997       265       6        200       61.0       1/10/1997        15       D        DEEPEN. ORIGINAL LEGAL WAS ENTERED INTO WELLS 55 INCORRECTLY.RL         (D-01-12) 35dbc       914373       RESOLUTION COPPER MINING, LLC             MON        NOI only, no completion report         (D-01-12) 35dbc       803944       NADER, GERTRUDE L       4/14/1968       125       8       125        10       3.0       4/14/1986        30       D          (D-01-12) 35dbc       660993       GUERRA,G E        42        4        36       11.0         25       I           4        36       11.0         0       6HOL5S: 5 mineral exploration holes drilled and abandoned																
(D-01-12) 35dbc         914373         RESOLUTION COPPER MINING, LLC         ···         MON         ···         NOI only, no completion report           (D-01-12) 35dbc         65093         GUERRA,G E         ···         42         ···         4         ···         36         10         ···         30         D         ···         Image: Completion report           (D-01-12) 35dbc         550307         RESOLUTION COPPER MINING LLC         10/24/1987         ···<											1/10/1997					DEEPEN. ORIGINAL LEGAL WAS ENTERED INTO WELLS 55
(D-01-12) 33dc         650993         GUERRA,G E          42          4          36         11.0           25         I          Provide           (D-01-12) 36         519007         RESOLUTION COPPER MINING LLC         10/24/1987             NONE         D         6 HOLES: 5 mineral exploration holes drilled and abandoned           (D-01-12) 36bbc         525311         RESOLUTION COPPER MINING LLC               MIN          Shift No. 3           (D-01-13) 07ccc         86780         AUTSON,R                MIN          Shift No. 3           (D-01-13) 07ccc         86780         AUTSON,R                  D          canceled           (D-01-13) 07da         600812         TONTO NATL FOREST         11/1/1980             S          Upper Queen Horizontal well 48-175	(D-01-12) 35dbc	914373	RESOLUTION COPPER MINING, LLC											MON		
(D-01-12) 36         519007         RESOLUTION COPPER MINING LLC         10/24/1987         ··· </td <td></td> <td></td> <td></td> <td>4/14/1968</td> <td></td> <td>8</td> <td></td> <td></td> <td></td> <td></td> <td>4/14/1986</td> <td></td> <td></td> <td>D</td> <td></td> <td></td>				4/14/1968		8					4/14/1986			D		
(D-01-12) 36bbc         525311         RESOLUTION COPPER MINING LLC         ···         ···         ···         ···         ···         ···         ···         ···         ···         ···         ···         ···         ···         ···         ···         ···         MIN         ···         Shaft No. 3           (D-01-13) 07ccc         86780         AUTSON,R         ···         ···         ···         ···         ···         ···         ···         D         ···         canceled           (D-01-13) 07da         600812         TONTO NATL FOREST         1/1/1980         ···         ···         ···         ···         ···         S         ···<	(D-01-12) 35dc	650993	GUERRA,G E		42		4		36	11.0			25	I		
(D-01-13) 07ccc         86780         AUTSON,R               D          canceled           (D-01-13) 07da         600812         TONTO NATL FOREST         12/31/1980              S          Upper Queen Horizontal well 48-175           (D-01-13) 07da         600813         TONTO NATL FOREST         1/1/1980              S          Queen Horizontal well 48-165           (D-01-13) 07da         600813         TONTO NATL FOREST         1/1/1980              S          Queen Horizontal well 48-165           (D-01-13) 07da         600813         INTEGRITY LAND AND CATTLE, LLC          180         2         180          5         1.5           S          Queen Horizontal well 48-165           (D-01-13) 17         907478         INTEGRITY LAND AND CATTLE, LLC          180             NONE          2 mineral exploration holes           (D-0	(D-01-12) 36	519007	RESOLUTION COPPER MINING LLC	10/24/1987										NONE	D	6 HOLES: 5 mineral exploration holes drilled and abandoned
(D-01-13) 07da         600812         TONTO NATL FOREST         12/31/1980               S          Upper Queen Horizontal well 48-175           (D-01-13) 07dd         600813         TONTO NATL FOREST         1/1/1980             S          Queen Horizontal well 48-165           (D-01-13) 07dd         600889         INTEGRITY LAND AND CATTLE, LLC          180         2         180          5          S          JI RANCH           (D-01-13) 07         90747         90740         9/10/2007          1	(D-01-12) 36bbc	525311	RESOLUTION COPPER MINING LLC											MIN		Shaft No. 3
(D-01-13) 07dd         600813         TONTO NATL FOREST         11/1/1980         ···         ···         ···         ···         ···         ···         ···         S         ···         Queen Horizontal well 48-165           (D-01-13) 07ddc         609689         INTEGRITY LAND AND CATTLE, LLC         ···         180         2         180         ···         5         1.5         ···         ···         35         S         ···         JI RANCH           (D-01-13) 17         907478         OMYA ARIZONA INC.         9/10/2007         ···         ···         ···         ···         ···         ···         NONE         ···         14 mineral exploration holes           (D-01-13) 17         90920         OMYA ARIZONA INC.         11/30/2008         ···         ···         ···         ···         ···         ···         NONE         ···         1 mineral exploration holes           (D-01-13) 17         90920         OMYA ARIZONA INC.         11/30/2008         ···         ···         ···         ···         ···         ···         ···         ···         ···         NONE         ···         2 mineral exploration holes           (D-01-13) 17 bbd         609683         INTEGRITY LAND AND CATTLE, LLC         ···         180 <td< td=""><td>(D-01-13) 07ccc</td><td>86780</td><td>AUTSON,R</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>D</td><td></td><td>canceled</td></td<>	(D-01-13) 07ccc	86780	AUTSON,R											D		canceled
(D-01-13) 07ddc         609689         INTEGRITY LAND AND CATTLE, LLC          180         2         180          5         1.5          35         S          JRANCH           (D-01-13) 17         907478         OMYA ARIZONA INC.         9/10/2007              NONE          14 mineral exploration holes           (D-01-13) 17         909920         OMYA ARIZONA INC.         11/30/2008              NONE          14 mineral exploration holes           (D-01-13) 17         909920         OMYA ARIZONA INC.         11/30/2008               NONE          2 mineral exploration holes           (D-01-13) 17 bbd         609683         INTEGRITY LAND AND CATTLE, LLC          180         2         180              10         S          JI RANCH	(D-01-13) 07da	600812	TONTO NATL FOREST	12/31/1980										S		Upper Queen Horizontal well 48-175
(D-01-13) 17         907478         OMYA ARIZONA INC.         9/10/2007         ···         ···         ···         ···         ···         ···         ···         ···         ···         NONE         ···         14 mineral exploration holes           (D-01-13) 17         909920         OMYA ARIZONA INC.         11/30/2008         ···         ···         ···         ···         ···         ···         NONE         ···         14 mineral exploration holes           (D-01-13) 17         909920         OMYA ARIZONA INC.         11/30/2008         ···         ···         ···         ···         ···         NONE         ···         2 mineral exploration holes           (D-01-13) 17bbd         609683         INTEGRITY LAND AND CATTLE, LLC         ···         180         ···         ···         ···         ···         ···         10         S         ···         JI RANCH	(D-01-13) 07dd	600813	TONTO NATL FOREST	1/1/1980										S		Queen Horizontal well 48-165
(D-01-13) 17         909920         OMYA ARIZONA INC.         11/30/2008              NONE          2 mineral exploration holes           (D-01-13) 17bbd         609683         INTEGRITY LAND AND CATTLE, LLC          180         2         180            10         S          JI RANCH	(D-01-13) 07ddc	609689	INTEGRITY LAND AND CATTLE, LLC		180	2	180		5	1.5			35	S		JI RANCH
(D-01-13) 17bbd 609683 INTEGRITY LAND AND CATTLE, LLC 180 2 180 10 S JI RANCH	(D-01-13) 17	907478	OMYA ARIZONA INC.	9/10/2007										NONE		14 mineral exploration holes
	(D-01-13) 17	909920	OMYA ARIZONA INC.	11/30/2008										NONE		2 mineral exploration holes
[(D-01-13) 17dcb 609674 INTEGRITY LAND AND CATTLE. LLC 30 60 30 15 4.6 45 S Primo Station well and Primo Station Social (L.C. Gibeon)	(D-01-13) 17bbd	609683			180	2	180						10	S		JI RANCH
	(D-01-13) 17dcb	609674	INTEGRITY LAND AND CATTLE, LLC		30	60	30		15	4.6			45	S		Pump Station well and Pump Station Spring (J. C. Gibson)

					CASIN	G		NON-PL	IMPING WAT	ER LEVEL					
CADASTRAL LOCATION	ADWR WELL REGISTRY NUMBER	OWNER	DATE COMPLETED	DEPTH DRILLED (ft, bls) <sup>a</sup>	DIAMETER (inches)	DEPTH (feet)	ALTITUDE OF LAND SURFACE (ft, msl) <sup>b</sup>	DEPTH (ft, bls)	DEPTH (m, bls) <sup>c</sup>	DATE MEASURED	ALTITUDE (ft, msl)	PUMPING RATE (gpm) <sup>d</sup>	WATER USE <sup>e</sup>	LOGS	WELL COMMENTS
(D-01-13) 18	909921	OMYA ARIZONA INC.	12/5/2008										NONE		1 mineral exploration hole
(D-01-13) 19	909922	OMYA ARIZONA INC.	11/26/2008										NONE		1 mineral exploration hole
(D-01-13) 21abc	609682	INTEGRITY LAND AND CATTLE, LLC	11/1/1964	1200	6			360	109.7	11/1/1964		35	S		JI RANCH
(D-01-13) 21cbc	912601	RESOLUTION COPPER	3/3/2011	6724		6700		1010	307.8	3/3/2011			MON	D	DHRES-11
(D-01-13) 21cbc	912917	RESOLUTION COPPER MINING LLC	2/18/2011	2140	5	1987		206.21	62.9	3/2/2011			MON	D	HRES-12
(D-01-13) 29cdd	609673	INTEGRITY LAND AND CATTLE, LLC	8/9/1924	18	48	18		6	1.8	8/9/1924		80	S,D		JI RANCH Gibson well
(D-01-13) 31db	600804	TONTO NATL FOREST	1/1/1956										S		Arnett Well 48-265
(D-01-13) 32	206156	RESOLUTION COPPER MINING LLC				-							OME		mineral exploration: NOI for 3 holes; 32bdd, 32dbd, and 32dca
(D-01-13) 32	526327	MAGMA COPPER CO,											NONE		canceled
(D-01-13) 32	557633	BHP COPPER INC,											NONE		2 HOLES/NOT DRILLED; canceled
(D-01-13) 32aac	912634	RESOLUTION COPPER MINING LLC		6735	4	3802							OME		RES-22
(D-01-13) 32bac	912625	RESOLUTION COPPER MINING LLC		7310	4	3609							OME		RES-23
(D-01-13) 32bbd	525312	RESOLUTION COPPER MINING LLC											MIN		Shaft No. 9
(D-01-13) 32bca	201852	RESOLUTION COPPER MINING LLC	2/13/2004	1600	5	1600							MON	D	HRES-01
(D-01-13) 32bdd	213994	RESOLUTION COPPER MINING LLC		7634	4	3327							OME		RES-6
(D-01-13) 32bdd	512401	U OF A HYDR/WTR RESOUR	10/1/1985										NONE	D	3 WELLS: 60, 107, and 153 feet
(D-01-13) 32bdd	516107	UNIV OF AZ	11/10/1986	146	4	5							NONE	D	HYDROLOGY 6 WELLS:
(D-01-13) 32caa	217417	RESOLUTION COPPER MINING, LLC		6485	10	6485		300	91.4				MON		RES #18
(D-01-13) 32cab	217418	RESOLUTION COPPER MINING, LLC											OME		RES #19
(D-01-13) 32cab	218877	RESOLUTION COPPER MINING, LLC		1535	6	1535							OME		RES 19
(D-01-13) 32cab	536975	UNIVERSITY OF ARIZONA/DEPT OF HYDROLOGY	1/6/1993	662	6			634	193.2	1/6/1993			NONE	D	1 HOLE: abandoned 1/28/2000
(D-01-13) 32cab	546847	UNIVERSITY OF ARIZON,A	12/16/1994	560	8	560		555	169.2	12/16/1994			NONE	D	geotechnical hole
(D-01-13) 32cab	911951	RESOLUTION COPPER MINING LLC											OME		mineral exploration
(D-01-13) 32dbb	914053	RESOLUTION COPPER MINING											NONE		mineral exploration
(D-01-13) 32dbd	206873	RESOLUTION COPPER MINING LLC											NONE		THREE HOLES: RES-6, RES-7, & RES-8 RES-8 WAS COMPLETED ON 8/3/2005 AS 55-206873. RES-6 WILL BE DEEPENED AND ASSIGNED TO NEW WELL REGISTRATION NUMBER 55-213994. RES-7 WILL BE MODIFIED TO A MONITOR WELL AND WILL BE ASSIGNED TO NEW WELL REGISTRATION NUMBER
(D-01-13) 32dbd	213993	RESOLUTION COPPER MINING LLC											MON		RES-7 THIS WELL WAS ORIGINALLY DRILLED AS AN EXPLORATION WELL UNDER 55-206873 (1 OF 3 HOLES). OWNER WANTS TO MODIFY ONE HOLE TO BE A MONITOR WELL.
(D-01-13) 32dbd	217407	RESOLUTION COPPER MINING LLC	9/11/2008	6713	5	65555		1935	589.8	9/11/2008			MON	D	DHRES-02
(D-01-13) 32dbd	551745	RESOLUTION COPPER MINING LLC	2/13/1996										NONE	D	2 mineral exploration HOLES; abandoned
(D-01-13) 32dbd	590833	RESOLUTION COPPER MINING LLC	1/30/2003		4	3789							NONE	D	RES-04
(D-01-13) 32dbd	913244	RESOLUTION COPPER MINING LLC		7477	4	3369							OME		RES-09
(D-01-13) 32dca	201850	RESOLUTION COPPER MINING LLC	2/19/2004	1310	5	1310		295	89.9	3/26/2004			MON	D	HRES-02
(D-01-13) 32dca	599453	RESOLUTION COPPER MINING LLC													RES-6
(D-01-13) 32dcd	532680	MAGMA COPPER CO,											NONE		1 WELL; canceled
(D-01-13) 32dcd	562940	BHP COPPER INC	2/4/1998	2945	4	2945		5354	1631.9	2/4/1998			NONE		3 HOLES. Disregard action code 815 on 10/8/98 Capped
(D-01-13) 32dcd	587213	RESOLUTION COPPER MINING LLC			4	5820							Т	D	RES-3
(D-01-13) 33ccd	201849	RESOLUTION COPPER MINING LLC	3/5/2004	1440	5	1440		401	122.2	3/26/2004			MON	D	HRES-04
(D-01-13) 33ccd	217151	RESOLUTION COPPER MINING, LLC	4/15/2008	6872	14	36872							OME	D	RES-015
(D-01-13) 33ccd	217406	RESOLUTION COPPER MINING LLC	6/23/2008	6002	7	6002		1916	584.0	6/23/2008			1	D	DHRES-01
(D-01-13) 33ccd	592574	RESOLUTION COPPER MINING LLC	1/19/2003	7563	4	4767		2400	731.5	1/19/2003			OME	D	RES-5
(D-02-11) 01cd	627523		1/1/1920	60	8	60		40	12.2	1/1/1920		40	D,S		
(D-02-11) 01cda	215463	FRANCIS PHYLLIS HERRON											1		
(D-02-11) 01cda	908053	FRANK HERRON	10/28/2007	400	5	400		68	20.7	10/28/2007		35	D	D	PUMP INSTALLED
(D-02-11) 01cdc	582656	JAMES & PHYLLIS HERRON											1		
(D-02-11) 01cdc	582657			150	5	150						25	D	D	This will be a second and a second
(D-02-11) 01cdc	627522	FRANK HERRON		60	8	60		40	12.2			500	1		This well was never abandoned per letter from owners. dlt 12/24/2008
(D-02-11) 01cdc	627524	FRANK HERRON	1/1/1946	60	8	60		40	12.2	1/1/1946		10	D,S		this well was never abandoned per owner. dlt 4/1/2009

Norme         Norme <th< th=""><th></th><th></th><th></th><th></th><th></th><th>CASIN</th><th>IG</th><th></th><th>NON-PL</th><th>JMPING WAT</th><th>ER LEVEL</th><th></th><th></th><th></th><th></th></th<>						CASIN	IG		NON-PL	JMPING WAT	ER LEVEL				
Bits         State         Bits         State         S		REGISTRY	OWNER		DRILLED			OF LAND SURFACE		-		RATE		LOGS	WELL COMMENTS
Bar         Bar <td></td> <td>904495</td> <td></td> <td>3/22/2006</td> <td>60</td> <td>2</td> <td>60</td> <td></td> <td>36</td> <td>11.0</td> <td></td> <td> </td> <td>MON</td> <td>D</td> <td></td>		904495		3/22/2006	60	2	60		36	11.0		 	MON	D	
Dies 1         Dies 1<															Ramsey of ADWR. Well location found to be off by approximately one mile. Inspection confirmed the existance of a 3° thick cement grout surface seal to a depth of 15 inches below grade. Legal description corrected in WELLS 55. Citation to be sent to driller for failing to submit
Birley Model         Series Model         Mandex C         Series Model					100	6	100		30	9.1	1/27/1988	 20		D	
One-OFTIME         BORM         Control NALE DREES,         OPTIONALE DRES,        OPTIONALE DREES,															
Disc. 19700Sunva and surva untry uns.orm95/902.002.004.00.00.000.00.00<											3/9/1983	 		_	
05/2-10         01947         RESQUIPING COPPER MING LC          4221              MON          RESQUIPING COPPER MING LC         21/2															
04-24         05/27         RESULTION COPPER NINGLIC          60         0            NOM          NOM          NOM         NOM          NOM         NOM          NOM <td></td>															
Bige 1         Bige 2         IP270         Bige 2         IP270         Bige 2         IP270         Bige 2         IPERE 3         Bige 2           Core 17:0         0         733         BY ANF 7         17         3         0															
Globel 200         Globel 200 <thglobel 200<="" th="">         Globel 200         Globel 2</thglobel>															
00-01         054000         050000         0540000         050000         0500000         0540000         050000         050														-	DHRES-13
Gibbe Josep         Gibbe Josep <thgibe josep<="" th=""> <thgibe josep<="" th="">         &lt;</thgibe></thgibe>															
Bib															
Display         Service         Service <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>															
Displace         Displace         Pinol         Displace         Pice         Pice <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						-									
Display         99         RESOLUTION COMPREX INNEQ, LLC         2/10007         51         8           15         2/10007           NONE         D         Descharing index           05-212 (Data         53330         SMERON, RELIARD         11/13190         160             NONE         D         IVELL CAPH12630.           05-212 (Data         53330         SMERON, RELIARD             D           Reliand         D           D           D           D           D           D           D           D           D           D           D           D         D           D           D         D           D         D          D         D          D         D         D         D															
Dock 1003         6 58800         MENDOGA H M         11/1982         0         1         0                NDB           D         IIII Control           IIIII Control          D         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII															
Display 1000-02-10 30000         SUMMENT 64 SCORP, RUMARD, in         Image in the image intermet in the image intermet inte														D	geotechnical holes
Dipole 2003ab         Sequestion         Test         Test </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td>							-						-		
Display and state         Organization         Organiza															
Die Die Josaan         GARTH         11/1188         2:86         8         2:86         9         1         1/1188          T         D          T         D         method           0:0:0:1000         67:547         TEC.OO LIC.OMPANY         69:01999         30         5         14            T         D         method         method           0:0:2:100aad         63:366         LLCKE J & JOY EVELAND         1/1/197         117         4         117              D          D          D          D          D          D          D          D          D          D          D          D          D          D          D          D          D          D         D          Canceled         D          Canceled         D          Canceled         D          Canceled         D         D          Canceled<															canceled
Dipole 2003 and 57549         TREJO OIL COMPANY         900 1999         30         5         30															
Dipole 10 Gased         State of the Control Company         61/19/199         30         5         14             MON         D         MM-1 @ Tiger Mart #115, 805 West Highway 80, Superior, AZ. mb           (Do2:12) Gased         635968         LUCKE J & JOY EVELAND         11/1/1971         117         4         117              D          D          D          D          D          D          D          D          D          D          D          D          D          D          D          D          D         D          D         D          D						-								 D	mw-2
(b) 02-12) 03aad       035868       LUCKE J & JOY EVELAND       1/1/1979       117       44       117             0         0        0        0        0        0        0        0        0        0        0        0        0        0        0       0        0       0        0       0        0       0        0       0       0       0        0       0       0       0       0       0        0 <td></td>															
Dipole 10         GARTER, HW          48         8         8         48          20         6.1          Image: Constraint of the constraint of t															
Dipole 10320b       643720       LAYNE G D       11/1/1907       30       36       30        15       4.6       1/1/1907        D         D         D         D        D        D        D        D        D        D        D        D        D        D        D        D        D        D        D        D        D       D        D       D        D       D        D       D        D       D        D       D        D       D        D       D        D       D        D						-									
Dight of 2212         Dec ENTERPRISES   T         D         AIR SPARGE WELL #1; WELL CAPPED           (D-02-12) 03ach         559303         TREJO OL COMPANY         519/2001         30         4         15          12         3.7         519/2001          T         D         MW-5; abandond           (D-02-12) 03ach         69829         RESOLUTION COMPANY         4//11907         28         38         28          14         4.3         1//11907          MON         D         WELL CAPPED           (D-2-12) 03aba         069629 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>															
Dipole 212 03abb       Prescuence       Prescue															canceled
(D-2-12) 03abc       575549       TREJO OL COMPANY       11/17/1999       20       5       20        16       4.9       11/17/1999        T       D       mw-3         (D-2-12) 03abc       590303       TREJO OL COMPANY       4/182002       20       4       10        16       4.9       4/18/202        T       D       Mw-3         (D-2-12) 03abc       590325       TREJO OL COMPANY       4/18/2002       20       4       10        16       4.9       4/18/202        T       D       Mw-3         (D-2-12) 03abc       648721       LAYNE S.D       1/1/1907       28       36       28        14       4.3       1/1/1907        T       D       mw-3         (D-2-12) 03abc       906300       RESOLUTION COPPER MINING, LLC       1/262007       17       2       17        4       12       1/3/12007        MON       D       WELL CAPPED LSP-05         (D-2-12) 03bas       960300       RESOLUTION COPPER MINING LLC       1/2/2007       14       2       14       12       1/3/12007        MON       D       WELL CAPPED         (D-2															
(D-22-12) 03acb       586003       TREJO OLI COMPANY       5/9/2001       30       4       15        12       3.7       5/9/2001        T       D       MW-5; sbandoned         (D-02-12) 03acb       690392       TREJO OLI COMPANY       4/18/2002       20       4       10        16       4.9       4/18/2002        T       D       mw-6         (D-02-12) 03acb       643721       LAYNE, S.D       1/1/1907       28       38       28        14       4.3       1/1/1907        D         D         D        D        D        D        D        D        D       MW-5; sbandoned        D       D        D       D        D       D       D        D       D        D															-
(D-02-12) 03ab       590392       TREJO OIL COMPANY       4/18/2002       20       4       10        16       4.9       4/18/2002        T       D       mu-6         (D-02-12) 03ab       643721       LAYNES D       1/1/1907       28       36       28        14       4.3       1/1/1907        D        D </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td>						-								-	
(D-02-12) 03acb       643721       LAYNE,S D       11/1/1907       28       36       28        14       4.3       1/1/1907        D        D        D        D        D        D        D        D        D        D        D        D         D        D         D         D         D         D         D         D         D         D         D         D         D          D             H       12       1/1/1907         MON       D       WELL CAPPED       S       D       D        H       H       12       1/1/1/2007         MON       D       WELL CAPPED       D       D       D       D<												 			
(D-Q2-12) 03bad       606678       JOSEPHINE J SAWAIA   MON       D       WELL CAPPED LSP-05         (D-Q2-12) 03baa       906300       RESOLUTION COPPER MINING LLC       1/31/2007       17       2       17        4       1.2       1/31/2007        MON       D       WELL CAPPED         (D-Q2-12) 03baa       906300       RESOLUTION COPPER MINING LLC       1/32/2007       14       2       14        6       1.8       2/1/2007        MON       D       WELC CAPPED        MOC-9        MON       D       WELC CAPPED        MON       D												 			
(D-02-12) 03baa       996299       RESOLUTION COPPER MINING, LLC       1/26/2007       22       23       23       131/2007         MON       D       WELL CAPPED         (D-02-12) 03baa       906300       RESOLUTION COPPER MINING LLC       21/2007       11       2       14        6       1.8       21/2007        MON       D       WELL CAPPED         (D-02-12) 03bab       56360       RESOLUTION COPPER MINING LLC       1/23/2007       27       2       27        10       3.0       1/23/2007        MON       D       WELL CAPPED         (D-02-12) 03bab       906300       RESOLUTION COPPER MINING LLC       1/24/207       82       2       82       2.4       1/24/2007         MON       D       WELL CAPPED       -												 			
(D-02-12) 03baa       906300       RESOLUTION COPPER MINING, LLC       1/31/2007       17       2       17        4       1.2       1/31/2007        MON       D       WELL CAPPED         (D-02-12) 03baa       906300       RESOLUTION COPPER MINING LLC       2/1/2007       14       2       14        6       1.8       2/1/2007        MON       D       WELL CAPPED         (D-02-12) 03bab       563620       RESOLUTION COPPER MINING LLC       1/2/2007       27       2       27        10       3.0       1/2/3/2007        MON       D       WELL CAPPED         (D-02-12) 03bab       906301       RESOLUTION COPPER MINING, LLC       1/2/2/2007       27       2       27        10       3.0       1/2/3/2007        MON       D       WELL CAPPED         (D-02-12) 03bab       906301       RESOLUTION COPPER MINING LIM       1/2/2/2007       35       3       35        8       2.4       1/2/2/2007        MON       D       WELL CAPPED         (D-02-12) 03bb       594160       BHP COPPER INC            MON        Bag: NOI only;				1/26/2007	22	2	22		8	2.4	1/26/2007	 	MON	D	WELL CAPPED LSP-05
(D-02-12) 03baa       906360       RESOLUTION COPPER MINING LLC       2/1/2007       14       2       14        6       1.8       2/1/2007         MON       D       WELL CAPPED         (D-02-12) 03bab       563620       RESOLUTION COPPER MINING LLC       1/23/2007       27       2       27        10       3.0       1/23/2007        MON       D       WELL CAPPED         (D-02-12) 03bab       906302       RESOLUTION COPPER MINING, LC       1/23/2007       22       27        10       3.0       1/23/2007        MON       D       WELL CAPPED         (D-02-12) 03bab       906302       RESOLUTION COPPER MINING, LC       1/23/2007       82       2       82        MON       D       WELL CAPPED         (D-02-12) 03bab       907155       RESOLUTION COPPER MINING LLC       1/24/2007       35       3       35          MON       D       WELL CAPPED         (D-02-12) 03bbb       594160       BHP COPPER INC            MON       N       WELL CAPPED         (D-02-12) 03bbc       594160       BHP COPPER INC		906300	RESOLUTION COPPER MINING, LLC	1/31/2007	17	2	17		4	1.2	1/31/2007	 	MON	D	WELL CAPPED
(D-02-12) 03bbb       563620       RESOLUTION COPPER MINING LLC       ···< <t< td=""><td></td><td>906360</td><td>RESOLUTION COPPER MINING LLC</td><td>2/1/2007</td><td>14</td><td>2</td><td>14</td><td></td><td>6</td><td>1.8</td><td>2/1/2007</td><td> </td><td>MON</td><td>D</td><td>WELL CAPPED</td></t<>		906360	RESOLUTION COPPER MINING LLC	2/1/2007	14	2	14		6	1.8	2/1/2007	 	MON	D	WELL CAPPED
(D-02-12) 03bab       906302       RESOLUTION COPPER MINING, LLC       1/23/2007       27       2       27        10       3.0       1/23/2007         MON       D       WELL CAPPED         (D-02-12) 03bac       906301       RESOLUTION COPPER MINING, LLC       1/24/2007       82       2       82        8       2.4       1/24/2007        MON       D       WELL CAPPED         (D-02-12) 03bab       907155       RESOLUTION COPPER MINING LIMITED       6/15/2007       35       3       35          MON       D       WELL CAPPED         (D-02-12) 03bbb       594160       BHP COPPER INC             MON        slag; NOI only; no completion report         (D-02-12) 03bbc       59161       BHP BILLITON       5/3/2002       100        53           MON        slag; NOI only; no completion report         (D-02-12) 03bcb       591861       BHP BILLITON       5/3/2002       100        53          MON       D       South Well        Bag; NOI only		563620	RESOLUTION COPPER MINING LLC									 	MON		MCC-9
(D-02-12) 03bba       907155       RESOLUTION COPPER MINING LIMITED       6/15/2007       35       3       35            MON       D       WELL CAPPED         (D-02-12) 03bba       594158       BHP COPPER INC              MON        slag; NOI only; no completion report         (D-02-12) 03bbb       594160       BHP COPPER INC              MON        slag; NOI only; no completion report         (D-02-12) 03bbb       594160       BHP COPPER INC               MON        slag; NOI only; no completion report         (D-02-12) 03bbb       591861       BHP BILLITON       5/3/2002       100        53        36       11.0       5/2/2002         T       D       South Well         (D-02-12) 03bcb       545883       ADOT-EQUIP SERVICES,       12/13/1994       38       4       38        15       4.6       12/13/1994        MON       D       -		906302	RESOLUTION COPPER MINING, LLC	1/23/2007	27	2	27		10	3.0	1/23/2007	 	MON	D	WELL CAPPED
(D-02-12) 03bbb       594158       BHP COPPER INC       ···		906301	RESOLUTION COPPER MINING, LLC	1/24/2007	82	2	82		8	2.4	1/24/2007	 	MON	D	WELL CAPPED
(D-02-12) 03bbb       594160       BHP COPPER INC              Image: Noise of the state of th	(D-02-12) 03bba	907155	RESOLUTION COPPER MINING LIMITED	6/15/2007	35	3	35					 	MON	D	WELL CAPPED
(D-02-12) 03bbb       594160       BHP COPPER INC              Image: Noise of the state of th	(D-02-12) 03bbb	594158	BHP COPPER INC									 	MON		slag; NOI only; no completion report
(D-02-12) 03bcb       545883       ADDT-EQUIP SERVICES,       12/13/1994       38       4       38        15       4.6       12/13/1994        MON       D         (D-02-12) 03bcb       545884       ADDT-EQUIP SERVICES,       12/13/1994       38       4       38        15       4.6       12/13/1994        MON       D         (D-02-12) 03bcb       545926       ADDT-EQUIP SERVICES,       12/12/1994       38       4       38        15       4.6       12/12/1994        MON       D         (D-02-12) 03bcb       545926       ADDT-EQUIP SERVICES,       12/12/1994       38       4       38        15       4.6       12/12/1994         MON       D         (D-02-12) 03bcb       545927       ADDT-EQUIP SERVICES,       12/12/1994       38       4       38        15       4.6       12/12/1994         MON       D         (D-02-12) 03bcb       545927       ADDT-EQUIP SERVICES,       12/12/1994       38       4       38        15       4.6       12/12/1994         MON       D         (D-02-12) 0		594160	BHP COPPER INC									 	MON		
Op-02-12) 03bcb         545884         ADDT-EQUIP SERVICES,         12/13/1994         38         4         38          15         4.6         12/13/1994          MON         D           (D-02-12) 03bcb         545926         ADDT-EQUIP SERVICES,         12/12/1994         38         4         38          15         4.6         12/12/1994          MON         D           (D-02-12) 03bcb         545927         ADDT-EQUIP SERVICES,         12/12/1994         38         4         38          15         4.6         12/12/1994          MON         D           (D-02-12) 03bcb         545927         ADDT-EQUIP SERVICES,         12/12/1994         38         4         38          15         4.6         12/12/1994          MON         D           (D-02-12) 03bcb         545927         ADDT-EQUIP SERVICES,         12/12/1994         38         4         38          15         4.6         12/12/1994          MON         D           (D-02-12) 03bcb         559434         RUIZ, MANUEL JR,         8/31/1996         400         6         400          110         33.5         8/31/1996	(D-02-12) 03bbc	591861	BHP BILLITON	5/3/2002	100		53		36	11.0	5/2/2002	 	Т	D	South Well
(D-02-12) 03bcb       545926       ADDT-EQUIP SERVICES,       12/12/1994       38       4       38        15       4.6       12/12/1994        MON       D         (D-02-12) 03bcb       545927       ADDT-EQUIP SERVICES,       12/12/1994       38       4       38        15       4.6       12/12/1994        MON       D         (D-02-12) 03bcb       559434       RUIZ, MANUEL JR,       8/31/1996       400       6       400        110       33.5       8/31/1996        20       D,I       D	(D-02-12) 03bcb	545883	ADOT-EQUIP SERVICES,	12/13/1994	38	4	38		15	4.6	12/13/1994	 	MON	D	1
(D-02-12) 03bcb         545927         ADDT-EQUIP SERVICES,         12/12/1994         38         4         38          15         4.6         12/12/1994          MON         D           (D-02-12) 03bcd         559434         RUIZ, MANUEL JR,         8/31/1996         400         6         400          110         33.5         8/31/1996          20         D,I         D	(D-02-12) 03bcb	545884	ADOT-EQUIP SERVICES,	12/13/1994	38	4	38		15	4.6	12/13/1994	 	MON	D	1
(D-02-12) 03bcd 559434 RUIZ, MANUEL JR, 8/31/1996 400 6 400 110 33.5 8/31/1996 20 D,I D	(D-02-12) 03bcb	545926	ADOT-EQUIP SERVICES,	12/12/1994	38	4	38		15	4.6	12/12/1994	 	MON	D	
	(D-02-12) 03bcb	545927	ADOT-EQUIP SERVICES,	12/12/1994	38	4	38		15	4.6	12/12/1994	 	MON	D	
(D-02-12) 03bdc 86423 BESICK,S 1/1/1981 320 8 320 102 31.1 1/1/1981 D D	(D-02-12) 03bcd	559434	RUIZ, MANUEL JR,	8/31/1996	400	6	400		110	33.5	8/31/1996	 20	D,I	D	
	(D-02-12) 03bdc	86423	BESICK,S	1/1/1981	320	8	320		102	31.1	1/1/1981	 	D		

				CASIN	IG		NON-PL	JMPING WAT	ER LEVEL					
ADWR V CADASTRAL REGIS LOCATION NUMB	TRY	DATE COMPLETED	DEPTH DRILLED (ft, bls) <sup>a</sup>	DIAMETER (inches)	DEPTH (feet)	ALTITUDE OF LAND SURFACE (ft, msl) <sup>b</sup>	DEPTH (ft, bls)	DEPTH (m, bls) <sup>c</sup>	DATE MEASURED	ALTITUDE (ft, msl)	PUMPING RATE (gpm) <sup>d</sup>	WATER USE <sup>e</sup>	LOGS	WELL COMMENTS
(D-02-12) 03bdc 5293	16 TAMERON, JOHN,A	1/16/1991	350	7	350		320	97.5	1/16/1991		20	D	D	
(D-02-12) 03cca 6380	29 WILLIAM OLIVER	5/15/1967	140	6	140		40	12.2	5/15/1967		12	D,I		
(D-02-12) 03ccd 8640	03 BYRD,W J											D		canceled
(D-02-12) 03cd 6028	22 SMITH,F S	11/1/1954	300	8	270		260	79.2	11/1/1954		15	S		
(D-02-12) 03cdb 6350	76 FLOREZ,F M	1/1/1968	300	8	300		270	82.3	1/1/1968		10	1		
(D-02-12) 03cdc 5285	16 GOMEZ, ANGEL,	8/4/1990	360	7	360		320	97.5	8/4/1990		10	D	D	
(D-02-12) 03cdd 5062	71 AXA VASQUEZ	9/20/1983	320	8	320		280	85.3	9/20/1983		20	D	D	
(D-02-12) 03daa 4823	29 TREJO OIL COMPANY											REM		SVE-3
(D-02-12) 03daa 4823	30 TREJO OIL COMPANY											REM		SVEW-2
(D-02-12) 03daa 4823	31 TREJO OIL COMPANY											REM		SVEW-1
(D-02-12) 03dbb 2009	78 SOUTHWEST GAS CORPORATION	12/14/2003	100	12								OP	D	WELL ADDRESS IS 1001 BELMONT AVE, SUPERIOR
(D-02-12) 03dbc 6137	'80 PADILLA,O R		50									D		
(D-02-12) 03dbd 6437	22 TOMERLIN SR,J R		208	6								I		
(D-02-12) 04 6337	71 HING,A O	1/1/1958	80	2	50		20	6.1	1/1/1958		5	D		
(D-02-12) 04aaa 5412	51 YBARRA, FRANCISCO,E	1/7/1994	168	10	161		20	6.1	1/7/1994			D	D	
(D-02-12) 04aab 5636	BHP COPPER,	8/16/1997	590	5	510		50	15.2	8/16/1997			MON	D	
(D-02-12) 04aab 5636	19 BHP COPPER,		713									NONE		ABND 08/27/97; canceled
(D-02-12) 04aca 5504	08 BHP COPPER INC,											MON		MCC-4A
(D-02-12) 04aca 5582	10 BHP COPPER,	8/13/1996	420				120	36.6	8/13/1996			NONE	D	1 HOLE/ABND-8-13-96; canceled
(D-02-12) 04adb 5481	87 BHP COPPER INC,	4/1/1995	225	4	135		138	42.1	4/1/1995			MON	D	MCC-4
(D-02-12) 04add 2006	43 BHP SUPERIOR OPERATIONS											NONE		mineral exploration 10 holes
(D-02-12) 04add 9070		5/31/2007	60	5	55		53	16.2	5/31/2007			MON	D	NOI only, no completion report
(D-02-12) 04bad 5085	AZ PUBLIC SERVICE, MICHAEL TORRES	7/20/1984	150									NONE	D	anode
(D-02-12) 04bda 5538	98 HARBORLITE CORP,	10/20/1996	760	6	760		700	213.4	10/20/1996		25	С	D	
(D-02-12) 04dcd 5719	99 JOHN NORIEGA											D		NOI only, no completion report
(D-02-12) 04ddc 5567		11/21/1996	220	6	220		40	12.2	11/21/1996			D,I	D	
(D-02-12) 04ddc 5929		9/10/2002	200	5	200		110	33.5	9/10/2002		10	D	D	
(D-02-12) 05 5524		11/28/1995										NONE	D	2 HOLES/ABND-3-8-96; canceled
(D-02-12) 05cbc 6187		11/1/1963	120	8	120		45	13.7	11/1/1963		21	D		
(D-02-12) 05cda 5534		3/5/1996	80									NONE	D	1 HOLE/ABND-3-5-96; canceled
(D-02-12) 06d 6356		10/1/1940	130	6	20		40	12.2	10/1/1940		35	I,S,D		
(D-02-12) 06d 6356		4/10/1973	125	6	20		35	10.7	4/10/1973		35	I,S,D		
(D-02-12) 06daa 5524		1/25/1996	80									NONE	D	1 HOLE/ABND-3-16-96; canceled
(D-02-12) 06daa 6357		7/26/1968	96	12	25		37	11.3	7/26/1968			D		
(D-02-12) 06dac 2185		1/16/2009	200	5	200		45	13.7	1/16/2009			D	D	
(D-02-12) 06ddd 5077		4/20/1984	95	6	12		50	15.2	4/20/1984		10	D	D	
(D-02-12) 07aba 6246		1/1/1925	21	4	21		18	5.5	1/1/1925		175	IND,D		
(D-02-12) 08 5280	-	5/31/1990	110	2								NONE	D	7-11-90; canceled
(D-02-12) 08 5464	-	3/22/1995										NONE	D	2 HOLES: abandoned
(D-02-12) 08add 5204		2/8/1989	195	8	195		40	12.2	2/8/1989			D	D	
(D-02-12) 08daa 5881												IND		
(D-02-12) 09 5280	-	5/31/1990	105	2								NONE	D	7-11-90; canceled
(D-02-12) 09 5533	-	2/4/1996										NONE		4 mineral exploration HOLES: Abandoned 2-4-96
(D-02-12) 09bad 5585		8/9/1996	145	6	145		15	4.6	8/9/1996			D	D	
(D-02-12) 09bbb 5524		3/1/1996					0	0.0	3/1/1996			NONE	D	1 HOLE/ABND-3-14-96; canceled
(D-02-12) 10ba 6028	TRUSTEES	4/10/1973	300	10	300		240	73.2	4/10/1973		30	I,S,D		
(D-02-12) 10bab 8638		2/13/1981	275	1	270		90	27.4	2/13/1981		15	D		
(D-02-12) 11cbb 6246		1/1/1977	74	8	74		7	2.1	1/1/1977		16	S		
(D-02-13) 05bbb 2139		10/2/2008	7754	10	7754							OME		RES 13
(D-02-13) 05bbb 9119			6703	4	3205							OME		RES 21
(D-02-13) 05cac 9130		8/20/2011	1085	9	40		400	121.9				MON	D	PHRES-03
(D-02-13) 05cac 9130		8/20/2011	1145	9	40		460	140.2				MON	D	PHRES-04
(D-02-13) 05cba 9118		4/12/2010	1122	8	1122		255	77.7	4/12/2010			MON	D	HRES-09
(D-02-13) 05cba 9119	54 RESOLUTION COPPOER MINING LLC	10/8/2010	5207	4	5207		1220	371.9	10/8/2010			MON	D	DHRES-07

				CASIN	IG		NON-PU	JMPING WAT	ER LEVEL					
ADWR V CADASTRAL REGIST LOCATION NUMB	TRY	DATE COMPLETED	DEPTH DRILLED (ft, bls) <sup>a</sup>	DIAMETER (inches)	DEPTH (feet)	ALTITUDE OF LAND SURFACE (ft, msl) <sup>b</sup>	DEPTH (ft, bls)	DEPTH (m, bls) <sup>c</sup>	DATE MEASURED	ALTITUDE (ft, msl)	PUMPING RATE (gpm) <sup>d</sup>	WATER USE <sup>e</sup>	LOGS	WELL COMMENTS
(D-02-13) 05cbd 91305	51 RESOLUTION COPPER MINING LLC	8/19/2011	1100	9	60		360	109.7				MON	D	PHRES-02
(D-02-13) 05cca 91305	50 RESOLUTION COPPER	8/19/2011	1160	9	40		260	79.2				MON	D	PHRES-01
(D-02-13) 05ccb 20184	48 RESOLUTION COPPER MINING LLC	3/11/2004	1147	4	1055		321		3/26/2004			MON	D	HRES-05
(D-02-13) 05ccb 61524	43 AZ STATE LAND DEPT,			4										
(D-02-13) 06 21259	92 RESOLUTION COPPER MINING, LLC							1				MIN		ONE OF THESE HOLES ("RES-10") WAS MODIFIED TO A MONITOR WELL (55-213992). SLR 10/12/06
(D-02-13) 06 53268	81 BHP COPPER INC,	8/7/1992										NONE	D	CAP-4-22-92/11-19-91
(D-02-13) 06 55116		3/9/1996						-				NONE	D	4 HOLES:
(D-02-13) 06 55294		6/6/1996										NONE	D	2 HOLES:
(D-02-13) 06 55763	34 BHP COPPER INC,	11/1/1996										NONE	D	3 HOLES:
(D-02-13) 06 56294	41 BHP COPPER INC	12/10/1997					400	121.9				NONE		3 HOLES: abandoned
(D-02-13) 06acc 91295	-		7497	12	7497			-				NONE		RES-25
(D-02-13) 06b 59106	60 RESOLUTION COPPER MINING LLC											NONE		mineral exploration NOI only
(D-02-13) 06bac 91283	73 RESOLUTION COPPER MINING		7497									NONE		RES-25
(D-02-13) 06bba 21715	50 RESOLUTION COPPER MINING, LLC	4/20/2008	5429	5	3369							OME	D	RES-016; WELL CAPPED
(D-02-13) 06bba 5979;	72 RESOLUTION COPPER MINING LLC		5160	5	3235		2500	762.0				Т	D	SLR: THIS WELL WAS ORIGINALLY DRILLED UNDER 55-587214 AS THE SECOND MINERAL EXPLORATION HOLE. SINCE THERE WERE 2 HOLES ASSOCIATED WITH ONE REGISTRATION NUMBER, A NEW NUMBER HAS BEEN CREATED FOR THE SECOND HOLE IN ORDER TO PROCESS THE NOI TO MODIFY. THIS WELL IS NAMED RES-2
(D-02-13) 06bbb 21675	51 RESOLUTION COPPER MINING LLC		7261	10								OME		RES-14; Action History shows NOIs received to abandon and Abandonment Authority Issued. However, this well has not been abandoned. Only the deepened portions of the well have been abandoned when the deepened portion/project was completed 9/6/11 - bew
(D-02-13) 06bbb 22133	31 RESOLUTION COPPER MINING, LLC											NONE		Res 32
(D-02-13) 06bca 5872 <sup>-</sup>	14 RESOLUTION COPPER MINING LLC	9/28/2002		4	5686							Т	D	SLR: TWO HOLES WERE ORIGINALLY DRILLED UNDER THE EXPLORATION NOI: RES-1 AND RES-2, SITES C AND D. THE NOI TO MODIFY BOTH WELLS IS REASON TO CREATE A NEW NUMBER FOR THE SECOND HOLE. THEREFORE, RES-1 IS ASSOCIATED WITH 55- 587214 AND RES-2 IS ASSOCIATED with 55-597972
(D-02-13) 06bcd 91295	53 RESOLUTION COPPER MINING		4367	4	4367		320	97.5				NONE		RES-28
(D-02-13) 06bdb 22133	30 RESOLUTION COPPER MINING, LLC											NONE		RES-31
(D-02-13) 06c 53752	26 MAGMA COPPER CO,	6/9/1993					4667	1422.5	6/9/1993			NONE	D	ABAND-6-16-93; canceled
(D-02-13) 06cba 22133	32 RESOLUTION COPPER MINING, LLC											NONE		Res 33
(D-02-13) 06daa 21675	52 RESOLUTION COPPER MINING LLC											OME		RES-11
(D-02-13) 06dab 21399	92 RESOLUTION COPPER MINING LLC											MON		RES-10; THIS WELL WAS ORIGINALLY DRILLED AS AN EXPLORATION WELL UNDER 55-212592 (1 OF 10 HOLES). OWNER WANTS TO MODIFY ONE HOLE TO BE A MONITOR WELL ASSIGNED TO 55-213992.
(D-02-13) 06dac 21725	58 RESOLUTION COPPER MINING, LLC	4/29/2008	7842	14	7842							OME	D	RES-017; WELL CAPPED
(D-02-13) 06ddb 91210	02 RESOLUTION COPPER MINING LLC	9/30/2010	6320	2	6320							MON	D	DHRES-8
(D-02-13) 07abb 60967	75 INTEGRITY LAND AND CATTLE, LLC		1400	4	1400		300	91.4			35	S		
(D-02-13) 07bab 91296	67 RESOLUTION COPPER MINING LLC	3/6/2011	900	4	900		471	143.6	3/6/2011			MON	D	HRES-13
(D-02-13) 08bab 61524	45 AZ STATE LAND DEPT			4										
(D-02-13) 08cbb 90794		11/28/2007	1455	5	1022		455	138.7	11/28/2007			MON	D	HRES-08
10 02-10/00000 90/9		4/29/2010	2689	5	1635		797	242.9	4/29/2010			MON	D	DHRES-06

<sup>a</sup> ft, bls = feet below land surface <sup>b</sup> ft, msl = feet above mean sea level <sup>c</sup> m, bls = meters below land surface <sup>d</sup> gpm = gallons per minute --- = no available data

e Water Use: D = Domestic I = Irrigation S = Stock MIN = Mining

IND = Industrial MON = Monitoring C = Commercial REM = Remediation R = Recreation NONE = None OP = Other - Production

T = Test

OME = Other - Mineral Explore

f Logs: D = Driller's

# APPENDIX D

# SUMMARY OF WELL RECORDS FROM ADWR GROUNDWATER SITE INVENTORY (GWSI)

#### TABLE D-1. SUMMARY OF WELL RECORDS FROM ADWR GROUNDWATER SITE INVENTORY (GWSI) NEAR WEST TAILINGS PREFEASIBILITY STUDY **RESOLUTION COPPER MINING, PINAL COUNTY, ARIZONA**

					CASIN	G	PERFORA	TIONS	ALTITUDE	ALTITUDE		NON-PU	MPING WAT	ER LEVEL						
CADASTRAL LOCATION	ADWR WELL REGISTRY NUMBER	OWNER	DATE COMPLETED	DEPTH DRILLED (ft, bls) <sup>a</sup>	DIAMETER (inches)	DEPTH (feet)	INTERVAL (ft, bls)	TYPE <sup>b</sup>	OF LAND SURFACE (ft, msl) <sup>C</sup>	OF LAND SURFACE (m, msl) <sup>d</sup>	DATE MEASURED	DEPTH (ft, bls)	DEPTH (m, bls) <sup>e</sup>	ALTITUDE (ft, msl)	ALTITUDE (m, msl)	PUMPING RATE (gpm) <sup>f</sup>	DATE PUMPED	WATER USE <sup>g</sup>	LOGS	REMARKS
(D-01-11) 35dbc	502051	ROSE, R		100	4				2265	690.4	12/15/1997							U		Obstructed at 38.4
(D-01-11) 35dca1					4				2040	621.8	12/4/2002							D, S		Dry
(D-01-11) 35dca2									2040	621.8	2/13/2009	38.7	11.8	2001.3	610.0			D		1982 on pad
(D-01-13) 28ddb1	526592	USFS	4/28/1990	1108	16 10	0-? 0-936	 410-419 850-859	 P P	4076	1242.4	12/14/2006	289.9	88.4	3786.1	1154.0			U		
(D-01-13) 32dcd		MAGMA COPPER COMPANY			2.5				4020	1225.3	11/18/1994	231.9	70.7	3788.1	1154.6			U		
(D-02-11) 01cdc2	627524	HERRON, JAMES		60	4				2420	737.6	2/13/2009	32.2	9.8	2387.8	727.8			I, S		
(D-02-11) 11dab	600808	USFS							2405	733.0	2/13/2009	3.72	1.1	2401.28	731.9			S		
(D-02-12) 03cdd					8 6				2740	835.2	2/11/2009	124.4	37.9	2615.6	797.2			D		
(D-02-12) 07aba	624605	BOYCE TRHOMPSON ARBORETUM	1/1/1925	43	120				2440	743.7	12/8/2009	10.1	3.1	2429.9	740.6			I		
(D-02-13) 07aaa	609675	ASARCO		1400	3.5				4040	1231.4	11/18/1994	461.5	140.7	3578.5	1090.7			U		

<sup>a</sup> ft, bls = feet below land surface

<sup>b</sup> Perforation Type:

<sup>c</sup> ft, msl = feet above mean sea level <sup>d</sup> m, msl = meters above mean sea level <sup>e</sup> m, bls = meters below land surface

f gpm = gallons per minute

--- = no available data

<sup>g</sup> Water Use:

D = Domestic

I = Irrigation S = Stock

U = Unused

P = Perforated or slotted

# APPENDIX E

# DETAILED DESCRIPTIONS OF GEOLOGIC UNITS (from Spencer and others, 1998)

## **APPENDIX E**

# DETAILED DESCRIPTIONS OF GEOLOGIC UNITS (from Spencer and others, 1998)

### Quaternary Alluvial Deposits (Holocene to early Pleistocene)

**d:** Disturbed surficial deposits (Holocene) – Gravel, broken rock and rearranged surficial deposits, generally associated with mining activity.

Qal: Alluvium (Quaternary) – Undifferentiated alluvium

**Qs:** Surficial deposits (Quaternary) – Undifferentiated surficial deposits, generally in mountain areas; includes talus, colluvium and various ages of alluvium.

**Qtc:** Talus and colluvium (late Holocene to Middle Holocene) – Unconsolidated talus and colluvium on slopes. Consists of locally derived angular to subangular cobbles and boulders with variable amounts of sand or mud matrix. Unconformably overlies all older units.

Qyc: Active alluvium (Holocene) – Very young deposits in the channels of ephemeral streams draining piedmonts, mountain areas, and basin floors are labeled Qyc. Qyc deposits are composed of minimally oxidized sand, silt, pebbles, cobbles, and boulders. Qyc deposits are typically coarse and very poorly sorted within mountain areas and on upper piedmonts, with particles ranging from silt to cobbles or boulders; in areas subject to overbank flooding, however, Qyc deposits are primarily sand and silt. Qyc deposits are typically composed of sand, silt, and pebbles on lower piedmonts, and are primarily sand on basin floors. Drainage patterns of Qyc channels are generally dendritic in the mountains and on upper piedmonts. Within the larger Qyc channels and on the lower piedmonts and basin floors distributary and anastomosing channel patterns are common. Many Qyc channels on lower piedmonts have discontinuous entrenched and unentrenched reaches. Some of the Qyc channels on piedmonts have rectilinear drainage patterns that suggest anthropogenic causes, such as railroad tracks, diversion ditches and dams, or channels that have developed out of two-track roads and cattle trails. Most Qyc channels on basin floors have been obscured or obliterated by agricultural cultivation. These former channels are identified by broad, shallow swales and young, sandy soils.

Qyc alluvium is generally well-stratified and lacks any appreciable soil formation. Qyc soils are classified as Torrifluvents or Torriorthents. Most of the channel surfaces are modern in age, but vegetated bars may be several hundred years old. Vegetation tends to be concentrated along modern drainages because of the relatively greater supply of moisture. Some of the larger drainages that originate in the mountains support streamflow in the

mountains and upper piedmont areas during the winter and spring. These drainages may sustain relatively large and lush riparian vegetation, such as cottonwood, sycamore, desert willow and tamarisk. Most Qyc channels on piedmonts only flow during or immediately after rainfall events. These channels typically are lined with palo verde, mesquite, or ironwood. Qyc surfaces are prone to flooding unless structures have been constructed to divert water from them. Areas mapped as Qyc on lowermost piedmonts and basin floors were formerly quite flood prone, but have for the most part been protected by flood-control structures. Due to relatively frequent wetting and high permeability, areas mapped as Qyc have high potential for ground-water recharge.

**Qy:** Low terrace and alluvial fan deposits (Holocene) – Holocene alluvial deposits that have incipient soil development are mapped as Qy. Unit Qy consists primarily of low terraces along active washes in the montane and upper piedmont areas and broad alluvial fans on lower piedmonts. Active channels are also included in unit Qy where they could not be consistently differentiated from slightly older deposits, primarily on active alluvial fans and in some montane stream reaches. In the mountains and on upper piedmonts particle sizes range from fine sand to boulders; on lower piedmonts, sand, silt, and pebbles predominate. Qy deposits typically are associated with narrow stream channels and low terraces on upper piedmonts of the Mesa Quadrangle. Drainage networks on Qy alluvial-fan surfaces on middle and lower piedmonts typically are distributary or anastomosing, with discontinuous entrenched and unentrenched reaches. In upper piedmont and intramontane areas, Qy deposits are associated with dendritic drainage networks. Qy terraces and alluvial fans typically are about 1 to 2 m above active channels.

Qy soils are weakly developed and commonly primary fluvial bedforms are preserved. Pedogenesis is generally limited to surface enrichment of silt from eolian sources, slight oxidation, and weak calcium carbonate accumulation. Surface colors typically are light brown to yellowish brown (10 YR), with minimal reddening deeper in the soil profile. Surfaces have minimal or no rock varnish or desert pavement development. Qy soils contain cambic, calcic (Stage I or less; morphologic stages of calcium carbonate accumulation are after Gile and others, 1981, and Machette, 1985), and Cox horizons [Birkeland, 1984], and classify as Torrifluvents, Torriorthents, Camborthids, and Calciorthids. Based primarily on soil development, Qy surfaces are estimated to be younger than 10 ka. Unit Qy encompasses units Ya, Ya1, Ya1a, and Ya1b of Huckleberry [1992, 1993a, 1993b, 1994a, 1994b]. We correlate Qy deposits with the Q4, Q3c, and Q3b surfaces (< 8 ka) in the lower Colorado River valley (LCR) [Bull, 1991]; and with the Fillmore alluvium (< 7 ka) in southern New Mexico near Las Cruces (SNM) [Gile and others, 1981].

Qy includes many active channels too small to map at this scale, relatively low stream terraces that may be inundated during large floods, and active alluvial fans on the middle and lower piedmont. Due to relatively high permeability and the variable potential forinundation, all areas mapped as Qy should be considered as potentially flood prone unless geomorphologic / hydrologic / hydraulic analyses indicate they are not.

**QI:** Moderately dissected alluvial fan and terrace deposits (Late Pleistocene) – Late Pleistocene alluvial fan surfaces and terraces with moderate soil development are mapped as unit Ql. These deposits are common along mountain streams and on piedmonts. Ql units are typically alluvial fans on middle and lower piedmonts and terraces on upper piedmonts and in mountain areas. Alluvial sediment sizes range from sand to cobbles and boulders, coarser in upper piedmont and mountain areas. Drainage patterns on Ql surfaces are dendritic, with surface dissection varying from about 1 to 4 m. Desert pavement and rock varnish development is quite variable, ranging from nonexistent to moderate. Subdued depositional bar-and-swale surface topography is common.

Ql soils are more strongly developed than Qy soils, but their characteristics vary substantially. Ql surface colors typically are similar to or slightly redder than Qy surfaces (light brown to reddish yellow). Ql soils commonly contain argillic horizons (zones of clay accumulation) that are weakly to moderately strongly developed. These upper horizons of Ql soils are slightly (strong brown, 7.5 YR) to obviously (yellowish red, 5 YR) reddened relative to their parent material. Calcic horizon morphologies are also quite variable, ranging from Stage I-III development. Ql soils classify as Haplargids, Camborthids, and Calciorthids.

Unit Ql includes deposits of several different ages, probably ranging from slightly greater than 10 ka to as much as 100 to 200 ka. Unit Ql is equivalent to unit Ma2 of Huckleberry [1992, 1993a, 1993b, 1994a, 1994b]. We correlate Ql deposits with the Q2c (12-70 ka) and Q2b (70-200 ka) surfaces of the LCR [Bull, 1991] Isaac's Ranch (8-15 ka) and Jornada II (25-125 ka) surfaces of the SNM [Gile and others, 1981]. The substantial time span covered by unit Ql helps to explain the considerable morphological variability displayed by Ql soils. All Ql soils have developed at least in part during times when the regional climate was wetter and cooler than the Holocene, but the oldest soils may be an order of magnitude older than the youngest soils. Although well developed, none of these soils have not yet reached the stage of pedogenic development when subsequent soil formation is impeded by plugged and indurated horizons. These late Pleistocene soils thus display greater morphological variability compared to older soils with strong argillic horizons or petrocalcic horizons.

Ql units generally are not flood prone, except immediately adjacent to active washes. In lower piedmont areas where topographic relief is minimal, some areas mapped as Ql may be subject to inundation during extreme floods or may become subject to inundation as a result of relatively minor changes in the stream systems. Areas mapped as Ql generally have low recharge potential because their soils have generally low permeability and they are isolated from major washes.

**Qm:** Dissected alluvial-fan and terrace deposits (Middle Pleistocene) – Dissected middle Pleistocene alluvial-fan and terrace deposits with strong soil development. Relict Qm alluvial fans cover much of the middle and upper piedmonts throughout the Mesa Quadrangle. Small Qm fans and terraces are also fairly common along streams and in small basins in mountain areas. Sediment grain sizes range from sand to boulders, fining downstream. Qm alluvial-fan surfaces typically have dendritic drainage and are heavily dissected by streams that head on

them. Qm surfaces typically are 2 to 10 m above modern channels, with dissection decreasing downslope as Qm surfaces converge with younger surfaces. Desert pavement and rock varnish development are typically strong on stable Qm surfaces, but may be variable or weak on surfaces that have experienced significant erosion.

Qm soils typically exhibit strong soil development. Surface color range from strong brown to reddish brown. Qm soils typically contain reddened argillic horizons (strong brown to yellowish red, 7.5 YR to 5 YR) that are moderately to strongly enriched in pedogenic clay. Calcic horizon development typically is fairly strong (Stage II-IV); some Qm units have petrocalcic horizons (caliche). These soils classify as Calciorthids, Paleorthids, Haplargids, and Paleargids.

Estimated age of Qm deposits is at least 250 ka, and more likely 500 to 700 ka. Unit Qm is equivalent to unit Ma1 of Huckleberry [1992, 1993a, 1993b, 1994a, 1994b]. Soils associated with the Qm unit are much more strongly developed than those associated with Ql, implying that Qm is substantially older than Ql. The Qm unit is correlated with Q2a surfaces (400-700 ka) of the LCR [Bull, 1991] the Jornada I (250-400 ka) and possibly Doña Ana (> 400 ka) surfaces of SNM [Gile and others, 1981].

Areas mapped as Qm are generally not flood prone except in and adjacent to washes. Because of their relatively impermeable argillic and petrocalcic horizons, Qm surfaces are not areas of significant ground-water recharge.

**Qml:** Middle alluvium, undifferentiated (Late Pleistocene to Middle Pleistocene) – Composite map unit that contains both middle Pleistocene (Qm) and late Pleistocene (Ql) terrace and alluvial-fan deposits. Qml is used in montane areas that were mapped on a reconnaissance basis. In these areas, it is difficult to confidently distinguish between middle and late Pleistocene terraces without extensive field investigations and soil descriptions. Areas mapped as Qml are not prone to flooding except in and immediately adjacent to washes, and they are not areas of significant recharge.

**Qo:** Deeply dissected alluvial-fan remnants (Early Pleistocene) – Deeply dissected remnants of very old Quaternary alluvial fans with strong soil development are mapped as Qo. These relict alluvial fans exist in some upper piedmont areas in the south-central and eastern parts of the Mesa Quadrangle. Qo surfaces commonly are deeply dissected into a series of alluvial-fan remnants that mark the highest stand of basin deposits along the upper piedmont. Qo surfaces typically are 6 to 25 m above modern channels. Older deposits underlying and downslope from preserved Qo surfaces are mapped as Tertiary basin-fill deposits (Ts). In the eastern quarter of the Mesa Quadrangle, however, basin-fill deposits exist at levels substantially higher than Qo surfaces. Qo deposits typically are coarse and very poorly sorted, with grain sizes ranging from sand to boulders. Desert pavement on Qo surfaces varies from none to moderate; rock varnish varies from none to strong.

Qo soils range from moderately to very strongly developed, depending on their preservation. In areas where fairly extensive Qo surfaces are preserved, Qo soils typically include reddish brown to red (5 YR to 2.5 YR), clay-rich argillic horizons and petrocalcic horizons (caliche; Stage III-V). In areas where Qo remnants are of limited extent, or on slopes below planar fan surfaces, argillic horizons may have been removed by erosion leaving a calcic or petrocalcic horizon and caliche fragments at the surface. Qo soils classify as Paleargids (well-preserved argillic horizons), Durorthids, and Paleorthids. The common presence of petrocalcic fragments on Qo surfaces indicates erosion or bioturbation of the original surface.

Age of Qo alluvium is estimated to be 1 to 2 Ma. Unit Qo is generally equivalent to unit Oa of Huckleberry [1992, 1993a, 1993b, 1994a, 1994b]. However, unit Qo is somewhat more restricted than unit Oa because it includes only those areas where some remnant of the original alluvial-fan surface is preserved; if no planar fan surface is preserved, deeply dissected surficial deposits are inferred to be of Tertiary age (unit Ts). Qo correlates with the Q1 surface in the LCR [Bull, 1991] and possibly the Doña Ana surface of the middle Rio Grande Valley [Gile and others, 1981]. Both of these surfaces have open-ended age estimates (> 1.2 Ma for Q1 and > 400 ka for Dona Ana). Qo also correlates with the Martinez surface [Menges and McFadden, 1981; Morrison, 1981], a very high alluvial surface common to the basins of southeastern Arizona. Menges and McFadden [1981] estimate the age of the Martinez surface as 1-3 Ma based on very strong soil formation and magnetostratigraphy of underlying sediments.

Areas mapped as Qo are not flood prone. Impermeable argillic and petrocalcic horizons and relatively steep slopes associated with unit Qo limit the amount of groundwater recharge in these areas.

**QTI:** Landslide deposits (Holocene or Pliocene) – Poorly consolidated to unconsolidated, very poorly sorted mud to large boulders, characterized by a hummocky surface littered with boulders. Foliation in boulders of foliated rock varies greatly between outcrops. Contacts of landslide deposits range from sharp to gradational.

### **Tertiary Sedimentary Rocks (Miocene)**

**Tcu:** Conglomerate (Miocene) – Conglomerate units overlying Miocene volcanic rocks in the Superior Quadrangle. In the Superior Basin, rocks included in this unit are moderately to well indurated conglomerate consisting of sub-rounded to subangular cobbles to boulders. Sparse planar sandy pebble to cobble conglomerate beds and, near the base of the unit, tuffaceous sandstone beds define bedding orientation. Underlies deeply (5-10 m) incised surfaces, which are littered with boulders weathered from the deposit. Largest boulders are up to about 2 m in diameter. Clasts consist of Pinal Schist, various granitoids (Yr, XYg), Apache Group, Paleozoic carbonate and clastic strata, massive white vein quartz, and Tertiary volcanic rocks.

**Tsu:** Sandstone (Miocene) – Tan to pale brown, poorly sorted and poorly bedded medium to fine grained sandstone. Overlies basalt (Tb) depositionally. Sandstone grades stratigraphically upward into conglomerate of map unit Tcu; contact placed where conglomerate constitutes greater than 50% of outcrop.

**Tsl:** Sedimentary rocks, Clastic (Miocene to Late Oligocene) – Pre-volcanic clastic rocks in central Arizona have been previously included in the Whitetail Formation [Ransome, 1904]. In view of the fact that the namesake location is now labeled Eastwater Canyon on published maps, a type section was never defined, the original type area is now buried by dumps at the Pinto Valley Mine, and that the age and correlation of various pre-volcanic clastic units called Whitetail is uncertain, the name is not used here. The thickest and most extensive accumulation of pre-volcanic clastic rocks is preserved in a dismembered basin above the Grayback Normal fault [Richard and Spencer, 1998] in the area north and west of the Ray Mine. This sequence consists mostly of massive conglomerate, but also includes mudstone, evaporite, and sandstone. The basal part of the section is generally massive conglomerate to sedimentary breccia, composed of clasts from adjacent underlying rock units. Rock avalanche deposits are present near the base of the section in several areas (e.g. Tx units in Tsl along Mineral Creek north of the Ray Mine). West of the Ray Mine in Walnut Canyon, the base of the section is massive, angular clast conglomerate consisting of clasts of Pinal Schist. The matrix is lithic sand to mudstone, apparently composed of disaggregated Pinal schist. The conglomerate is matrix or clast supported, and weakly to moderately indurated. Blocks of schist are up to about 3 m in diameter. These deposits are interpreted to include talus, coarse alluvium and debris flow deposits. In this area, the contact with underlying Pinal Schist gradational through shattered schist and is commonly faulted. Monolithologic sedimentary breccia-type conglomerates typically grade up into massive conglomerate with more rounded clasts derived from a variety of sources. In some areas, different facies of conglomerate can be mapped based on predominant clast types. Bedding in the conglomerate is difficult to discern except in sparse sandstone lenses. Fine grained facies of this sequence have been described from the southern part of the outcrop area. Light gray to red brown laminated mudstone is interbedded with very thin beds of fine-grained sandstone and lenses of pebble to cobble conglomerate. Some conglomerate lenses consist entirely of angular clasts of Pinal Schist; others contain granite (Yg and TKtc), Pinal Schist, and carbonate or quartzite clasts from the Apache Group or Paleozoic section. Gypsum and halite(?) are very thinly interbedded with buff siltstone to mudstone. Outcrops of evaporitic mudstones are highly disrupted because of mobility of anhydrite and salt, and original sedimentary structures have not been observed. The detailed relationship between the various facies is unknown.

#### **Tertiary Volcanics (Middle Miocene to Early Miocene)**

**Tt: Poorly welded tuff** (Miocene) – Massive to well bedded, non-welded to poorly welded tuff of uncertain affinity. Typically very light gray or white color. Crystal and lithic content variable. Tuff along northeast side of Superior Basin includes some Apache Leap Tuff.

**Tfp:** Felsic volcanic rocks (Miocene) – Felsic lava flows with associated vitrophyre, autobreccia, and tuff. Colors vary from dark gray to black for massive vitrophyre to white, light gray, or yellow in devitrified or deuterically altered parts of flows. Flow banding, amygdules, and brecciated zones are common. Rocks typically have phenocrysts of quartz, two feldspars, and sparse biotite or hornblende; tiny magnetite crystals are a common accessory. Quartz ranges from euhedral to resorbed. Phenocrysts make up to ~40% of rock in some units. Contacts with associated hypabyssal intrusions or endogeneous dome complexes are difficult to locate. Chemical analyses in Creasey et al., 1983 indicate the lavas in the western part of the map area are rhyolite. Interbedded with associated pyroclastic 37 deposits of unit Ttw, and intruded by hypabyssal rhyolite of unit Tfpi. Overlain by conglomerate (Ts).

**Tfpt: Tuffs** (Middle Miocene to Early Miocene) – Thin to thick tuff beds, locally with interbedded conglomerate. Tuffs are generally moderately to well indurated, but non-welded. Stratigraphic sequences vary in different parts of the map area. East of South Butte the sequence of tuffs includes: (1) a crystal rich tuff bed containing <2 mm-diameter biotite, quartz, feldspar, and hornblende(?) crystals, numerous pumice fragments that weather to form 1-5 cm pits on outcrop surfaces due to preferential weathering, and moderately abundant volcanic lithic fragments with a diameter of <1 cm; and (2) a tuff containing 1% 1-2 mm-diameter biotite crystals, abundant <3 mm-diameter quartz and feldspar crystals, and 10-20%, 1 3 cm volcanic-lithic fragments.

Extensive exposures of tuff 1.5 miles southeast of South Butte are mostly massive, with thin, well bedded intervals. This tuff is white, weathers orangish brown, contains sanidine, 5-10% quartz, and <1% biotite. Prominent cooling breaks are thin (2-10 cm) intervals of very thinly bedded to laminated tuff that weather to form ledges. At the southern end of the tuff outcrop area near upper Donnelly Wash, tuff contains fresh biotite, quartz, and granitoid lithic fragments. West of Box O Wash in this area, tuff contains 1-2 mm phenocrysts of quartz and biotite with sparse xenocrysts(?) of K-feldspar(?) up to 5 mm diameter. Directly south of Cochran massive, orange-weathering, volcanic lithic tuff(?) forms bold, rounded outcrops and contains abundant 2-20 cm fragments of variably flow-banded rhyolite with sparse quartz and sanidine crystals <3 mm in diameter. Biotite from tuff west of Box O Wash yielded a K-Ar date of  $19.5\pm0.4$  Ma [Damon et al., 1996].

In the area southwest of the Ray Mine, tuff included in this unit has been named tuff of White Canyon [Dickinson, 1995]. The unit consists of white to light gray, very thin- to thinbedded tuff that contains 1-2 mm crystals of quartz, feldspar, and minor biotite and magnetite in a fine-grained ash matrix. Sparse 1-3 cm lithic fragments are present. Little or no evidence of reworking after deposition is reported. Sparse conglomerate horizons are present near the base. Tuff forms resistant mesas and ridge tops. Equivalent to older tuff (Tto) of Creasy, et al. [1983]. Tuffs generally form the base of the section of Picketpost Mountain volcanics, overlying Pinal Schist, Apache Group, Tertiary conglomerate (unit Tsm), basalt lava (Tb) or Apache Leap tuff (Tal). Basal contact on Pinal Schist is erosional unconformity with significant relief; contact on Tertiary units is typically a disconformity, but locally is an angular unconformity.

Tb: Basaltic rocks (Middle Miocene to Early Miocene) – Basalt lavas that are interbedded with middle Tertiary volcanic rocks. In the Teapot Mountain Quadrangle consists of dark gray basalt, basaltic or ande-site lava flows, typically vesicular, and associated with red, scoriaceous deposits. Purplish to green-ish gray, aphanatic to very fine-grained amygdaloidal basalt lava flows; consists of a mat of tiny (~0.015 mm) plagioclase needles, magnetite, and alteration products comprising carbonate, epidote, chlorite, clay, and hematite. Basalt lava flows and flow breccias near Queen Creek in the southern Picketpost Mountain quadrangle are dark gray and very fine-grained with 2 4% 1 mm diameter crystals of olivine (altered to iddingsite) and greenish pyroxene, in varying proportions. Flows are 1-4 m thick and locally vesicular; thin autobreccia zones are exposed at the base of some lava flows. Basalt forming Hackberry and Black mesas in the northern Superstition Mountains is very fine-grained, dark grey to black and contains 1-2 mm phenocrysts of clear plagioclase, olivine (locally altered to red iron oxides), and rare clear nepheline. In the Santan Mountains the unit consists of crystal-poor basalt lava flows, containing subhedral olivine phenocrysts up to 6 mm wide (altered to red opaques), dark green pyroxene and clear plagioclase laths up to 2-3 mm in diameter. The flows are locally brecciated and commonly vesicular. The sequence of lava flows is over 100 meters thick, and forms cliffs and steep, talus-covered hills. To the east the flows are thinner and interbedded with sedimentary rocks (Tsm). Mostly conformably overlies or interbedded with conglomerate (Tsm), overlies Apache Leap Tuff in northern Superstition Mountains.

**Trdu: Undifferentiated felsic lava** (Middle Miocene) – Includes lavas that resemble unit of Whitlow Canyon and unit of Buzzards Roost, as well as other unclassified lavas and some pyroclastic rocks.

Trdt: Tuff (Early Miocene) – Tuffs associated with undifferentiated felsic lava (Trdu).

**Tal: Apache Leap Tuff** (Early Miocene) – In typical, well exposed sections, a basal white non-welded to partly welded tuff (0-45 m thick) grades up section with increasing welding to black vitrophyre (1.5-15m thick); Vitrophyre isoverlain by densely welded tuff; degree of welding decreases up section to poorly welded or locally non-welded at top. Tuff is crystal rich, with 35-45% phenocrysts of plagioclase (2-4 mm diameter, 24-32%), quartz (2-3 mm, 4-6%), biotite (1-3 mm, 3-5%), sanidine (2-3 mm, trace to 2%), hornblende (1 mm length, 0-1%), opaque oxide « 1 mm, trace- 2%). Accessory sphene is commonly discernible with a hand lens; zircon and apatite are also present. Plagioclase is typically subhedral, twinned and zoned, and is andesine or oligoclase. Quartz phenocrysts are rounded and deeply embayed. Biotite is euhedral to subhedral in thin books and flakes. Plagioclase decreases in abundance up section, while quartz and sanidine increase up section. Fiamme area strongly flattened, nearly invisible in the lower, strongly welded parts, and become more equant, only slightly flattened in the upper part. Fiamme are generally sparse. The lower, strongly welded parts are medium reddish brown in color, and the color lightens up section with decreasing welding.

Zones of vapor-phase alteration tend to be light gray in color. Overlies all older units with slight to strong angular unconformity on a surface of moderate relief. In several areas the contact is moderately to steeply tilted along faults that were apparently active during eruption. Contacts on Whitetail conglomerate are generally concordant, and appear conformable. (Richard and Spencer, 1998).

**Tev:** Volcanic rocks (Early Miocene) – Unit consists of undiffentiated volcanic rocks that underlie the Apache Leap Tuff in the Superior and Haunted Canyon Quadrangles [Peterson, 1960; 1969]. In the Superior quadrangle, these are described as lava flows ofrhyolite and perlitic obsidian. The rhyolite is light gray, flow banded or massive, and contains 1-5% phenocrysts of plagioclase, quartz, sanidine and biotite in an aphanitic groundmass. Black or brown perlitic vitric zones are common at the top and bottom of lava flows. The unit includes some tuff and tuff breccia, and flows of andesite and trachyte. In the Haunted Canyon Quadrangle the unit consists of rhyolitic lava flowsand associated pyroclastic and epiclastic rocks that have not been described. Overlies Whitetail conglomerate conformably, overlies pre-Tertiary rock on erosional unconformity with significant relief. Overlain by Apache Leap Tuff.

### Tertiary and Cretaceous Intrusive Rocks (Miocene to Late Cretaceous)

**Tg2:** Granitoid stock of Wood Camp Canyon (Miocene) – Fine grained aplitic to granophyric granite with a groundmass consisting of 40% quartz and 60% feldspar; rock contains 2-3 mm diameter quartz phenocrysts, 4 mm long blocky K-feldspar phenocrysts and 1-2 mm anhedral plagioclase grains altered to chalky clay or sericite. Biotite, in 1 mm diameter books, is present in tract amounts. Contact with Pinal Schist is well exposed in Reavis Trail canyon at the south end of the pluton. The contact is sharp with a few thin dikes of granite cutting the schist. Pinal Schist is converted to hornfels within about 10 m of contact.

**TKpg: Porphyry of Government Hill** (Late Cretaceous or Paleocene) – Light brown to paleyellowish brown quartz monzonit porphyry. Phenocrysts of euhedral plagioclase, perthitic K-feldspar, and anhedral quartz are set in a very fine-grained groundmass of quartz and feldspar. Accessory minerals included biotite, epidote, magnetite, sphene, and apatite. Phenocrysts average 3-5 mm in diameter, largest are 10 mm in diameter. Quartz phenocrysts are deeply embayed, some with recrystallized grain margins. Alteration is extensive; plagioclase is albitized, biotite bleached, and secondary epidote, chlorite, and iron oxides are abundant. Miiarolitic cavities lined with epidote crystals are present, rarely these contain a single euhedral quartz crystal. Resistant to weathering, and forms steep slopes and cliffs. Intrudes Pinal schist and Apache group; overlain depositionally (and intruded?) by pre-Apache Leap Tuff felsic lavas.

Kqd: Quartz diorite of Peachville Wash (Late Cretaceous) – Medium to fine-grained, generally hypidiomorphic or panidiomorphic granular quartz diorite. Consists mostly of

euhedral to subhedral plagioclase and variable amounts of euhedral hornblende, pyroxene, and bioitite; interstitial quartz ranges from trace to 15%. Includes two major rock types with gradational contacts. One is medium grained and contains 10-20% mafic minerals and 10-15% quartz. The other is fine-grained and ocntains 20-40% mafic minerals and trace to 10% quartz. Irregular masses of coarse grained rock containing euhedral hornblende up to 4 cm long or euhedral pyroxene up to 2 cm in diameter. Plagioclases slightly to moderately altered to sericite and clay; mafic minerals are altered to uralite, epidote, biotite and chlorite. Intrudes Pinal Schist, Apache Group and Paleozoic strata; overlain disconformably by Whitetail formation (Unit Tsl) and volcanic rocks.

### Paleozoic Rocks

**Pn:** Naco Formation (Pennsylvanian) – Gray, blue-gray, tan and yellowish gray finegrainedlimestone in 1.5-3 m-thick beds, interbedded with gray, pink and olive marl and shale. Limestone forms prominent, ledgy outcrop. Shaly units form swales between limestone ledges. Some beds are quite fossiliferous with a variety of brachiopods, corals, and bryozoan.

**Ms:** Sedimentary rocks (Mississippian, Devonian, and Cambrian) – Undifferentiated Bolsa Quartzite, Martin Formation and Escabrosa Limestone.

**Bolsa Quartzite:** Maroon-gray feldspathic sandstone. Grit and pebble conglomerate at the base grade up into medium- to fine-grained sandstone with siltstone partings up section. Planar tabular cross beds are common in quartzite beds in the lower part. Brick-red to light gray, fine- to medium-grained, well sorted and bedded sandstone. Abundant iron oxide gives rock red color. Commonly preserved in channels cut into underlying rock units. Lithologic distinction from Troy quartzite is cryptic; depositional contact on top of diabase is only sure way to distinguish units. Contact with Martin formation is abrupt transition to carbonate deposition.

**Martin Formation:** Brown, gray and tan dolomite and dolomitic limestone; chocolate brown sandy dolomite at the base; one or two coarse poorly-sorted sandstone beds are present; carbonate beds are laminated, massive and mottled. Gray carbonate units commonly have a petroliferous smell on fresh surfaces. Keith [1983] describes three units in the Martin Formation of the Teapot Mountains area, consistent with the measured section in Creasey et al. [1983]. The upper unit is a slope-forming thin- to medium-bedded fine-grained orange-tan silty dolomite with interbedded siltsone and shale; contains scattered hematite concretions and some corals. The middle unit consists of 30-50 feet of ledge-forming, fossiliferous, dark gray thin- to medium-bedded sandy limestone with corals, bryozoa, and abundant brachiopods and crinoid columnals. The sandy limestone overlies about 200 feet of slope-forming light gray to yellow gray thin bedded aphanitic dolomite and limestone. The lower unit consists of 20-35 feet of dark gray, medium-bedded, laminated, fetid dolomite. A basal sandstone, 0-40 feet thick,

correlated with the Becker's Butte Member of the Martin Formation is locally present. This sandstone is friable, well sorted, medium- to coarse-grained quartz arenite.

**Escabrosa Limestone:** Gray to blue-gray massive crystalline limestone in beds up to 3 m thick. Crinoid columnals abundant; corals abundant in some beds. Forms prominent, cliffy outcrops. Some parts contain abundant chert. Black chert bands prominent near base of formation. Minor interbedded silty or marly limestone. Top is variably developed karst zone with clasts of limestone in a red-brown clay matrix. Keith [1983] describes an upper unit he named the Eskiminzin formation that overlies karsted horizon at the top of the Escabrosa Limestone; this unit (0-110 feet thick) consists of pink to yellowish orange unfossiliferous fine-grained to aphanitic dolomite. Disconformably overlies Precambrian rocks, typically on a deeply weathered zone. Unconformably on Proterozoic diabase (Ydb) or Troy Quartzite. Upper contact with Naco formation is subtle change to more ledgy outcrop; when well exposed, a basal chert-pebble breccia is reported to be present at the base of the Naco Formation.

**Cb:** Bolsa Quartzite (Middle Cambrian) – Maroon-gray feldspathic sandstone. Grit and pebble conglomerate at the base grade up into medium- to fine-grained sandstone with siltstone partings up section. Planar tabular cross beds are common in quartzite beds in the lower part. Brick-red to light gray, fine- to medium-grained, well sorted and bedded sandstone. Abundant iron oxide gives rock red color. Commonly preserved in channels cut into underlying rock units. Lithologic distinction from Troy quartzite is cryptic; depositional contact on top of diabase is only sure way to distinguish units. Contact with Martin formation is abrupt transition to carbonate deposition.

### Middle Proterozic Rocks

**Yad:** Apache Group, Troy Quartzite and Diabase (Middle Proterozoic) – Undifferentiated Apache Group, Troy Quartzite, and intrusive diabase (Yd).

**Yd: Diabase** (Middle Proterozoic) – Dark grey dikes with typical sub-ophitic, diabasic texture. 35-45% 1-3mm plagioclase lathes in black groundmass of pyroxene; accessory magnetite(?) is common. Locally crude layering is defined by variation in ratio of plagioclase to groundmass and in size of plagioclase crystals. Intrudes Proterozoic granitoid, Pinal Schist, Apache Group, and Troy Quartzite.

**Ya: Apache Group** (Middle Proterozoic) – Undifferentiated Mescal Limestone, Dripping Spring Quartzite, Pioneer Formation, and basalt of Apache Group. May include minor amounts of Proterozoic Diabase (Unit Yd). Non-conformably overlies Pinal Schist (Xp), and Early or Middle Proterozoic granitic rocks.

**Mescal Limestone** (Middle Proterozoic) – Mescal Limestone (Middle Proterozoic) – Medium-bedded, tan to white dolomite or limestone, locally very cherty. Basal units of

poorly sorted quartz sand in argillaceous or dolomitic matrix; sedimentary breccia deposits related to solution of evaporite minerals present in many areas. This is overlain by thin- to thick-bedded dolomite or limestone, with variable amounts of chert as bedding parallel stringers, and calcareous shale partings. Dolomite is tan, limestone light gray to white. These strata are ordinarily 150-200 feet 45 thick, and form most of the formation. A middle member of massive dolomite or limestone with structural features attributed to the growth of algal colonies during deposition is present in well preserved sections. An

upper member of chert, feldspathic siltstone, and thin limestone is preserved in some areas. Light-gray, yellowish-gray and white medium to coarse-grained crystalline dolomite, some limestone in upper part of section; well, bedded, with beds 0.3 to 0.6 m thick. Chert is found in lenses, irregular globs and laminations. Rock with laminated chert weathers to form ribbed outcrops. Commonly intrudednby diabase sills (Y db). Conformably overlies Dripping Spring Quartzite; conformably or disconformably overlain by basalt (Yb) or Troy Quartzite.

Dripping Spring Quartzite (Middle Proterozoic) – Upper unit (Middle Proterozoic) – Reddish brown to brownish red, thin bedded to laminated siltstone and very fine grained sandstone that readily parts along bedding planes. Locally the middle part is a black, laminated argillite. Some red-brown units contain 1-2cm diameter light tan or gray reduction spots, similar to those in the Pioneer Formation, but in the upper Dripping Spring, the spots tend to be larger in diameter and less abundant than in the Pioneer. Lower unit (Middle Proterozoic) - Tan to pink, medium to thin bedded feldspathic quartz arenite or feldspathic quartzite. Low- to moderate-angle trough cross beds are common. Ranges from coarse- to fine-grained, forming a fining upward sequence. In western exposures (west of Hewett Canyon) basal 5-10 meters consists of pale orange, medium to coarse grained, well bedded, partially cross bedded (10-40 cm thick cross bedded beds) quartzose sandstone with sparse, typically isolated quartzite pebbles and cobbles up to 5 cm diameter. Local pebble beds contain subrounded to rounded clasts of bull quartz, tan to brown quartzite, red jasper(?), and, possibly, brown silicic metavolcanic rocks. Prominent bluffs form top of this unit in Whitford Canyon. Barnes conglomerate; typically shattered in Millsite-Hewett canyon area.

**Pioneer Formation** (Middle Proterozoic) – Reddish brown to dusky purple sandstone, siltstone and minor shale; light gray to white reduction spots are characteristic. In this area, 10-20% of unit is red-brown arkosic fine-grained sandstone. Uppermost part is gray on fresh surface, brown weathering fine- to very fine-grained, almost porcelaneous sandstone. Most of formation is slope-forming. Overlain disconformably by Barnes Conglomerate of Dripping Spring Quartzite; contact is sharp. Non-conformably overlies Madera diorite or Pinal Schist.

**Yg2: Porphyritic biotite granite** (Middle Proterozoic) – This granite is probably equivalent to the type Ruin Granite exposed at the northeastern corner of the map area. The massive granite in upper Horrel Creek (Haunted Canyon 7.5' quadrangle) is described as consisting of euhedral pink K-feldspar phenocrysts 2-8 cm in diameter in a coarse-grained,

hypidiomorphic-granular groundmass of sodic plagioclase, microcline, quartz, and biotite, with accessory sphene, magnetite, apatite, and zircon. This granite locally grades to finegrained, non-porphyritic quartz monzonite. Scattered pods of aplite and graphic granite are present [Peterson, 1960]. Depositionally overlain by Apache Group in northeastern part of outcrop area. Intrusive contacts with older rocks are not well described.

### Early Proterozic Rocks

**Xgd:** Granodiorite to granite (Early Proterozoic) – This unit consists of compositionally variable, generally equigranular and fine- to medium-grained quartz diorite, monzodiorite, granodiorite and granite. Granitoids in this unit have concordant to sub-concordant contacts with Pinal Schist, and range from massive to strongly foliated. Foliation commonly best developed near contacts with Pinal Schist, and all foliation is typcially concordant to that in associated Pinal Schist.

In the northern San Tan Mountains consists of medium-grained equigranular granodiorite, granite, and quartz monzodiorite that contains abundant unaltered plagioclase, 5 15% biotite and rare hornblende. Characteristally contains numerous preferentially oriented, elongate enclaves (1's to 10's of meters) of Pinal Schist, and east-northeast trending epidotized, thin mylonite zones. Foliation becomes pervasive in the northeasternmost exposures. Small irregular bodies of diorite and monzodiorite are present, and are interpreted to be phases of the granodiorite [Ferguson and Skotnicki, 1996]. The mafic phases form dark, rounded hills with crumbly rock exposures, commonly on the low flanks of large hills underlain by granodiorite.

In the east-central part of the Mesa 30 by 60' quadrangle the unit consists of equigranular, unfoliated, medium- to fine-grained granite to granodiorite with local marginal aplitic zones. The rock generally contains 7-10% mica, including both biotite and muscovite, but their relative abundance varies greatly. More muscovite-rich granite, appears to have assimilated more Pinal Schist and is generally associated with gradational assimilation zones and broader contact aureoles. Rocks included in this unit have been mapped as Madera Diorite by Peterson (Superstion Wilderness), Creasey et al. [1983], and S. B. Keith [1983]. Intrusive contacts with Pinal Schist range from sharp contact with few screens of schist near the contact, and no apparent contact metamorphic aureole to heterogeneous mixed zones several 10's of m wide. In many places, the granitic rocks are foliated near contacts.

**Xp: Pinal Schist** (Early Proterozoic) – Several lithofacies are recognized, including: (1) pelitic facies consisting mostly of fine to very fine grained muscovite-biotite-chlorite-quartz-feldspar schist and phylllite; (2) psammitic facies, consisting mostly of fine-grainedquartz-feldspar granofels and gneiss, with sparse mica; (3) calc-silicate gneiss, consisting of hornblende-epidote-calcite-quartz-feldspar gneiss and grano¬fels, ranging from massive amphibolite to marble; and (4) quartzite, consisting of massive gray to black quartzite, commonly ferruginous. The pelitic and psammitic facies are the dominante

lithofacies. Metamorphic grade appears to be middle to lower greenschist facies. Metamorphic muscovite and biotite are abundant, but garnet, staurolite(?) and aluminosilicate (?) minerals have only been observed in contact aureoles near large Middle Proterozoic (?) plutons. The schist becomes medium-fine to fine grained in contact aureoles around concordant to slightly discordant plutons of granite to hornblendite (Xgd, Xd, Xh). Intruded by Early (?) Proterozoic and younger plutons; overlain non-conformably by Middle Proterozoic Apache Group and younger strata. The Pinal Schist is the oldest rock recognized in central Arizona.

**Xpc:** Calc-silicate and amphibolite facies (Early Proterozoic) – Consists of interlayered amphibolite, marble, and psammite. Amphibolite is dark greenish gray, fine-grained amphibole-plagioclase rock. Marble iswhite, pinkish or tan, and occurs as discontinuous layers and irregular lenses in amphibolite or psammite. Unit is >50% amphibolite and marble. Grades into psammitic or pelitic Pinal Schist.

**Xpp: Phyllite facies** (Early Proterozoic) – Massive, platy, gray to silvery gray, slightly schistose phyllite forms concordant band across outcrops of more psammitic schist northeast from Gonzales Pass to Queen Creek. Sparse calc-silicate granofels consisting of fine-grained calcite-epidote-mica is associated with the phyllite.

APPENDIX F

WELL RECORDS

55-514505 (D-1-11)35ddc

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LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0		fi11
15	100	sand gravel and houlders
		water @ 65' & 80'

I hereby certify that t is well was drilled by me (or under my supervision), and that each and all of the statements herein contained are true to the best of my knowledge and belief.

Driller / Che, Dance
Name O
MICKEA DUNGAN
Address
508 N. 104 th Place
CitXpache JState Arizona 852201
Date

55-562908 (D-1-12)26aac

# LOG OF WELL

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knowledge and beli	s well was drilled b of.	y me (or under my supervision), and that each and all statements herein contained are true to the best of
2		Driller's Name (Qualifying Party): New W Lewis
		Box 1043
		Street Avpaul At 85532
		City 520-425-3762 State 6-16-98 Phone Number Date

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### Well Driller Report and Well Log

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### DHRES-09

WELL REGISTRATION NUMBER 55 - 912289

	M SURFACE	Description	Check (T) every interval where water
FROM (feet)	TO (feet)	Describe material, grain size, color, etc.	was encountered (if known)
0	440	Diabase	
440	900	Dripping springs quartzite	
<b>90</b> 0	2040	Diabase	
040	2060	Dripping springs quartzite	
060	2070	Fault breccia	
070	2175	Pinal Schist	

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DWR 55-55 (REVISED 03/07/06) PAGE 3 OF 4

55-501253 (D-1-12)27aad

### LOG OF WELL

Indicate depth at which water was first encountered, and the depth<sup>5</sup> and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

FROM (FEET)	TO (FEET)	DESCRIPTION OF FORMATION MATERIAL
0	33	Existing drilled hole
.33	40	Loose Creek Rock (with water) Unable to drill deeper due to broken drill steel left in well by previous well
40		Unable to drill deeper due to broken
		drill steel left in well by previous well
		driller.
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I hereby certify that this well was drilled by me (or under my supervision), and that each and all of the statements herein contained are true to the best of my knowledge and belief.

Driller Errol. A. Smith Name F.O. BOX 2185 Address Date Globe, AZ 85501

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HURON DRILLING INC.		NC. DR	LLERS					PAGE NO.				
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LOG OF WELL MCC - 3

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Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

To (feet)	Description of formation material
15	Fill - tailings
28	Allurium - Silty SAND & Clayer SAND, gray brown.
-56-	taite constances Sunty SILT, with Chy binfor
	Some angular to sutrounded fragments of Timestone, 1.4 ht
	RYAH
	Perchen which encountered at 23 Feet, Thickness of
	bed about 3-5 feet
56	bila Conglumerate - Sandy SILT with clay birdety
	angular to subrounded fingments of quarterte, light gray
<u></u>	Very Ford, moderniely to strongly cemental, Relatively
<u> </u>	dry to slapply damp from 28 to 40 feel. Water
	reported at 40 feet,
59	CLAY
73	Gila Conglomerate
82	
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	(feet) <u>15</u> <u>78</u> <u>56</u> <u>56</u> <u>59</u>

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller N	ame:		
Street		······································	······
City	State	Zip	Phone No.

Date

(D-1-12)34add

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Well	Driller	Report	and	Well	Log

WELL REGISTRATION NUMBER **55-** 591860

		GIC LOG OF WELL	
DEPTH FR	OM SURFACE	DESCRIPTION	Check (X) every
FROM	то	Describe material, grain size, color, etc.	interval where water
(feet)	(feet)		was encountered
0	40	WELL GRADED SAND W/GRAVEL	
40	170	SILTY SAND	
סרו	220	SILTY SAND WELL GRADED SOND (WATER 184') SILTY SAND SONDY SILT	$\sim$
220	370	SILTY SAND	
370	440	SANDY SILT	

DWR 55-55-10/01 (REV) page 3 0f 4

# LOG OF WELL

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- 2116 -

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
Ø	20'	CARALLO Stane
20	90	GIRAUE ( SAND Stone Fine grave 1 SAND Stone COURSE SAND QUANTZ, SAND Stone, CLAY
90	115	Course SAND QUANTZ, SANDSTONE, CLAY
115	1165	Medium Granel Quartz
165	200	Course GRAVEL, SANCESTONE
200	435	Fine apavel Quantz
485	520	Fine gRAUEL, QUANTZ VERY COURSE GRAUEL, QUARTZ, SANdStone COURSE GRAUEL, CLAY, SANdStone
520	600'	COURSE ODAVEL CLAY SANDSTONE
		June, , , , , , , , , , , , , , , , , , ,
		<u>DECEVED</u>
		□□□ <b>SEP - 6</b> 1996
		RECORDS MGT
	· · ·	
		· ·

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name: 1 Juni L. Maria	
Street 1) Martinky Ave	
Moothant JUA 15110	
City State Zip	Phone No.
Signature of Priller	Date

## LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
Ø	20	GIRAVEL SANDStone
20	90	GIRAUEI SANDStone Fine gravel SANDStone Course gravel SANDStone Course gravel SANDStone Course gravel Quartz SANDStone Fine gravel, Quartz
90	/15	CONSER SAND ON MOTO CLAN
115	165	Country and Chuddhave
165	200	Course grade Standstone
200	225	Eline adviel Quarter Sancostoric
200		1-INE GRENOLI, -LULANCIE
		<u> </u>
		<b>SEP - 6</b> 1996
		RECORDS MGT
<b> </b>		
<u> </u>	<u> </u>	
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		· · · · · · · · · · · · · · · · · · ·

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name: \ \int \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
1202 , Kentuley Aire	
Street Word and CA 95776	
City Stille Zip	Phone No.
Signature of Priller	Date

55-563621 (D-1-12)34dbc

### LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	55	Conglomerate

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name: John Hazlewood

<u>306 Air</u>	port RD		
Street			
Milan	NM	87021	<u>505-287-29</u> 86
City	State	Zip	Phone No.

Signature of Driller

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WELL REGISTRATION NUMBER 55 - 912420

	I SURFACE	Description	Check (T) every interval where water
FROM (feet)	TO (feet)	Describe material, grain size, color, etc.	was encountered (if known)
0	1100	Gila Conglomerate	
100	1510	Picket post volcanics	
1510	1650	Gila Conglomerate	
1650	1680	Picket post volcanics	
1680	3089	Gila Conglomerate	
3089	4018	Apache leap tuft	
			· · · · · · · · · · · · · · · · · · ·

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WELL REGISTRATION NUMBER 55 - 906297

	ION 5 GL	OLOGIC LOC OF WELL	i de la compañía de la compañía I
FROM (feet)	TO (feet)	<b>Description</b> Describe material, grain size, color, etc.	Check (T) every interval where water was encountered (if known)
0	10	Sand-tailings	*********
10	15	Sandy Clay	
15	16	Sand Minar stavel	-
16	$\mathcal{H}$	Sandy Clay Sandy Clay Sand Minergravel Sund (Cila Conglomerate)	~
		, , , , , , , , , , , , , , , , , , ,	
		TDJOI	
		V 151	

DWR 55-65 (REVISED 03/07/06) PAGE 3 OF 4

WELL REGISTRATION NUMBER

and a co			
DEPTH SURF		Description	Check (T) every interval where
FROM (feet)	TO (feet)	Describe material, grain size, color, etc.	water was encountered (if known)
0	30	Basin Fill	
30	230	Escabrosa Lmst	
230	275	Martin Lmst	
275	380	Bolsa Quartzite	
380	1380	Diabase	
1380	1510	Upper Dripping Springs Quartzite	
1510	2400	Diabase	
2400	2730	Lower Dripping Springs Quartzite	
2730	2740	Barnes Conglomerate	
2740	3060	Pioneer Shale	
3060	3360	Diabase	
3360	3400	Pioneer Shale	
3400	4210	Diabase	
4210	4255	Magma Vein (Qtz Vein)	

Projec	1 Na	une: _]	BHP Superio	<u></u>		D R					Project	Numb	er: <u>3800.</u>	.05	
Soil B	orin	<u>e</u>	Monitori	ng Well 🗴		Boring	z/Wel	l Nur	nber:				C-8	She	eet <u>1</u> of _
Boring	Lo	cation: 3	31805.78N(L	at) 111055(	).18W(Lor	ig)				Elev	ation ar	id Dan	.m: 3038.6	msl	
Drillin	ę Co	ontractor:	Water Dev	elopment	Driller:						Started	; <b>7</b> /.	30/9 <del>6</del>	Date Finished:	8/7/96
Drillin	g Eq	quipment:	Dresser T7	0W	Borehole D	Diamet	ter:	7.5	F <b>A</b>		pleted h: (feet)	) 12	1.0	Water Depth: (feet)	dry
ampl	ing I	Method:	California Met	hod 🗌 She	elby Tube 🗌	s	plit S	poon			-		WELL CONS	TRUCTION	
Drillin	g M	ethod A	ir Rotary	-	Drilling Flu	uid:	Air			Type of W	and Di ell Casi	ametei ng:	4.77" ID	Schedule 8	0 PVC
Backfi	11 M	aterial:	Type 5 Ceme	ent with 3%	bentonite	grou	it			Slot	Size:	D. <b>02</b> ''	Filter Mat	erial: 10-20	CSSI
.ogge	d By	John	Eliades	Checked	By:					Deve	lopmen	t Meth	od: Bail/S	wab and put	mp
T										Fraphic	Log		[ ·		
Scpth (feet)	USC Soil Type		_				Blow Counts	No.		Ś		ings			
Coth	SC Se	ر	Des	cription			low (	Sample No.	Sample	Lithology	Well	Readings		Remarks	
	2	-										PPM	-		
-		Clasts are	NGLOMERATE composed predo	minantly of lime	istone,	_				• 0			Type 5 cemen from 0 to 40 f	t with 3% bentor eet	nite grout scal
4		aphanitic and quarts	volcanics, dusky ine.	red medium-gra	ined dacite,	-				) 0	$\sim \sim$				
-	ł	VOLCAN	IC TUFF (DAC	ITE)	·					<u> </u>	NA KANANA KANA		, j. k. , i. i.		en en
}-		Dacite is o fracture fil	lusky red with ca l.	ilcite present as j	possible								4.77" ID Sche	dule 80 PVC cas	aine from 0 TC
-										·			50 feet		
						-									
											88				
						-					ĬĬ		20-40 Mesh sa	nd pack from 40	10 45 feet
1						-		ŕ							
<u>¥</u> -{	ſ	First water	encountered dur	ing drilling at 53	feet bls.								10-20 Mesh Co 45 to 121 feet	olorado Silica sar	nd pack from
-		Ŵ	per cous	Litaut		4				- [					
			encountered dur W is dv per cous 3/15/0	06		-					Ē				
				тн											
						4									
						-							.77" ID Schedi	ule 80 PVC scree	en (0.02" slot
-												\ \ ا	ize) from 50 to	I IV I <b>cet</b>	
1						-						,			
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						4						Т	otal cased depti	h ⇒ 110 feet	
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Proje			BHP Su		<b>-</b>	 C7							Project		xer: <u>3800</u> CC-8		VCT
Soil Bori				onitorinų V /8N(Lat)		X 550.12	RW/L	Borin neg)	e/Wel	l Num	iber.	11	ation w		um: 3038.0		<u>et 1. of</u>
		ontractor:		Develo		i i i	Driller.	· 66)				¥	Started		30/96	Date Finished:	8/7/96
Drill	ing E	quipment:	Dress	er 170₩	1	1	Borchold	: Diame	icr:	7.5'	•	Con	picted th: (feet)	12	1.0	Water Depth: (feet)	dry
Sam	pling	Method:	Californ	ia Method		Shelby	Tube	] :	Split S	poon				1	WELL CON	STRUCTION -	
Drill	n <u>e</u> N	iethod:	Air Rotz	гу	· •	1	Drilling	Fluid:	Air				: and Di /ell Casi		4.77" II	) Schedale 8	0 PVC
Back	1721 N	laterial:	Type 5	Cement	with 3	% be	ntonit	e gro	ut				Size; (			erial: 10-20	
Logg	ed B	John	Eliades		Chec	ked By	,					Dev	lopmen	i Meth	nod: Bail/S	wab and par	np
÷	Ë	· .				· · ·	·	1			4	iraphik	Log				
Depui (fect)	Suil Type			Descript	AY	15	2006		Blow Caun	Sample No.	굁	ABU.	=	Rendings	3	Remarks	
Dep	usc	-						Ì	Blow	Sem	Sample	Lithology	Well	Re			
			ONGLOM		<u></u>	<u>, : ; : ; :</u> 		<u>.</u>				<del></del>		ррм		at with 3% benao	lite grout se:
4		Clasts an aphanitic and quar	volcanics,	l predomin dusky red	ntly of i medium	limeșto -graine	ne, d dacite,					<u>،</u> ۵			from 0 to 40 i	leet.	<b>.</b>
		-						-				<u>੍</u>					
20-	į	Decite is	dusky red	(DACITE) with calcite	present	as pos:	sible	_				· .				<b>-</b>	
-								-							4.77" ID Scho 50 feet	dule 80 PVC cas	sing from 0 '
40								-						!			
-								1.							20-40 Micsh sa	und pack from 40	to 45 feet
Ţ	.	First yet	-	red during	de itik		-1 k1.								10-20 Mesh C	olorado Silica se	of and, from
		FU31 WOLE			_		el Dis.								45 to 121 feet		in here dut
60-j		$\leq$			<b>`</b> '		•		N		f	-7					
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4			-		し	Ŵ	"										
80-		5	<b>1</b>				<b>V</b>	1							4.77" ID Sched	ule 80 PVC scre	en (0.02* si
		(,	-	•	:e									<u>ا</u> ۲	size) from 50 k	110 fert	
	X	7		موار	<b>,, ,</b> , , , , , , , , , , , , , , , , ,	L			ľ					•			
-00	•	6	しょ	ر مار	1	1		-									
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	$\checkmark$		C					-						1	Fotal cased dep	th = 110 feet	
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roject Na						I			<u> </u>	
il Borin	· · · · · · · · · · · · · · · · · · ·	Boring	z/Well	Num	ber:				2038 4	Sheet of
	contractor: Water Development	Driller:					started:		m: 3038.6	Date Finished: 8/7/96
		Borehole Diame		7.5"		Com			1.0	Water Depth: (feet) dry
		<u>.</u>	ier. Split Sp			Læpu	r. (1661)		WELL CON	
Drilling N		Drilling Fluid:			_	Type of W	and Dia Il Casin	meter	4.77" II	) Schedule 80 PVC
	Material: Type 5 Cement with 3% I						Size: 0		1	terial: 10-20 CSSI
	By: John Eliades Checked I		- X							wab and pump
			T I	46 (A Are 1	G	iraphic	Log			
Depth (feet) USC Soil Type	Description		Blow Counts	Sample No.	Sample	Lithology	Weli	W Readings		Remarks
•     • <td>GILA CONGLOMERATE Clasts are composed predominantly of lime aphanitic volcanics, dusky red medium-grai and quartzite. VOLCANIC TUFF (DACITE) Dacite is dusky red with calcite present as p fracture fill. First water encountered during drilling at 52 Well is dwy per consolitant 5/15/06 TH</td> <td>ned dacite, </td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>from 0 to 40 M/ 4.77" ID Sch 50 feet 20-40 Mesh 10-20 Mesh 45 to 121 fee 4.77" ID Sch size) from 50 Total cased o</td> <td>edule 80 PVC casing from 0 T sand pack from 40 to 45 feet Colorado Silica sand pack from t</td>	GILA CONGLOMERATE Clasts are composed predominantly of lime aphanitic volcanics, dusky red medium-grai and quartzite. VOLCANIC TUFF (DACITE) Dacite is dusky red with calcite present as p fracture fill. First water encountered during drilling at 52 Well is dwy per consolitant 5/15/06 TH	ned dacite, 							from 0 to 40 M/ 4.77" ID Sch 50 feet 20-40 Mesh 10-20 Mesh 45 to 121 fee 4.77" ID Sch size) from 50 Total cased o	edule 80 PVC casing from 0 T sand pack from 40 to 45 feet Colorado Silica sand pack from t





Projec	i Nao						1	Project		<u>∓ _3800</u> C-8		
Soil B				Boring/W	<u>ell Nu</u>	nber:		.1		m: <b>3038.</b> (		<u>et 1</u>
		ation: 331805.78N(Lat) 111 ntractor: Water Developme		<u>og)</u>			V	Started:			Date Finished:	8/7/
		ntractor: Water Developme Ripment: Dresser T70W		Diameter:	7.5	,,	Com	picted h: (feet)			Water Depth: (feet)	dry
		Aethod: California Method	Shelby Tube	_	Spoor					WELL CON	<u></u>	
		nhod: Air Rotary	· [	Fluid: A			Type of W	and Di cli Casi	meter		D Schedule 8	0 PV(
		aterial: Type 5 Cement with	h 3% bentonit	e grout				Size; (			nerial: 10-20	
Logge	d By	John Eliades	hecked By				Deve	lopmen	t Meth	od: Bail/S	Swab and pu	mp 
	2		1 - N. J. J. A. B. State of Antonio Science Science Science Science Science Science Science Science Science Sci				Graphic	Log		*		
Depth (feet)	USC Seil Type	DescriMAY	( <b>15 2006</b>		Sample No.	Sample	Lithology	Well	Wdd Readings		Remarks	
		GILA CONGLOMERATE Classs are composed predominantly aphanitic volcanics, dusky red med	است 1933 کاربین پارتی م <u>یشن.</u> است است					<b>8</b>	FFM		ent with 3% bemo	nite gri
		aphanitic volcanics, dusky red med and quartzite.	lium-grained dacite,	' <b>_</b>			6 ~	Ň				
		VOLCANIC TUFF (DACITE)			-		<u> </u>					
20-		Decite is dusky red with calcite pre- fracture fill.	sent as possible	-				Š Š		4.77" ID Sei 50 feet	hedule 80 PVC ca	rsing fi
-				-				Ň		30 1001		
				4				ÿÿ				
40-				-]								
				-   	-					20-40 Micsh	sand pack from 4	10 10 4
	2	First water encountered during drift	tine at 53 feet bls.							10-20 Mesh 45 to 121 fe	Colorado Silica s et	and pe
60						T	2					
		5-110	)		X							
		ノー		H								
			um [	-								
80		1 Cent					1		. <sup>•</sup>	4.77" ID Set size) from 5	hedule 80 PVC so 10 to 110 feet	areen (
$\left\lfloor \begin{array}{c} \\ \end{array} \right\rfloor$			ic	-					[`` <i>`</i>	-		
		) 220 lon		· •					Ĺ		•	
100-	•	Pozzolan (em	.NI	Y					·			
		l ( em	ر. ر				-					
										Total cased	depth = 110 feet	
			-	_	1	1	f.	1	1	1		

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Project Superior Mine	Location	Supe	r10	۲,	AZ	Elevation	Project No. 3800.04
Drilling Co. Water Development Corp	Drilling Eq Dress		סר	رن س		Date Started 7/30/96	Date Finished 8/7/96
Conductor Casing None	Casing + Schedul				0		ch ID 80 PUC
Filter Pack 10-20 Mesh	Logged By			_	ades		air rotary
Colorado Silica Sand	Geophysic		_	Jor			237
Annular Seal	Developm					Completion Depth	110 F+ 615
ement grout to surface					•	Water Level 53	
Description		Depth (ft)		rilli Ite		Remarks	
Angular, poorly sorted, fine to con gravel composed predominantly limestore with some aphenitic w dusky red medium-grained dae guartEite Very fine sand with trace of find gravel composed entirely of ted (2.5 yR H/3) medium-grained Silt to fine angular gravel c entirely of dusky red mediu grained dacite	of Jolcanics, ite and e angular dusky dusky dacite	- 5 - - 10 - -15 - -20 -	<u>۲</u> ۰۶	5 Kr	Munsell Wet cus Hit bedroc chips of c remnants in the day	k at 14 ft. alcite in the cu from calcity s	Tts with

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WELL REGISTRATION NUMBER 55 - 910699

### Well Driller Report and Well Log

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		OLDSIG LOGIOF WELL	
	M SURFACE	Description	Check (T) every
FROM (feet)	TO (feet)	Describe material, grain size, color, etc.	interval where water was encountered (if known)
(1001)	(1001)		(if known)
0	88	Mine Tailunge, Silly Course	X
		Mine Tailings - Silly Smiths	
· · · · · · · · · · · · · · · · · · ·	<u> </u>		
		TO - OR '	
		TD-88' T'-67'	
		4 - 67	
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WELL REGISTRATION NUMBER 55 - 912941

FROM (feet)	M SURFACE TO (feet)	<b>Description</b> Describe material, grain size, color, etc.	Check (T) every interval where water was encountered (if known)
0	30	Basin Fill	(II KNOWN)
30	230	Escabrosa Lmst	
230	275	Martin Lmst	
275	380	Bolsa Quartzite	
380	1380	Diabase	
1380	1510	Upper Dripping Springs Quartzite	
1510	2400	Diabase	
2400	2730	Lower Dripping Springs Quartzite	
2730	2740	Barnes Conglomerate	
2740	3060	Pioneer Shale	
3060	3360	Diabase	
3360	3400	Pioneer Shale	
3400	4012	Diabase	

55-560980

(D-1-12)35cac

## LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	
t	240	Boesalt (Rel)
bereby certify that t	his well was drilled I	l by me (or under my supervision), and that each and all statements herein contained are true to the best of

I hereby certify that this well was drilled by me (or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller's Name (Qualifying Party):	
P.O. ROX 39	
Street Actedat AZ	85217
City 182.008 2 State	Zip 16.97
Phone Number	Date

DWR 55-55 (Rev 5/96)

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WELL REGISTRATION NUMBER 55 - 910698

SECTI	ON 5. GE	OLOGIC LOG OF WELL	
DEPTH FRO	M SURFACE		Check (T) every
FROM	то	Description	interval untere water
(feet)	(feet)	Describe material, grain size, color, etc.	was encountered (if known)
0	180	Mine Tailing - Silly Samps	$\times$
		TD-180	
		$\mathcal{A} = \mathcal{H} o$	
	l		
		na ana ao amin'ny tanàna mandritry dia mampikana amin'ny taona 2008–2014. Ilay kaominina dia kaominina dia kaom Jeografia	e <u>La seconda da seconda</u> e se dante
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		에 가지에 있는 것은 것이 있는 것은 것은 것은 것이 있는 것이 가지에 있는 것이 있었다. 가지에 가지에 가지 않는 것이 있는 것이 있는 것이 있는 것이 있는 것이 있다. 이 같은 것은 것은 것은 것은 것이 있는 것이 있다. 것이 있는 것이 있는 것이 있 같은 것은 것은 것은 것은 것은 것이 있는 것이 있	
		en forder en en el grada a production de la construcción de la construcción de la construcción de la construcci Canada en la construcción de la cons	a da ser a compositor da ser a
	<b>.</b>		
	And Andreas Andreas		
		· 문제 문제 · 이상 (이상 제품 이상 제품을 가지 수 있는 것 이상 것 이상 가지 않는 것 이상 가지 않는 것 이상 것 이	
		e en provinsi en la califación de la compañía de l Califación de la compañía de la comp	
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a a North Ardan Ann 218			
		n frankriger frankriger frankriger († 1945) 1940 - Berne Frankriger († 1946) 1940 - Erste Berne Berne Berne Ber Berne Berne Ber	ener 1990 - Ener Anna de Santa Referencia en la compañía de Santa de S
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			and the second second

DWR 55-55 (REVISED 03/07/06) PAGE 3 OF 4

### LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

· ·		MCC-5
From (feet)	To (feet)	Description of formation material
0	78	Mine tailings - Suturated
78	110	SANdy SILT, Light ATAY, Poorly to moderately cemental Poerly graded SAND, some Clay And Silt, mod. brown,
110	130	Porriy awhen SAND, some Chynni Silt, med brown,
130		drmp to muist, weakly cerented
130	150	Sundy SILT Light AVAY, Neakly comented. Perched AVIVATURATED at 150 Feet. Perched ZONE about 10 thick
		AVIUNTARATER at 150 Feet. Perched ZONE about 10 thick
159	155	Claypy and Silly SAND, GODWA, wet 19 Sctuinted
155	190	Sundy SILT, light gray, weakly comented, Perided groundwater Zong at 170 - Approximately 10 feet
		Ave und water ZOAR AT 170 - APProximately 10 feet
		thick. Cuttings become dry ht 185 Feet
190	205	Poorly graded Silty and Sandy GRAVIL, moderate
		Grown, Moist
205	250	SARAY SILT, OLOASSIONAL AVAVCILY INTERVALS
750	255	POORly Arnhed Silty GRAVEL, moderate Grown, Weakly
		comented, broundwater at 250 Feet. Artesian
		Conditions - water rose in hole to 78 peet.
255	270	Silty SAND, Moh. brown, Saturated.
270	\$15	Silty to CLAYEY SAND, Saturated becoming less
	82.0	wet with Repth.
315	320	Sandy SILT, mid. brown
320	323	Silly And GYNVELLY SAND, Mod. Brown Sundy SILT
323	325	SANdy SILT
		+·
	1	
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I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name:

State

Zip

Street

City

Phone No.

Date

**n** 1

WELL REGISTRATION NUMBER 55 - 906303

Support of the second s	1911 2 · 58 C	EOUCGICLOGIOEWELL	
DEPTH FRO FROM (feet)	DM SURFACE TO (feet)	<b>Description</b> Describe material, grain size, color, etc.	Check (T) every interval where water was encountered (if known)
Ù	10		(if known)
10	17	Sand up gravel	
		TD171	····
		V 8.5	
	<u> </u>		
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	. <u></u> .		<u> </u>
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i			i

LOG OF WELL MCC-2

55-548186 (D-1-12)35cdc

Indicate depth at which water was first encountered, and the depth and thickness of water bearing, beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
IJ.	5	Fill Material - Cabiles, Boulders, gravel
5	45	Gila Conglomerale - Cuttangs Consist of gravel Sized Fock Fragments, Drg, moderately to strangly
		Sized rock Fragments, Drg, moderately to strongly
		Cementel
65	85	Gila Conglomerale - Cuttings Contain more Sund
		Silch Arring, Dry, Strangly Cemented
85	135	6:12 Conglomerate - Cuttings Consist of grivel Sized
		rock Fragments. 70+ gravel, 30% Sand, Dry. Strokaly
		Cementer.
135	140	6.1 Conflommak - Cuttings contrib Tot Sand Bok
		gravel, Dry and moderately cemented.
140	170	6.1n Conglomerate - Cutaings contain 70% gravel, 30%
		SANd. Very hard, dry to slightly damp, mod. to
		Strongly Cementel.
170	178	bila Conglomitate - Cuttings, contain 60% sand, 40% gracel
178	185	6 the Conalomerate - Cuttings Contain 901 gravel, 101 Sand
185	215	6.11 Conglomerate - Cuttings Contain 901 gravel, 101 Sand Gila Conglomerate - Soil Aravel, 501. Sand, dry,
		strongly Cemented
215	260	bila Conglomerate - boto 701 sand, 301 grave
200	265	6.14 conglomerate - Sol. Sand, Sol gravel, duy,
		strongly Lemented
215	270	bin Constomate - Xor. Fine Shad to Silt. 2014 gravel
270	455	bild Conglamerate - Sout Content by male frite Sal gar
		bild Conglomerate - Sunt content bunges From Sor 90% Shight maisture at 415 feet. Water Conduct increasing
		From 415 - 430 Feet. WALEr Possibly Ancountered
		x+ 450 Feet.
455	470	Gila Conglumerate - Cuttings are SANLY (601-801)
470	485	CLEAR GVAVEL and rock Fragments, caturated
485	500	Cuidings Contain Bot Silt and Clay, poist
	1	

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Name:

Zip

Street City

State

Phone No.

Date

55-563622 (D-1-12)35cdc

## LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	122	Con Glomevate
	 	· · · · · · · · · · · · · · · · · · ·
	·····	
· · · · · · · · · · · · · · · · · · ·		

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Signature of Driller 2

Driller Name: Street 1]. M ちてって 505287 2986 State Zip Phone No. City

Ďate

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Υ.

WELL REGISTRATION NUMBER 55 - 906298

SECTION 5 GEOLOGIC LOG OF WELL-			
DEPTH FRO FROM	M SURFACE TO (feet)	<b>Description</b> Describe material, grain size, color, etc.	Check (T) every interval where water was encountered (if known)
(feet)	(iBBC)		(if known)
0	5	Gravel w/sand Sand w/ gravel Gita Conglomerate (Sand).	
.5	17.5	Sand w gravel	
17.5	27	Gita Conglomerate (Sand).	
		·	
		て 27	
		$\nabla$ 17	
	·		<u></u>
L			

55-807409 (D-1-12)35dbc

### LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
135	07.10	Granit (Brown)
\$180	200	CLAND (Rel)
200	2.6 <b>5</b> -	Granit (Brown) Clay (Rel) Onud Stone (Red Yery Spondy) (15 GPM)

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name: Jorny White

:

Street

City Zip State Phone No. Signature of Driller Date

#### (D-1-13)21cbc

# WELL REGISTRATION NUMBER 55 - 912601

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## Well Driller Report and Well Log

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	M SURFACE TO	OLOGIC LOG OF WELL Description	Check (T) avery interval where wate was encountered
(188t)	(fael)	Describe material, grain size, color, etc.	(if known)
0	2060	Apache Leap Tuff	
2060	2140	Tertiary Sedimentary Unit	
2140	2330	Tertiary Andesitic Basalt	
2330	2490	Tertiary Tuff and Sandstone	
2490	3390	Whitetail Conglomerate	
3390	4350	Naco Limestone	
4350	4740	Escabrosa Limestone	
4740	5120	Martin Limestone	
5120	5220	Bolsa Quartzite	
5220	5250	Mescal Limestone	
5250	5320	Upper Dripping Spring Quartzite	
5320	5330	Mescal Limestone	
5330	5350	Upper Dripping Spring Quartzite	
5350	5760	Precambrian diabase	
5760	5935	Mescal Limestone	
5935	5960	Precambrian diabase	
5960	6095	Mescal Limestone	
6095	6724	Dripping Spring Quartzite	
	1		
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	-		

DWR 55-55 (REVISED 03/07/06) PAGE 3 OF 4

(D-1-13)32bca

## Well Driller Report and Well Log

WELL REGISTRATION NUMBER 55-201852

FROM (feet) 0	M SURFACE TO (feet) 1653 1683	<b>DESCRIPTION</b> Describe material, grain size, color, etc. Rhyodacite Tuff	Check (X) every interval where water was encountered
(feet) O	(feet) 1653	Describe material, grain size, color, etc.	interval where water
		Rhyodacite Tuff	
	1683		
1653		Uitrophyre	
1683	1884.75	Conglomerate	

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DWR 55-55-10/01 (REV) page 3 0f 4

55-512401 (D-1-13)32bdd

#### LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
X-1 0	60	DACITE
X-2 O	107	DACITE
x-3 O	153	DACITE
·		
·····		
· · · · · · · · · · · · · · · · · · ·		
<u></u>		<u></u>

I hereby certify that this well was drilled by me (or under my supervison), and that each and all of the statements herein contained are true to the best of my knowledge and belief.

Driller CARY C MUNC <u>, DESERT</u> Address GLEND AZ. City State Zip Date 10-21-85

55-516107 (D-1-13)32bdd

LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
$\mathcal{O}$	14/6	Quysight
	1 1 2	
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	· · · · · · · · · · · · · · · · · · ·	
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- <del>*</del>		

I hereby certify that this well was drilled by me (or under my supervision), and that each and all of the statements herein contained are true to the best of my knowledge and belief.

 $\{ j \in \mathcal{J}_{i} \}$ 

ee\_ Driller B. Name

BOYLES BROS. DRILLING CO. 7235 N. 67th Ave.	
City Glendale, AZ 85301	Zip
Date 11-24-86	

55-536975 (D-1-13)32cab

### LOG OF WELL

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Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encounterd, and depth to which it rose in well.

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From	То	Description of formation material
(feet)	(feet)	
0	662'	White DAcite tuf Water@ 634'
	000	While DACIES JUF
		Water@ 634
	1	
·····		
		Note: This is A Geo-scientific hole
		and the second second second second
		Wrilled for A series of packer + for MAtion tests
		to be done ober A period of time by ust A.
		Note: This 15 A Geo-scientific hole Drilled for Aseries of packer + formation tests to be done ober A geriod of time by usf A. Hole drilled @ 45° Angle
<u></u>		ITUE CUTITE OF THE PARTY
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I hereby certify that this well was drilled by me (or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name S. Londsa

Street

Zip State Date

### LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	560	Red & Gray Welded Tough (Hard)
	+	
		· · · · · · · · · · · · · · · · · · ·
	<u>}</u>	

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

## Driller Name: Arizona Beeman Drilling LLC

P.O. Box 3370		
Street		
Apache Jct AZ City State	85217	602-983-2542
City State	Zip	Phone No.
January 3, 1994		
Data		

Date

(D-1-13)32dbd

# Well Driller Report and Well Log

WELL REGISTRATION NUMBER 55-217407

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		GIC LOG OF WELL			
	DM SURFACE	DESCRIPTION Describe material, grain size, color, etc.			Check (X) every interval where wate
ROM (feet)	TO (feet)				was encountered
0	1670	Apache Leap Tuff			x
1670	3400	Whitetail conglomerate		•. 	x
3400	6713	Volcaniclastics			X
			· · ·		
				 ,	
			· · · · · · · · · · · · · · · · · · ·		
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(D-1-13)32dca

## Well Driller Report and Well Log

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WELL REGISTRATION NUMBER 55-201850

SECTION 5. GEOLOGIC LOG OF WELL					
	OM SURFACE	DESCRIPTION	Check (X) every		
FROM (feet)	TO (feet)	Describe material, grain size, color, etc.	interval where water was encountered		
0	1424	DACITC TUFF	x		
1424	1496	VITROPHYRE			
1496	1587.4	SILTSTONE, SANDSTONE, CLAYSTONE			

(D-1-13)32dcd

Well Driller Report and Well Log

WELL REGISTRATION NUMBER 55-587213

SECTION	5. GEOLO	GIC LOG OF WELL	
DEPTH FR	OM SURFACE	DESCRIPTION	Check (X) every
FROM (feet)	TO (feet)	Describe material, grain size, color, etc.	interval where water was encountered
0	23	GRANEL + CLAY Solip Rock.	
23	T.D.	Solip Rock.	

WELL REGISTRATION NUMBER 55 - 908053

SECT	ION 5. GE	OLOCIC LCG:OFWELL	
DEPTH FRO	M SURFACE	Description	Check (T) every
FROM (feet)	TO (feet)	Describe material, grain size, color, etc.	interval where water was encountered (if known)
0	10	Recomposed Lock & day	
10	20	Black cock	
20	180	Black with fractures water	X
180	260	Black and driver with tractures, water	X
260	340	Black and daisete with tractures water	X
340	400	Black & red deisite tractured	
ļ	ļ		

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55-582657 (D-2-11)1cdc

## LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	28	Gravel + Clay
20	80	ROCK (LOOSE) Gray water 40
80	150	Gravel + Clay Rock (Loose) Gray water 40 Fractured Hard Rock
	· · ·	
	······	

I hereby certify that this well was drilled by me (or under by supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name: HIGH DESERT WATER DRILLING, LTD

P.O. BOX 547	78			
Street	-14			
ORACLE, AZ	85623-5478			
City	State	Zip	Phone No.	
Signature of Drille	Shel	lip	9-20-200 Date	3

T02S-R11E 01CDD

## Well Driller Report and Well Log

WELL REGISTRATION NUMBER 55 - 904495

(feet) (feet) Describe material, grain size, color, etc. was e	(1) every where water encounter mown)
0 17 LOOSE GRAVEL. 1739 FINE GRAVET AND BOULDERS	
1739 FINE GRAVEL and BOULDERS 39 60 GRAVEL WITH SOME CLAY. 36 WATER ENOUNTER X	
39 60 GRAVEL WITH SOME CLAY. 36 WATER ENOUNTER X	
36 WATER enounter X	
	· · · · · · · · · · · · · · · · · · ·

#### LOG OF WELL

55-519775

T02S-11E 02DBB

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	5	TED Soil
5	45	Top Soil Conglomerate
45	90	HARD rock
90	100	grave!
		0
		WATER @ 30-40
		WATER @ 90
-		

I hereby certify that this well was drilled by me (or under my supervision), and that each and all of the statements herein contained are true to the best of my knowledge and belief.

Driller Makey Guns
Name O
Address
Minni, HZ 85359 City State Zip
Date 1-28-88

ан. В

### LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	80	Orphal
80	240	Grand Red Granith
	n	
	· · · ·	

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

SERVICE, INC.

Driller Name: ENVIRONMENTAL DRILLING & PUMP

<u>64 WEST RED F</u>	ERN ROAD
Street	
OTTEN ODDEV	17 05010

AZ 85242 <u>OUEEN CREEK</u> Phone No. Zip State City 0 Signature of Driller Date

(D-2-12)3

### Well Driller Report and Well Log

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WELL REGISTRATION NUMBER 55 - 906296

inter for	KON SEG	OLOGICLOG OF WELL	
DEPTH FRO	TO TO	Description	Check (T) every interval where water
(feet)	(feet)	Describe material, grain size, color, etc.	was encountered (if known)
Ò	5	Silty Clay	
5	8	Sand Maravel	-
8	15	Sand ulgravel (weathered Gila Conglomerate)	<i>L</i>
U	15	Sand algebraic minorsitt	
15	20	Sand winer gravel	
20	45	verydense sand upgravel (weathered Gila Conglomerate)	
45	51	very dense sand w/gravel (Gila Conglomerate)	
0	4	Gravelly clay	
<u> </u>	5	Sand wy gravel (Gila conglomerate.	
C	2.5	Sand (tailings)	
2.5	5	Sand	
5	10	Sand Trace tailings.	
10	12.5	Sund Minor clay ( bila Conglomorate).	
Ø	9	Clayey sand	
9	15	tailing slime	
15	20	Sand Myminor gravel ( Gila Conglomerate)	
0	5	Sand & Clay	
5	10	Silty Sand	~
<u> 0</u>	15	Clayey Sand	~
15	_19	Sand minor gravel (Gila Conglomerate	~
C)	3	Sand Minor clay	
3	8	Sand minor fires.	
8	9	Sand minor a ravel (Gila Conglowerste	
	<u>`</u>		
		· · · · · · · · · · · · · · · · · · ·	
			]

DWR 55-55 (REVISED 03/07/06) PAGE 3 OF 4

55-541251 (D-2-12)4aaa

### LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encounterd, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
Ċ	13	SAND AND Big Boulders
16	23	CLAY
23	69	SAND AND SMALL NOCKS + STUANS OF CLAY
li 5	165	SAND AND SMALL ROCKS
		TETAL DONTH 145'FT.

I hereby certify that this well was drilled by me (or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name: Thomas K. assill AdOTA Street

City Zip State ~ 7 Date\_/

55-563618 (D-2-12)4aab

#### LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	_10	Fill
10	20	Alluvium
20	160	Volcanic tuff
160	442	Mudstone
442	590	Conglomerate
	· · · · · · · · · · · · · · · · · · ·	
	·	

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

,

•

Driller Name: John Hazlewood

	rport Rd		
Street			
Milan	NM	87021	<u>505-287-</u> 2986
City	State	Zip	Phone No.
1.1.1	Arley		
Signature of I	<u>- Hayler</u> Driller		Date

### LOG OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	<b>Description of formation material</b>
<u> </u>	420	
┝	4.0	Same orone long burnall
	<u>.</u>	
······································		
		· · · · · · · · · · · · · · · · · · ·
		RECORDS MGT

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

₩.	$\Lambda$ $\mathbb{N}$ .	
Driller Name: , billi	11 Marie	
1202 Kastuka	Ave	
Street Wordank (A	95776	
City Start	Zip	Phone No.
Signature of Driller	· · · · · · · · · · · · · · · · · · ·	Date

LOG OF WELL

MCC - 2 (D-2-12)4adb

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

2 70 89 AD	70 80 95 155	Gravelly SAND to SARLY BRAVEL, thin, meherately to strongly cemented, dry, poorby sorted Silty and Clayey SAND, brown, breakly cemented, Slightly damp to damp. Silty CLAY. brown, dampto moist, Very hard
81	Q D	to strongly comented, dry, poorby sorted Silty and Clayey SAND, brown, preakly comented, Slightly damp to damp.
82	Q D	Slightly damp to damp.
89 AD		
81 AD		Silty CLAY. Grown, annete moist, Very hard
90	155	
1		Pourly graded CLAYEY SAND brown moist, Possible
		groundwater between 130 And 155 Foot
155	160	Sundy CLAY, brown, Very muist, comented nodule
160	185	Clayer and Silty SAND, moist becoming
		Saturated at 165 Feet
185	225	Silty CLAY, moist be coming damp to slight
		damp with depth, comented hodules 2+
		200 FPet
<u>·</u>		
	······································	
		·
	·	
		·

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name	
	,
Street	

City State Zip

Phone No.

Date

55-508525 (D-2-12)4bad

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

LOG OF WELL

From (feet)	To (feet)	Description of formation material
0	12	TOP SOIL - SAND BOULDERS - CHAVEL
12	22	BAULDONS - CONTREL
22	133	Brown CLAY
1333	140	<u>Cons.</u>
140	150	Brn. CLAY D.P
·		
· · · · · · · · · · · · · · · · · · ·		
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	9. <sup>1</sup>	
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I hereby certify that this well was drilled by me (or under my supervison), and that each and all of the statements herein contained are true to the best of my knowledge and belief.

Dril1 ~~~ Name Address Zip State \* 31 -Date

#### LOU OF WELL

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

From (feet)	To (feet)	Description of formation material
0	400	Clay (Rec)
400	460	Chory & Grokel
460	460 750	Busnett '
<u> </u>		
	<u> </u>	

I hereby certify that this well was drilled by me(or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller Name: Dong White
to Box 35 U
Street Asselve Jet An Strin
City State Zip <u>OBL·6032</u> Phone No Date
Phone No. Date
Signature of Driver
- de la da

and the second and the second second

55-556793 (D-2-12)4ddc

# LOG OF WELL

From (feet)	To (feet)	
D	20	Top Soil Cloy (red) Epide Gila Conclomerat
0 ,20	100	Clay (Red)
100	240	Enda GILA Conclomerat
		0
	······	

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

hereby certify that this well was drilled by me (or under my supervision), and that each and all statements herein contained are true to the best of my knowledge and belief.

Driller's Name	(Qualifying	Party)	: <i>Cle</i>	in	attito
~~~~	~		1	1	

Zip State

Phone Number

Street

Citv

(D-2-12)4ddc

#### 31L -. Well D

Well Dri	ller Repor	t and Well Log	WELL REGISTRATION NUMBER 55-592991
SECTION	5. GEOLO	GIC LOG OF WELL	
DEPTH FR	OM SURFACE	DESCRIPTION	Check (X) every
FROM (feet)	TO (feet)	Describe material, grain size, color, etc.	interval where water was encountered
6	36	Large Rocks + Gravel	
36	110	Large Rocks + Gravel Gravel & Clay @/10	X
110	170	Clay + Rock	
120	180	ClaytRock Gravel Rock	X
180	200	Rock	
	· · · · ·		

	200		
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,			
DWR 55-55-10/0	1 (REV) page 3 0f 4	4	

# Well Driller Report and Well Log

DEPTH FROM SURFACE     DESCRIPTION     Check (X) even       Ideal     TO     Describe material, grain size, color, etc.     international international was second and was second	SECTION	5. GEOLO	GIC LOG OF WELL	
(foot) (foot) (foot)	DEPTH FR	OM SURFACE	DESCRIPTION	Check (X) every
(red)     was accurated       0     100     Black basact water     X       100     120     120     120     X       120     -200     pink cock , water     X       120     -200     -200     -200       120     -200     -200     -200       120     -200     -200     -200       120     -200     -200     -200       120     -200     -200     -200       120     -200     -200     -200       120     -200     -200     -200       120     -200<			Describe material, grain size, color, etc.	interval where water
0 100 Black Lasot water × 100 120 Red water dariet water × 100 -200 Pink Rock, water × 	(feet)	(feet)		
100     120     Red. web - dariete, weta     ×       120     -200     pink. cock, wata     ×	0	100	Black Basalt water	X
R0     200     pink_ rock, water     X	100	120	Red rock - daisite water	X
	RO	200	pink rock water	X
Image: Section of Sectio				
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T02S-12E 06DDD 55-507771

#### LOG OF WELL

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a second second

Indicate depth at which water was first encountered, and the depth and thickness of water bearing beds. If water is artesian, indicate depth at which encountered, and depth to which it rose in well.

FROM (FEET)	TO (FEET)	DESCRIPTION OF FORMATION MATERIAL
teats d'	95	water was in secreting ended up maker about 50g
lon. O'	$\mathcal{P}'$	Dand & Rock
pi	951	Grond Red Rock the rest of the way -
		· · · · · · · · · · · · · · · · · · ·
· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·
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I hereby certify that this well was drilled by me (or under my supervision), and that each and all of the statements herein contained are true to the best of my knowledge and belief.

Driller, Set Le C. J. Name 

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	* AKIZONA DEPARIMENT OF WATER RESOURCES GROUNDWATER MANAGEMENT SUPPORT SECTION 500 NORTH THIRD STREET PHOENIX, ARIZONA 85004-390.3 (602) 417-2470 FAX (602) 417-2422 APR - 8 1996 WELL ABANDONMENT COMPLETION REPORT RECORDS MGT
	Well Registration No. 55-552442
2.	
	Well Location:       Z       NS       12       EW       5       NE       4       SE       4       SW         Township       Range       Section       10 Acre       40 Acre       160 Acre         Owner of the Well:       KENNECOTT       EXP/ORATION       Company
	1802 W. GRANT RD- STE 119 TULSON AZ 85745
	Address City State 2
4.	Owner of the Land: Name:SAME AS ABOVE
	Address City State ;
5.	Well Description:       1800'       3.032       1290' of 94/MM       (Outer Casing)
6.	Reason for abandonment: <u>Completed</u> Hole
7.	Prior to abandonment, did the well have 20' of steel surface casing <u>AND</u> 20' of grout in the annular space surrounding t surface casing? Yes No_X
8.	If the answer to No. 6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes $X$ No
9.	Identify the materials and methods used to abandon the well: THICK BENTONITE MUD FROM 20' TO 1800
	0-20 CEMENT SURFACE plug
10.	Is this Abandonment Completion Report filed in accordance with R12-15-816,F.7 Yes_K No
	How deep does the cement plug extend below land surface? ZO'
12.	Was the well backfilled above the cement plug? Yes No
13.	Date abandonment completed: 3-8-96
14.	Drilling Firm: CHRISTENSEN Boy/ES CORP. License No: 28 6527 W. NORTHVIEW Glendale AZ 85301
	6527 W. NORTHVIEW Glendale AZ 85301
	City State Zip
DA	TE: 4-2-96 SIGNATURE OF WELL DRILLER
DWI	R 55-58 (Rev 10/95) CANCELLED ENTERED ADD 1 A 1000

ENTERED APR 1 0 1996

	AKIZONA DEPARIMENT OF WATER RESOURCES
	GROUNDWATER MANAGEMENT SUPPORT SECTIONE C E
	500 NORTH THIRD STREET PHOENIX, ARIZONA 85004-3903 (602) 417-2470 FAX (602) 417-2422 APR - 8 1996
	WELL ABANDONMENT COMPLETION REPORT RECORDS MGT
	1.5. \$45-594; R12-15-816: Within 30 days after a well is abandoned, the well drilling contractor shall file a Well Abandonme
Cor	mpletion Report on a form prescribed and furnished by the Director.
1.	Well Registration No. 55- 552442
2.	Well Location: $2 NS 12 EW 5 5W 4 NW 4 NE$ Township Range Section 10 Acre 40 Acre 160 Acre
<b>J</b> .	
••	Owner of the Well: Name: KENNECOTT EXPLORATION CO.
	1802 W. GRANT RD. STEING TUCSON AZ 85745
	<u>1802 W. GRANT RD. STE 119 TUCSON</u> Address City State Zi
1.	Owner of the Land:
••	Name:SAME AS ABOVE
	Address City State Z
	Well Description:       2040'       3.032       1730' of 4"       (Outer Casing)         Hole Depth       Diameter       Type of Casing       Diameter       Type of Casing
	Hole Depth Diameter Type of Casing Diameter Type of Casing
	Reason for abandonment: Hole completed
	Prior to abandonment, did the well have 20' of steel surface casing <u>AND</u> 20' of grout in the annular space surrounding the surface casing? Yes No
	If the answer to No. 6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes 🗶 No
•	Identify the materials and methods used to abandon the well: THICK BRU towith mud from 2040' +020
	0-20' CEMENT Plug
0.	Is this Abandonment Completion Report filed in accordance with R12-15-816, F.7 Yes X No
۱.	How deep does the cement plug extend below land surface?
2.	Was the well backfilled above the cement plug? Yes No
3.	Date abandonment completed: 3 - 10 - 96
4.	Drilling Firm: Name: CHRISTENSEN Boyles CORP. License No: 28
	Address City State Zip
)A	TE: 4-2-96 SIGNATURE OF WELL DRILLER
	0

DWR 55-58 (Rev 10/95)

, Is	којест со		PARTMENT O 15 South 15th Phoenix, Arizo REPORT FOR I	h Avenue ona 8500'	7		<u>G</u> E I PR - 8 I <u>ARDS</u>	<u>VE</u> 996 MGT
		ed by the <u>owner</u> on of the well dr	in all detail for silling project.	each hold	drilled and fi	iled with t	the Depar	rtment within
. Owner Na	ame: $K$	unerotE	xploration	Comp	444			
	•		el. Suite 119	f	Tucson	A	1z	85745
	Street				City		State	Zip
2. Lessee or	Operator Na	me:	Same	as a	bove			
Address:		······						
	Street		_		City		State	Zip
B. Driller Na			Boyles Corp					
Address:	6527	W. Nort	hview AI	Ve.	Henda	le	AZ	85301
	Street				City		State	Zip
	Township EGISTRATIC	N NO, 55- <u>S</u>	nction 10-Acre	40-Act		RED)		,
WELL RI 5. Type of C 3. Abandon	Township EGISTRATIC asing (if inst: ment method	N NO, 55- <u>S</u> 1 alled): <u>/290<sup>-</sup></u>	nction 10-Acre 52442 DESCRIPTION of 94mm Co sed if abandoned	40-Acr N OF WE	e 160-Acro (REQUI LL /280 ' ven hick	RED) narch,	mud a	0' to 1800;
WELL RJ 5. Type of C 3. Abandon  Was well	Township EGISTRATIC asing (if inst: ment method - 20 ' Ce abandoned in	N NO. 55- $S$ alled): $1290'$ and material us men f S4m f a the course of d	nction 10-Acre 52442 DESCRIPTION of 94mm Co sed if abandoned	40-Acr N OF WE 52729. 1: 1: Per 1: 10 R12-1	e 160-Acro (REQUI :LL /280 'ven hick) ben fi - DWR vo	RED) Norcoly gulation Yes <u>V</u>	Mud a. R-12 No_	
WELL RI 5. Type of C 5. Abandon 0 - Was well 7. Date of p	Township EGISTRATIC asing (if inst: ment method - 20 ' Ce abandoned in	N NO. 55- $\underline{S}$ alled): $\underline{1290}^{\prime}$ and material us $\underline{men f}$ <u>S4m f</u> the course of d From: $\underline{10-5}$	action 10-Acre 52442 DESCRIPTION of 94mm Co sed if abandoned Face Plag. crilling pursuant 20-95	40-Acr N OF WE 52729. 1: 1: Per 1: 10 R12-1	e 160-Acro (REQUI :LL /280 'ven hick) ben fi - DWR vo	RED) Norcoly gulation Yes <u>V</u>	Mud a. R-12 No_	0' to 1800; 2-15-816
WELL RJ 5. Type of C 3. Abandon 2 Was well 7. Date of p U X C D	Township EGISTRATIC asing (if inst: ment method <u>- 20 ' Ce</u> abandoned in eriod drilled: Inconsolidated H consolidated H	N NO. 55- $\underline{\qquad}$ alled): $\underline{/290'}$ and material us <u>ment</u> <u>sum</u> the course of d From: <u><math>10-6</math></u> d Formation	action 10-Acre 52442 DESCRIPTION of 94mm Co sed if abandoned Face Plag. crilling pursuant 20-95	40-Act	e 160-Acro (REQUI :LL /280 ' ven hick) ben f - DLJR vo 15-816, F.? To: /	RED) RED) Paritic 1 gulation Yes V Ves V Ves V Ves V Ves V Ves I Ves I V	No R-12 No 95 IN THIS RECORL	0' += 1800, 2-15- 816

Owner/Lessey's Signature

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1/2/96 Date

<u>ARIZONA DEPARTMENT OF WATE</u> 15 South 15th Avenue Phoenix, Arizona 85007	i kad bed	E G E Apr – 8 RECORDS	1996 S MGT
PROJECT COMPLETION REPORT FOR MINERA	L EXPLORATIO	NURILLING	and and a second second second
This report must be prepared by the <u>owner</u> in all detail for each hole 30 days following completion of the well drilling project.		rith the Depar	tment within
1. Owner Name: Kennecott Exploration Compa-	y		
Address: 1802 W. Grant Rel. Suite 119 - Succi	Ciry	AZ State	85745 Zip
2. Lessee or Operator Name: Same 45 46	pic.		
Address:	City	State	Zip
3. Driller Name: Christensen Bayles Carp.			
Address: 6527 W. Northview Ave. G	lendale	Az d	15301
Street	City	State	Zip
4. Location: 2 2 12 FM 5 SW 1/4 NW Township Range Section 10-Acre 40-Acre	1/4 <u>NE</u> 1/4 e 160-Acre		
WELL REGISTRATION NO. 55-52442	(REQUIRED	)	
DESCRIPTION OF WE	LL		
5. Type of Casing (if installed): 1730' of 4" Lasing	All remove	d.	
• IF	Thick) benton t	Sc. mud 7	hon
2040' to 20' 20' play of Cl	ement at.	surface	
	······································		
Was well abandoned in the course of drilling pursuant to R12-1			
7. Date of period drilled: From: 1-19-96	To:	-96	
LOG OF WELL			
Unconsolidated Formation	<u></u>		····
Consolidated Formation Depth to water in feet below land surface: Not Detarmined	DO NOT WR OFFI	ITE IN THIS CE RECORI	
(if encountered or detected)	Registration No.		
	Received	By	
I state that this report is filed in compliance with A.R.S. §45-600 and is complete and correct to the best of my	Entcred	By	
knowledge and belief.	File No.		
Jan J. Jak 4-2-96	L		

Owner/Lessee's Signature

7-2-96 Date

ARIZONA DEPARTMENT OF WATER RESOURCES							
EXPLORATION WELL(s)	15 South 15th Avenue	EXPLORATION WELL(s)					
- <b>FILII</b> ∛G FEE \$10.00	Phoenix, Arizona 85007	FILING FEE \$10.00					
	- <sup>27</sup> - 14	<b>NCI - 3 1995</b>					
NOTICE OF INTENTIO	N TO DRILL AND ABANDON F	EXPLORATION WELL(s)					
Section §45-596, Arizona Revised Statutes, and Rule 12-15-817 provide: Prior to drilling one or more exploration wells, the well owner, or exploration firm shall file a Notice of Intention to Drill on a form provided by the Department.							
WELL/LAND LOCATION	6. Purpose of well(s) drilled	9. DESCRIPTION OF THE WELL:					
	pursuant to this Notice:	Diameter <u>5</u> inches Depth <u>3000</u> feet					
1. Township Range Section	Mineral Exploration $\_$	Type of casing. If none, state:					
	Geotechnical	Constal Constal (5" AD)					
In the case of a single well, list 10-acre subdivision.	Cathodic Protection Grounding	Some stul Casing (5", OD),					
	$\sim$	but temporary. 11/2"PVC					
$\frac{1/4}{10 \text{ ACRE}} \frac{1/4}{40 \text{ ACRE}} \frac{1/4}{160 \text{ ACRE}}$	7. Number of wells	for geophysical logging.					
	(See Condition 4 on reverse side)	to propigitar configuration					
2. County Lina	8. Owner of Land of wellsite:	10. Construction will start					
3. Kennecott Exploration Co. Applicant Name	USFS, Globe Ranger Distric	+ Oct. 16 95					
Applicant Name	Name	Month Day Year					
1802 W. Grant Rd. Suite 119	Routel, Box 33	11. Drilling Firm:					
Address	Address						
TUCSON AZ 85745	610be, AZ 85501	<u>Lvistensen Boyles Corp.</u> Name					
City State Zip	City State Zip						
		6527 W. Northview AVE.					
4. Joey Wilkins Name of Contact Person	DO NOT WRITE IN THIS SPACE OFFICE RECORD	Address					
	File No. D(2-/2) 5	Glendale AZ 85301					
Phone 520-670-1311	Filed 10-3-95 By Ac	City State Zip					
5. Owner of Well:	Input By 17 1995	28					
same as above	ENTERED UCI 1 ( 1930	DWR License Number					
Name	DUPLICATE	Exploration					
	Mailed 10-16-95 By	ROC License Category					
Address	Registration 55- 55-2442	12. Period well will remain in use:					
	AMA/INA $h_{\lambda'}$	<u> </u>					
City State Zip	W/S <u>UB</u> S/B <u>06</u>						
13. Proposed method of abandoment of	wall(s) after project is completed:	In accordance with DWR					
		-					
	Rule R-12-15-816						

14. Is the propsed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials or a petroleum storage area and tanks? Yes \_\_\_\_\_ No \_\_\_\_

#### GENERAL INSTRUCTIONS

- 1. Fill out this form in **DUPLICATE** and send WITH \$10.00 FEE to 15 South 15th Avenue, Phoenix, AZ 85007.
- 2. For specific instructions, limitations and conditions, see the reverse side of this form.

I state that this Notice is filed in compliance with Rule A.A.C. R12-15-809 and R12-15-816(F), and is complete and correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

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ells shall be in accordance with A.A.C.

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year after the date of Notice.

- 3. Mineral exploration, geotechnical, cathodic protection or grounding holes of 100 feet of depth or less do not apply to these provisions and do not require filing. However, if water is encountered during the drilling of these well(s), then the well(s) must be properly abandone in accordance with Condition 1 above.
- 4. More than one well may be drilled under a single notice for mineral exploration and geotechnical wells so long as they are located within a single section.
- 5. A Project Completion Report and WELL ABANDONMENT COMPLETION REPORT must b filed for each mineral exploration hole within thirty (30) days of completion of drilling. A Well Driller Report for each hole drilled, must be filed by the driller within thirty (30) days ( completion of drilling for geotechnical, cathodic protection and grounding.
- 6. The location of mineral exploration and geotechnical wells may be limited to the section, township and range. However, a complete legal description may be provided at the option of the well owner.
- 7. Pump equipment may not be installed on wells drilled for mineral exploration, geotechnical, cathodic proctection or grounding purposes.
- 8. Special construction standards required pursuant to R12-15-821:\_\_\_

<sup>9.</sup> To abandon a well in the course of drilling, the drilling contractor shall not remove the drilling rig from the well site, otherwise, a Notice of Intent to Abandon a Well must be filed prior to abandonment, and abandonment shall not commence until Department authority has been issued or, if during the course of drilling a well the Driller or owner elects to discontinue drilling and proceed with the abandonment of the well. The filing of a Well Abandonment Completion Report shall be filed within 30 days of abandonment, in accordance with R12-15-816.F.

## ARIZONA DEPARTMENT OF WATER RESOURCES

500 North Third Street, Phoenix, Arizona 85004 Telephone (602) 417-2470 Fax (602) 417-2422

October 13, 1995

FIFE SYMINGTON Governor

RITA P. PEARSON Director

#### KENNECOTT EXPLORATION CO. 1802 W. GRANT RD. S119 TUCSON, AZ. 85745

Re: Registration No. 55-552442 THRU 55-552444

File No. VARIOUS

Dear Well Owner:

Enclosed for your records is an annotated copy of the Notice of Intention to Drill a well which was recently filed with this Department. This is returned to you as evidence of compliance with A.R.S. §45-596. Your designated driller has been mailed, separately, a Well Drilling Card which he is required to have in his possession before commencing to drill the well.

This well is authorized to be drilled for mineral exploration purposes. Because of this, no pump equipment may be installed. A Project Completion report is being furnished you for each hole to be drilled. You are required to submit this within 30 days after completion of drilling. Frequently, exploration wells are abandoned shortly after drilling. Per R12-15-816.F a Well Abandonment Completion Report must be submitted by the driller. The Department of Water Resources requires you to obtain written permission before proceeding with the drilling, in the event, that you determine it necessary to change the location of the proposed well. A properly signed amended Drilling Card must be in the possession of the driller before drilling commences at a different location.

For your <u>future</u> use, a Change of Well information form is enclosed for your convenience. Per A.R.S. §45-593, the person to whom a well is registered shall notify this Department of a change of ownership of the well and/or information pertaining to the physical characteristics of the well, in order to keep the well registration file current and accurate.

Sincerely,

llen hand

Ellen Kane Water Resource Technician Groundwater Section

ARIZONA DEPARTMENT OF WATER RESOURCES GROUNDWATER MANAGEMENT SUPPORT SECTION 500 North Third Street Phoenix, Arizona 85004-3903
THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILL OPERATIONS
WELL REGISTRATION NO: 55-552442
AUTHORIZED DRILLER: CHRISTENSEN BOYLES CORP. LICENSE NO: 28
NOTICE OF INTENTION TO DRILL MINERAL EXPLORATION WELLS HAS BEEN FILED WITH THE DEPARTMENT BY: CONSULTANT:
WELL OWNER: KENNECOTT EXPLORATION CO.
The well(s) is/are to be located in the:
1/4 of the 1/4 of the 1/4 Section 5 Township 2S Range 12E
No. of wells in this project: 2
THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE 2ND DAY OF OCTOBER, 1996.
CHIEF, GROUNDWATER MANAGEMENT SUPPORT THE DRILLER MUST FILE A LOG OF THE WELL WITHIN 30 DAYS OF COMPLETION OF DRILLING

RECEIPT       NR 23440         JOEY WILKINS 450 P. STOOP TUCSOT, AZ. 15705       STATE OF ARIZONA DEPARTMENT OF WATER RESOURCES 500 NORTH THIRD STREET PHOENIX, ARIZONA 85004 (602) 417-2405         FILE NO. VARIOUS       552442       THRU         FILE NO. VARIOUS       552442       THRU         NOI FEE       \$10.00       \$30.00	a na niza nandana kata kata niza a manata tita na dana da na da na da na da ta data taki kata taki taki taki ta	naraturu senikeret alininta Menudi Meldari enangenangenangen angen anarat	a enderwoord needen with all lands of the week out of the second second second second second second second second	เข้ามาร์เริ่มได้หนังจะสหัวทางสมอาการสหัวลา	
JOEY WILLT'S         450 F. STOOP         PHCSOT, AZ. #5705         FILE NO. VARIOUS         552442         THRU         552442         THRU         552444         ITEM DESCRIPTION         RATE         AMOUNT         NOI FEE         \$10.00         \$30.00		REC	ΞΙΡΤ	NR 23	440
FILE NO.     VARIOUS     552442     THRU     552444       ITEM DESCRIPTION     RATE     AMOUNT       NOI FEE     \$10.00     \$30.00	450 E. SHOOT		DEPARTM 500 PH	IENT OF WAT NORTH THIR OENIX, ARIZO (602) 417-2	ER RESOURCES D STREET DNA 85004
NOI FEE \$10.00 \$30.00	FILE NO. VARIOUS	552442		· .	
PEIDE		ITEM DESCRIPTION		RATE	AMOUNT
C C T T T T T T T T T T T T T T T T T T	NOI FEE			\$10.00	\$30.00
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C C T T T T T T T T T T T T T T T T T T					
		Palle	) D (%)		
OCT   2 1995		OCT   2 1995			

\$30.00

TOTAL \$ \_

DATE

#2643

RECEIVED BY

FEE ACCOUNT NO.

10/13/95/ek CK#30.00

CHECK NO.

CHIT NO. \_\_

IPS 1821 - Rev. 4/91

Carling and Sugar

#### ARIZONA DEPARTMENT OF WATER RESOURCES

15 South 15th Avenue Phoenix, Arizona 85007

# PROJECT COMPLETION REPORT FOR MINERAL EXPLORATION DRILLING

This report must be prepared by the <u>owner</u> in all detail for each hole drilled and filed with the Department within 30 days following completion of the well drilling project.

1.	Owner Name: USFS, Globe Ranger District
	Address: <u>Route 1, BOX 33</u> Globe AZ 85501 Street City State Zip
2.	Lessee or Operator Name: Kennecott Exploration Co.
	Address: 1802 W. Grant Rol. Suite 119 Tueson AZ 85745
	Street City State Zip
3.	Driller Name: Christensen Boyles Corp.
	Address: 6527 W. Northview Ave. Glendate AZ 85301
	Street City State Zip
4.	Location: $2$ $12$ $2$ $5$ $5E$ $1/4$ $NE$ $1/4$ $5W$ $1/4$ $Regional for the section for the$
	WELL REGISTRATION NO. 55- $552442$ (REQUIRED) DEC 20 1995
	DESCRIPTION OF WELL
5.	Type of Casing (if installed): 3/2" Casing, abandoned in READE Master 1292
6.	Abandonment method and material used if abandoned: Hole Was filled with heavy
	bentonite and plugged with 20' of Cement at the surface.
	1 00
	Was well abandoned in the course of drilling pursuant to R12-15-816, F.? Yes <u>V</u> No
7.	Date of period drilled: From: 10-22-95 To: 11-28-95
	LOG OF WELL
	Unconsolidated Formation
	Consolidated Formation DO NOT WRITE IN THIS SPACE OFFICE RECORD
	Depth to water in feet below land surface: <u>No</u>
I st	ate that this report is filed in compliance with A.R.S.
§45	-600 and is complete and correct to the best of my wledge and belief.
	File No.

Owner/Lessee's Signature

m

-0-Date

	ARIZONA DEPARTMENT OF WAT	<b>TR RESOUR</b>	DECEI	VED
	15 South 15th Aven Phoenix, Arizona 850	16	<b>APR</b> - 5	1996
	<b>PROJECT COMPLETION REPORT FOR MINER</b>	AL EXPLORA	TIORECEREN	G
	is report must be prepared by the <u>owner</u> in all detail for each ho days following completion of the well drilling project.	le drilled and fil	ed with the Depar	tment within
1.	Owner Name: Kennecott Exploration Comp	any		
	Address: 1802 W. Grant Rol. Swite 119 Street	<u>Thesa</u> City	<u>Az</u> State	85745 Zip
2.	Lessee or Operator Name:	bou		r
	Address:			
Q	Driller Name: <u>Christensen Boyles Corp.</u>	City	State	Zip
0.	Address: 6527 W. Northview Ave. (	Flendale	AZ S	15301
	Street	City	State	Zip
4.	Location: 2 12 FM 5 SW 1/4 NW Township Range Section 10-Acre 40-Ac		1	
	WELL REGISTRATION NO. 55-52442	(REQUIR	ED)	
	DESCRIPTION OF W			
5.	Type of Casing (if installed): $1730'of 4''$ Casing	All remo	wed.	
6.	Abandonment method and material used if abandoned:	eavy bento.	nitic mucht	m
	_ 2040' to 20'. 20' plag of (	cement at	- surface	
				· · · · · · · · · · · · · · · · · · ·
	Was well abandoned in the course of drilling pursuant to R12-	15-816, F.? Y	es/_ No	
7.	Date of period drilled: From: 1-19-96	_ То:2-	13-96	
	LOG OF WELL			
	Unconsolidated Formation	EDAPR 51	996	
	Consolidated Formation	OF	RITE IN THIS	SPACE
	Depth to water in feet below land surface: Not Deformined (if encountered or detected)	Registration N	ło	
Ict	ate that this report is filed in compliance with A.R.S.	Received	Ву	
§45	-600 and is complete and correct to the best of my wledge and belief.	Entered	Ву	
0		File No.		
	JanyWilking 4-2-96	L		

Owner/Lessee's Signature

\$

Date

• • • •	ARIZONA DEPARTMENT OF WA	TER RESOURCES	All	N R
•	15 South 15th Aver	\$ F	· ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Tal
	Phoenix, Arizona 85	007	2000	700 7/11
•- •	PROJECT COMPLETION REPORT FOR MINE	RAL EXPLORATION	DHILLAN	SF 1
	is report must be prepared by the <u>owner</u> in all detail for each h days following completion of the well drilling project.		h the Depa	rtment within
1.	Owner Name: Kennecott Exploration Com	npany		
	Address: 1802 W. Grant Rol. Suite 119 Street	Tucson City	AZ State	<u>85745</u> Zip
2.	Lessee or Operator Name:	above		
	Address:			
	Street	City	State	Zip
3.	Driller Name: <u>(Vistensen Boyles Corp.</u>	<u>()</u> 11		8=>
	Address: 6527 W. Northview Ave.	<u>City</u>	<u>AZ</u> State	<u>8530/</u> <sub>Zip</sub>
. 4.		E_1/4 <u>SW</u> 1/4		~
	Township Range Section 10-Acre 40-	Acre 160-Acre		
	WELL REGISTRATION NO. 55- <u>552442</u>	(REQUIRED)		
	DESCRIPTION OF V	WELL		
5.	Type of Casing (if installed): 1290' of 94mm Casing.	1280' vemoured,	10'le	HC 1280-129
6.	Abandonment method and material used if abandoned:	(Thick) feavy bentonitic	mud a	<u>HC 1280-</u> 29 5' +0 1800;'
	0-20' cement surface plug. 1	, ,		•
			* K	
	Was well abandoned in the course of drilling pursuant to R1	2-15-816, F.? Yes	No	
7.	Date of period drilled: From: 10-20-95	То: 11-28	-95	······
	LOG OF WELL			
	Unconsolidated Formation			
		DO NOT WRIT	E IN THIS	SPACE
	Consolidated Formation Depth to water in feet below land surface: <u>/00</u> (if encountered or detected)	OFFICE Registration No	RECORD	
	(in encountered of detected)			
	tate that this report is filed in compliance with A.R.S. 5-600 and is complete and correct to the best of my	Received Entered		
	owledge and belief.			
	1	File No	<u> </u>	
	How Wems 4/2/96	<b></b>		
Ow	ner/Lessed's Signature Date			

ARIZONA EXPLORATION WELL(s) FILING FEE \$10.00	DEPARTMENT OF WATER RES 15 South 15th Avenue Phoenix, Arizona 85007	OURCES EXPLORATION WELL(s) FILING FEE \$10.00
NOTICE OF INTENTIO	N TO DRILL AND ABANDON EX	PLORATION WELL(s)
	a <b>tutes, and Rule 12-15-817</b> provide: Pr m shall file a Notice of Intention to Drill or	
WELL/LAND LOCATION $\begin{array}{c c} & & & & & \\ \hline & & & & \\ \hline 1. & & & \\ \hline Township & Range & Section \\ \hline \\ In the case of a single well, list 10-acre subdivision. \\ \hline & & \\ \hline \hline & & \\ \hline & & \\ \hline & & \\ \hline & & \\ \hline \hline & & \\ \hline \hline & & \\ \hline & & \\ \hline \hline \\ \hline \hline & & \\ \hline \hline \\ \hline \hline \\ \hline \hline \hline \\ \hline \hline \hline \\ \hline \hline \hline \hline$	pursuant to this Notice: Mineral Exploration Geotechnical Cathodic Protection Grounding	DESCRIPTION OF THE WELL: Diameter <u>6</u> inches Depth <u>3000</u> feet Type of casing. If none, state: <u>Casing installed to 2000</u> ; <u>41/2" OD</u> . <u>Will be removed</u> <u>upon hole completion, if</u> privible.
		0. Construction will start
3. Kennecstt Exploration Co. Applicant Name	<u>USFS, Globe Ranger District</u> Name	<u>January 5 1996</u> Month Day Year
1802 W. Grant Rol. Switc 119 Address	<u>Route 1, Box 33</u> 1 Address	1. Drilling Firm:
Thuson AZ 85745 City State Zip	<u>Globe</u> AZ 85501 City State Zip	Christensen Boyles Corp. Name 16527 W. Northview Ave
4. <u>Toey Wilkins</u> Name of Contact Person	DO NOT WRITE IN THIS SPACE OFFICE RECORD File No. $D(2 - 12)$ 5 C D A	Address Glendlale AZ 85301
Phone 520 670 1311	Filed <u>/2-27.95</u> By <u>k</u>	City State Zip 28
Name <u>Samu as above</u> Address	DUPLICATE Mailed /-5-96 By	DWR License Number <u>Exploration</u> ROC License Category DED 1005 2. Period well will remain in use? <u>3</u> months <sup>PROVED</sup> J. Masek
<b>DEC 2 7 1995</b>	well(s) after project is completed: <u>//</u> Dw/	Rule R-12-15-816
	t of a septic tank system, sewage disposal a als or a petroleum storage area and tank	

#### GENERAL INSTRUCTIONS

- 1. Fill out this form in <u>DUPLICATE</u> and send <u>WITH \$10.00 FEE</u> to 15 South 15th Avenue, Phoenix, AZ 85007.
- 2. For specific instructions, limitations and conditions, see the reverse side of this form.

I state that this Notice is filed in compliance with Rule A.A.C. R12-15-809 and R12-15-816(F), and is complete and correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

u of Applicant/Owner Signature

25-95

NWD FF IN PARKA

#### CONDITIONS

- 1. Construction and abandonment standards for all wells shall be in accordance with A.A.C. Rules R12-15-811 and Rules R12-15-816.
- 2. Drilling of well(s) shall be completed within one (1) year after the date of Notice.
- 3. Mineral exploration, geotechnical, cathodic protection or grounding holes of 100 feet of depth or less do not apply to these provisions and do not require filing. However, if water is encountered during the drilling of these well(s), then the well(s) must be properly abandoned in accordance with Condition 1 above.
- 4. More than one well may be drilled under a single notice for mineral exploration and geotechnical wells so long as they are located within a single section.
- 5. A Project Completion Report and WELL ABANDONMENT COMPLETION REPORT must be filed for each mineral exploration hole within thirty (30) days of completion of drilling. A Well Driller Report for each hole drilled, must be filed by the driller within thirty (30) days of completion of drilling for geotechnical, cathodic protection and grounding.
- 6. The location of mineral exploration and geotechnical wells may be limited to the section. township and range. However, a complete legal description may be provided at the option of the well owner.
- 7. Pump equipment may not be installed on wells drilled for mineral exploration, geotechnical, cathodic proctection or grounding purposes.
- 8. Special construction standards required pursuant to R12-15-821:
- 9. To abandon a well in the course of drilling, the drilling contractor shall not remove the drilling rig from the well site, otherwise, a Notice of Intent to Abandon a Well must be filed prior to abandonment, and abandonment shall not commence until Department authority has been issued or, if during the course of drilling a well the Driller or owner elects to discontinue drilling and proceed with the abandonment of the well. The filing of a Well Abandonment Completion Report shall be filed within 30 days of abandonment, in accordance with R12-15-816.F.

DWR 55-435-7/91(Rev)

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	500 NORTH THIRD STREET PHOENIX, ARIZONA 85004-3903 (602) 417-2470 FAX (602) 417-2422 APR - 8 1996
	WELL ABANDONMENT COMPLETION REPORT
	RECORDS MGT M.S. §45-594; R12-15-816: Within 30 days after a well is abandoned, the well drilling contractor shall file a Well Abandonme mpletion Report on a form prescribed and furnished by the Director.
1.	Well Registration No. 55553490
2.	Well Location: $2 \times \sqrt{2} \times \sqrt{5} \times $
3.	Township Range Section 10 Acre 40 Acre 160 Acre Owner of the Well: Name: KENNECOTT Exploration CO.
	1802 W. GRANT RD. Suite 19 TUCSON AZ 8674
	Address City State 2
4.	Owner of the Land: Name:SAME_AS_ABOVE
	Address City State 2
5.	Well Description: 2798 3.032 2000'0F 4" (Outer Casing) (Inner Casing)
	Hole Depth Diameter Type of Casing Diameter Type of Casing
6.	Hole Depth Diameter Type of Casing Diameter Type of Casing Reason for abandonment: <u>Completed</u> Hole
7.	Reason for abandonment: <u>Completed</u> <u>Hole</u> Prior to abandonment, did the well have 20' of steel surface casing <u>AND</u> 20' of grout in the annular space surrounding the surface casing? Yes No_ <u>K</u>
7.	Reason for abandonment: Completed Hole. Prior to abandonment, did the well have 20' of steel surface casing AND 20' of grout in the annular space surrounding the surface casing? Yes No_K
7.	Reason for abandonment: <u>Completed</u> <u>Hole</u> Prior to abandonment, did the well have 20' of steel surface casing <u>AND</u> 20' of grout in the annular space surrounding the surface casing? Yes No_ <u>K</u> If the answer to No.?6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes <u>K</u> No Identify the materials and methods used to abandon the well: <u>THICK BENTONITE mud Geom 2798</u>
7. 8. 9.	Reason for abandonment: <u>Completed</u> Hole Prior to abandonment, did the well have 20' of steel surface casing <u>AND</u> 20' of grout in the annular space surrounding to surface casing? Yes No_ <u>X</u> If the answer to No. <sup>2</sup> 6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes_ <u>X</u> No Identify the materials and methods used to abandon the well: <u>Thick Bentowite mud Geom</u> 2798' <u>TO 20' TO SURFACE CEMENT Plub</u> .
7. 8. 9.	Reason for abandonment: <u>Completed</u> Hole Prior to abandonment, did the well have 20' of steel surface casing <u>AND</u> 20' of grout in the annular space surrounding the surface casing? Yes No_ <u>K</u> If the answer to No.?6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes <u>K</u> No Identify the materials and methods used to abandon the well: <u>THICK BENTONITE MUL FROM 2798'</u> <u>TO 20' <math>\int 20' TO</math> SURFACE CEMENT Plub</u> . Is this Abandonment Completion Report filed in accordance with R12-15-816, F.? Yes <u>K</u> No
7. 8. 9. 10.	Reason for abandonment: Completed Hole Prior to abandonment, did the well have 20' of steel surface casing AND 20' of grout in the annular space surrounding surface casing? Yes No_X If the answer to No.?6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes $X$ No Identify the materials and methods used to abandon the well: THICK BENTONITE mod Geom 2.798' TO 20' $f$ 20' TO SURFACE CEMENT Plub. Is this Abandonment Completion Report filed in accordance with R12-15-816,F.? Yes $X$ No How deep does the cement plug extend below land surface? $ZO'$
7. 8. 9. 10. 11.	Reason for abandonment: Completed Hole Prior to abandonment, did the well have 20' of steel surface casing AND 20' of grout in the annular space surrounding to surface casing? Yes No_X If the answer to No.?6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes $\nearrow$ No Identify the materials and methods used to abandon the well: THICK RENTENTIE mode George 2.798' TO 20' $\oint$ 20' TO SURFACE CEMENT Plub. Is this Abandonment Completion Report filed in accordance with R12-15-816,F.? Yes $\checkmark$ No How deep does the cement plug extend below land surface? 20' Was the well backfilled above the cement plug? Yes No
<ol> <li>7.</li> <li>8.</li> <li>9.</li> <li>10.</li> <li>11.</li> <li>12.</li> <li>13.</li> </ol>	Reason for abandonment: Completed Hole Prior to abandonment, did the well have 20' of steel surface casing AND 20' of grout in the annular space surrounding to surface casing? Yes No_K If the answer to No.?6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes $K$ No Identify the materials and methods used to abandon the well: Thick Report or ite mod from 2798' TO 20' $f$ 20' TO SURFACE CEMENT Plub. Is this Abandonment Completion Report filed in accordance with R12-15-816,F.? Yes_K_ No How deep does the cement plug extend below land surface? 20' Was the well backfilled above the cement plug? Yes No Date abandonment completed: 3-5-96
<ol> <li>7.</li> <li>8.</li> <li>9.</li> <li>10.</li> <li>11.</li> <li>12.</li> <li>13.</li> </ol>	Reason for abandonment: Completed Hole Prior to abandonment, did the well have 20' of steel surface casing AND 20' of grout in the annular space surrounding to surface casing? Yes No_X If the answer to No.?6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes $\nearrow$ No Identify the materials and methods used to abandon the well: THICK RENTENTIE mode George 2.798' TO 20' $\oint$ 20' TO SURFACE CEMENT Plub. Is this Abandonment Completion Report filed in accordance with R12-15-816,F.? Yes $\checkmark$ No How deep does the cement plug extend below land surface? 20' Was the well backfilled above the cement plug? Yes No
<ol> <li>7.</li> <li>8.</li> <li>9.</li> <li>10.</li> <li>11.</li> <li>12.</li> <li>13.</li> </ol>	Reason for abandonment: <u>Completed</u> <u>Hole</u> Prior to abandonment, did the well have 20' of steel surface casing <u>AND</u> 20' of grout in the annular space surrounding is surface casing? Yes No_ <u>X</u> If the answer to No. <sup>?</sup> 6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes <u>No</u> Identify the materials and methods used to abandon the well: <u>THick Rewrowite mod feern</u> 2:798' <u>TO 20' / 20' TO SURFACE CEMENT Plub</u> . Is this Abandonment Completion Report filed in accordance with R12-15-816,F.? Yes <u>No</u> How deep does the cement plug extend below land surface? <u>Z0'</u> Was the well backfilled above the cement plug? Yes No Date abandonment completed: <u>3-5-96</u> Drilling Firm: <u>CHRISTENSEN Boy/ES Corrector License No:</u> <u>28</u> <u>6527</u> W. Northview AVE. <u>Glendale</u> AZ <u>8536</u>
<ol> <li>7.</li> <li>8.</li> <li>9.</li> <li>10.</li> <li>11.</li> <li>12.</li> <li>13.</li> </ol>	Reason for abandonment: <u>Completed</u> <u>Hole</u> Prior to abandonment, did the well have 20' of steel surface casing <u>AND</u> 20' of grout in the annular space surrounding is surface casing? Yes No_ <u>X</u> If the answer to No.?6 is no, was the top 20' of casing removed prior to setting the cement plug? Yes <u>X</u> No Identify the materials and methods used to abandon the well: <u>Thick Reports of mode feern</u> 2798' <u>TO 20' f 20' TO SORFACE CEMENT plub</u> . Is this Abandonment Completion Report filed in accordance with R12-15-816,F.? Yes <u>X</u> No How deep does the cement plug extend below land surface? <u>20'</u> Was the well backfilled above the cement plug? Yes No Date abandonment completed: <u>3-5-96</u> Drilling Firm: Name: <u>CHRISTENSEN</u> <u>Boy/ES Correctorian</u> <u>License No:</u> 28

#### **ARIZONA DEPARTMENT OF WATER RESOURCES**

500 North Third Street, Phoenix, Arizona 85004 Telephone (602) 417-2470 Fax (602) 417-2422

January 5, 1996



FIFE SYMINGTON Governor

RITA P. PEARSON Director

KENNECOTT EXPLORATION CO. 1802 W. GRANT RD. S119 TUCSON, AZ. 85745

Re: Registration No. 55-553490

File No. D(2-12)5CDA

Dear Well Owner:

Enclosed for your records is an annotated copy of the Notice of Intention to Drill a well which was recently filed with this Department. This is returned to you as evidence of compliance with A.R.S. §45-596. Your designated driller has been mailed, separately, a Well Drilling Card which he is required to have in his possession before commencing to drill the well.

This well is authorized to be drilled for mineral exploration purposes. Because of this, no pump equipment may be installed. A Project Completion report is being furnished you for each hole to be drilled. You are required to submit this within 30 days after completion of drilling. Frequently, exploration wells are abandoned shortly after drilling. Per R12-15-816.F a Well Abandonment Completion Report must be submitted by the driller. The Department of Water Resources requires you to obtain written permission before proceeding with the drilling, in the event, that you determine it necessary to change the location of the proposed well. A properly signed amended Drilling Card must be in the possession of the driller before drilling commences at a different location.

For your <u>future</u> use, a Change of Well information form is enclosed for your convenience. Per A.R.S. §45-593, the person to whom a well is registered shall notify this Department of a change of ownership of the well and/or information pertaining to the physical characteristics of the well, in order to keep the well registration file current and accurate.

Sincerely,

Ellertane

Ellen Kane Water Resource Technician Groundwater Section

ARIZONA DEPARTMENT OF WATER RESOURCES Hydrology Division

500 North Third Street, Phoenix, Arizona 85004 Telephone (602) 417-2448 Fax (602) 417-2425

January 2, 1996

Kennecott Exploration Company 1802 West Grant Road, Suite 119 Tucson, Arizona 85745

Attn: Joey Wilkins

RE: Drilling Mineral Exploration in T2S, R12E, Section 5

Dear Mr. Wilkins:

Your Notice of Intention to Drill and Abandon Mineral Exploration Well(s) is <u>conditionally</u> approved, because you plan to re-enter for future investigations.

Per R12-15-817.B.1

"If an exploration well which is to be left open for re-entry at a later date encounters groundwater, it shall be cased and capped in accordance with <u>R12-15-811</u>, R12-15-812, and R12-15-822. The minimal length of surface seal shall be <u>either 20</u> feet, or <u>five feet into the first encountered</u> <u>consolidated formation</u>, whichever is less. If no groundwater is encountered, the well shall be cased, grouted and capped in such a manner so as to prevent contamination of the well bore from the surface."

Mineral exploration borehole(s) should not be used for purposes other than exploration. In the future, any variance request for conversion of mineral exploration borehole(s) to other purposes will not be approved.

If you have any questions, please contact Sharon Masek of my staff at (602) 417-2400 ext. # 7185.

Sincerely,

Avez Walloce

FIFE SYMINGTON Governor

RITA P. PEARSON

Director

Greg Wallace Chief Hydrologist

GW/SM/jh 502096

# RECEIPT

JOEY WILKINS 1802 W. GRANT RD. #119 TUCSON, AZ. 85745

#### STATE OF ARIZONA DEPARTMENT OF WATER RESOURCES 500 NORTH THIRD STREET PHOENIX, ARIZONA 85004 (602) 417-2405

25243

Nº

ENTRY CODE 55

and the second second

FILE NO. D (2-12) 5cda 553490

THRU

ITE	M DESCRIPTION	RATE	AMOUNT
NOI FEE			\$10.00
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	GAIDS		
	IPCILLE		
	JAN - 5 1996	6	
1/5/95/ek CK#1001			\$10.00
CHECK NO	_ FEE ACCOUNT NO	TOTAL \$	1. 1993. 
CHIT NO	_ RECEIVED BY	DATE	
IPS 1821 – Rev. 4/91		н 1. 1. с. с. с.	

#### ARIZONA DEPARTMENT OF WATER RESOURCES GROUNDWATER MANAGEMENT SUPPORT SECTION 500 North Third Street Phoenix, Arizona 85004-3903

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILL OPERATIONS

WELL REGISTRATION NO: 55-53490

AUTHORIZED DRILLER: CHRISTENSEN BOYLES CORP.

LICENSE NO: 28

NOTICE OF INTENTION TO DRILL A MINERAL EXPLORATION WELL HAS BEEN FILED WITH THE DEPARTMENT BY:

WELL OWNER: KE

KENNECOTT EXPLORATION CO.

The well(s) is/are to be located in the:

NE 1/4 of the SE 1/4 of the SW 1/4 Section 5 Township 2S Range 12E

No. of Wells in this project: 1

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE 26TH DAY OF DECEMBER, 1996.

CHIEF, GROUNDWATER MANAGEMENT SUPPORT

THE DRILLER MUST FILE A LOG OF THE WELL WITHIN 30 DAYS OF COMPLETION OF DRILLING



	n an	4	E.
ARIZONA DEPARTMENT OF WA	TER RESOURCE	S	
500 NORTH THIRD STRI PHOENIX, ARIZONA 8	EET      +	IPR - 5 1996	
PROJECT COMPLETION REPORT FOR MINE	RAL EXPLORATI	ON-DRIELED	ie –
This report must be prepared by the <u>owner</u> in all detail for each h 30 days following completion of the well drilling project.	nole drilled and filed	with the Depa	rtment-with
1. Owner Name: Kennecott Exploration Co.			
Address: 1902 W. Grant Rd. Suite 114 Street	7 Thesan City	A2 State	<u>85745</u> Zip
2. Lessee or Operator Name: Same_as_a	brue		
Address:	City	State	Zip
3. Driller Name: Christensen Royles Corp.			
Address: 6527 W. Northview Ave.	Glenolale	A2	85301
Sireei	City	State	Zip
4. Location: <u>2</u> 10 12 10 5 <u>NE</u> 1/4 <u>SE</u> Township Range Section 10-Acre 40-	<u>= 1/4 StJ 1/4</u> Acre 160-Acre		
WELL REGISTRATION NO. 55-553490	(REQUIREI	))	
DESCRIPTION OF			
<ul> <li>5. Type of Casing (if installed): <u>2000' of 4" st</u></li> <li>6. Abandonment method and material used if abandoned: <u>Ha</u></li> </ul>	teel. Remove	: upon hole	. Completion
6. Abandonment method and material used if abandoned:	(Thick) bentoni	tic much t	From
2798' to 20', 20' cerrent plug			
	· · · · · · · · · · · · · · · · · · ·		
Was well abandoned in the course of drilling pursuant to R1	2-15-816, F.? Yes	No_	
7. Date of period drilled: From:			
LOG OF WELL			
Unconsolidated Formation			
Consolidated Formation Depth to water in feet below land surface:	DO NOT WR OFFI Registration No	ICE RECORI	)
I state that this report is filed in compliance with A.R.S.	Received	By	
§45-600 and is complete and correct to the best of my knowledge and belief.	Entered ENTER File No	ED APR	5 1996
(L) ih			······································
tang Williams 4-2-96			

DWR-55-57-7/91(Rev)

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ARI	ZONA DEPARTMENT OF WA		<u>6 E I V</u> SAPR - 8 199	<u> </u>
<u></u>	500 NORTH THIRD STRE	ET		
	PHOENIX, ARIZONA 8	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	FCOKDO	MGT
PROJECT COMP	LETION REPORT FOR MINE	RAL EXPLORATI	ON DRILLIN	G
This report must be prepared by 30 days following completion of	y the <u>owner</u> in all detail for each h the well drilling project.	ole drilled and filed	with the Depar	rtment within
. Owner Name: <u>Kenne</u> s	Lott Exploration Co.			
Address: 1802 W.	Grant Rol. Suite 11	> Theson	Az	85745
Street		City	State	Zip
2. Lessee or Operator Name:	Same as a	bove		
Address:		1		·
Street		City	State	٦
3. Driller Name: Christ	tonien Boyles Corp.		· ·	
Address: 6527 W.	Northview Ave.	Glendale	Az	85301
Streel		City	State	Zip
Location: <u>~ BS /d</u>	<b>A</b>	Acro 160 Acro		
4. Location: <u>2</u> Township Rang WELL REGISTRATION NO	0. 55- <u>553490</u>	(REQUIRE:	נס	
WELL REGISTRATION NO	D. 55- <u>553490</u> DESCRIPTION OF 1	(REQUIRE: WELL		
WELL REGISTRATION NO	D. 55- <u>553490</u> DESCRIPTION OF 1	(REQUIRE: WELL		Competion
WELL REGISTRATION NO	0. 55- <u>553490</u>	(REQUIRE: WELL		Competion From
WELL REGISTRATION NG 5. Type of Casing (if installed) 5. Abandonment method and a	D. 55- <u>553490</u> DESCRIPTION OF T DESCRIPTION OF T DESCRIPT	(REQUIRE) WELL tect Remom (Thick) benton;	e upon hole. tic much t	Completion
WELL REGISTRATION NG 5. Type of Casing (if installed) 5. Abandonment method and a	D. 55- <u>553490</u> DESCRIPTION OF 1	(REQUIRE) WELL tect Remom (Thick) benton;	e upon hole. tic much t	Completion From
WELL REGISTRATION NG 5. Type of Casing (if installed) 5. Abandonment method and a 2793' + 320'	D. 55- 553490 DESCRIPTION OF $1$ $\therefore 2000' of 4'' st$ material used if abandoned: $\frac{H}{20'}$ 20' Coment play	(REQUIRE) WELL tell Remound (Thick) benton; eavy benton; at surfac	e upon hole tic much t	
WELL REGISTRATION NG 5. Type of Casing (if installed) 5. Abandonment method and a 2793' + 320'	D. 55- <u>553490</u> DESCRIPTION OF T : <u>2000' of 4" st</u> material used if abandoned: <u>H</u> 20' <u>Carr ent</u> <u>play</u> course of drilling pursuant to R1	(REQUIRE) WELL (Thick) benton; (Thick) benton;	e upon hole tic much t	
WELL REGISTRATION NG Type of Casing (if installed) Abandonment method and r 2793' + 20' Was well abandoned in the	D. 55- <u>553490</u> DESCRIPTION OF V : <u>2000' of 4" st</u> material used if abandoned: <u>Ha</u> <u>20' Carrent play</u> course of drilling pursuant to RI	(REQUIRE) WELL (Thick) benton; (Thick) benton;	e upon hole tic much t	
<ul> <li>WELL REGISTRATION NG</li> <li>Type of Casing (if installed)</li> <li>Abandonment method and a</li> <li>2793' 43 20'</li> <li>Was well abandoned in the</li> </ul>	D. 55- <u>553490</u> DESCRIPTION OF V : <u>2000' of 4" st</u> material used if abandoned: <u>Ha</u> <u>20' Carrent play</u> course of drilling pursuant to RI	(REQUIRE: WELL tect. Remound (Thick) bentoni at Surfac 2-15-816, F.? Yes To: <u>3-</u>	e upon hole tic much t	
<ul> <li>WELL REGISTRATION NO.</li> <li>Type of Casing (if installed)</li> <li>Abandonment method and a 2798' 43 20'</li> <li>Was well abandoned in the</li> <li>Date of period drilled: From</li> </ul>	D. 55- 553490 DESCRIPTION OF M = 2000' of 4'' st material used if abandoned: <u>Har</u> 20' Cerrent play course of drilling pursuant to RI n: 1-8-96 LOG OF WELL	(REQUIRE: WELL tect. Remound (Thick) bentoni at Surfac 2-15-816, F.? Yes To: <u>3-</u>	e upon hole tic much t	
<ul> <li>WELL REGISTRATION NG</li> <li>Type of Casing (if installed)</li> <li>Abandonment method and a</li> <li>2793' 43 20'</li> <li>Was well abandoned in the</li> </ul>	D. 55- 553490 DESCRIPTION OF M = 2000' of 4'' st material used if abandoned: <u>Har</u> 20' Cerrent play course of drilling pursuant to RI n: 1-8-96 LOG OF WELL	(REQUIRE: WELL tect. Remound (Thick) bentoni at Surfac 2-15-816, F.? Yes To: <u>3-</u>	e upon hole tic much t	
<ul> <li>WELL REGISTRATION NG</li> <li>Type of Casing (if installed)</li> <li>Abandonment method and a 2793' 43 20'</li> <li>Was well abandoned in the</li> <li>Date of period drilled: From</li> <li>Unconsolidated Forma</li> </ul>	D. 55- <u>553490</u> DESCRIPTION OF T 2000' of 4'' sf material used if abandoned: <u>His</u> 20' Carrent play course of drilling pursuant to RI n: $1-8-96$ LOG OF WELL mation	(REQUIRE: WELL (Thick) benton: (Thick) benton: at surfac 2-15-816, F.? Yes To: 3-	e upon hole tic much t No -5-96 RITE IN THIS	SPACE
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<ul> <li>WELL REGISTRATION NG</li> <li>Type of Casing (if installed)</li> <li>Abandonment method and in <u>2793' for 20'</u></li> <li>Was well abandoned in the</li> <li>Date of period drilled: From</li> <li>Unconsolidated Format Depth to water in fee (if encountered or dependence)</li> </ul>	D. 55- <u>553490</u> DESCRIPTION OF T 2000' of 4'' st material used if abandoned: <u>Has</u> 20' Carrent play course of drilling pursuant to RI n: $1-8-96$ LOG OF WELL mation ation ation t below land surface: <u>80</u> ' letected)	(REQUIRE: WELL (Thick) benton; (Thick) benton; at surfac 2-15-816, F.? Yes To: 3-	e upon hole tic much t 	SPACE
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ARIZONA	DEPARTMENT OF WATER RE	
EXPLORATION WELL(s)	15 South 15th Avenue	EXPLORATION WELL(s)
FILING FEE \$10.00	Phoenix, Arizona 85007	FILING FEE \$10.00
NOTICE OF INTENTIO	N TO DRILL AND ABANDON E	XPLORATION WELL(s)
Section §45-596, Arizona Revised St wells, the well owner, or exploration firm	<b>atutes, and Rule 12-15-817</b> provide: 'I n shall file a Notice of Intention to Drill	Prior to drilling one or more exploration on a form provided by the Department.
WELL/LAND LOCATION           2         12 (E)           1. Township         Range	6. Purpose of well(s) drilled pursuant to this Notice: Mineral Exploration	9. DESCRIPTION OF THE WELL: Diameter <u>5</u> inches Depth <u>2000'</u> feet Type of casing. If none, state:
In the case of a single well, list 10-acre subdivision.	Geotechnical Cathodic Protection Grounding/	Steel casing (5"0D), but temporary. 11/2" PVC
<u>NE_1/4 _NE_1/4 _SE_1/4</u> 10 ACRE 40 ACRE 160 ACRE	7. Number of wells / (See Condition 4 on reverse side)	for geophysicallogging.
2. County Pinal	8. Owner of Land of wellsite:	10. Construction will start
3. <u>Kennewitt Exploration</u> Applicant Name	U.S. Tonto National Faces Name (Globe Ranger District)	+ <u>Oct. 16 95</u> Month Day Year
<u>1802 W. Grant Rd. Suite 119</u> Address	<u>Route 1 Box 33</u> Address	11. Drilling Firm:
Tucson, AZ 85745 City State Zip	<u>Globe AZ 85501</u> City State Zip	Christensen Boyles Corp. Name
4. Joey Wilkins	DO NOT WRITE IN THIS SPACE	6527 West Northview Ave. Address
4. Jocy Wilkins Name of Contact Person	OFFICE RECORD File No. $D(2-/2) G D A A$	Glendale AZ 85301
Phone 520-670-1311	Filed 10-3-95 By sk	City State Zip
5. Owner of Well: <u>Same as above</u> Name	ENTEREDOCT 1 7 1995 DUPLICATE	DWR License Number Exploration
	Mailed 10-16-95 By	ROC License Category
Address	Registration 55-55-2444 AMA/INA Per	12. Period well will remain in use:
City State Zip	W/S <u>268</u> S/B <u>06</u>	
13. Proposed method of abandoment of	f well(s) after project is completed:i	in accordance with DWR

Vule R-12-15-816

14. Is the propsed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials or a petroleum storage area and tanks? Yes \_\_\_\_\_ No \_\_\_\_

#### GENERAL INSTRUCTIONS

- 1. Fill out this form in DUPLICATE and send WITH \$10.00 FEE to 15 South 15th Avenue, Phoenix, AZ 85007.
- 2. For specific instructions, limitations and conditions, see the reverse side of this form.

I state that this Notice is filed in compliance with Rule A.A.C. R12-15-809 and R12-15-816(F), and is complete and correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

9-29-95 Date

DWD FF (3 minim ....

Signature of Applicant/Owner Agent for Kennecott

#### CONDITIONS

- 1. Construction and abandonment standards for all wells shall be in accordance with A.A.C. Rules R12-15-811 and Rules R12-15-816.
- 2. Drilling of well(s) shall be completed within one (1) year after the date of Notice.
- 3. Mineral exploration, geotechnical, cathodic protection or grounding holes of 100 feet of depth or less do not apply to these provisions and do not require filing. However, if water is encountered during the drilling of these well(s), then the well(s) must be properly abandoned in accordance with Condition 1 above.
- 4. More than one well may be drilled under a single notice for mineral exploration and geotechnical wells so long as they are located within a single section.
- 5. A Project Completion Report and WELL ABANDONMENT COMPLETION REPORT must be filed for each mineral exploration hole within thirty (30) days of completion of drilling. A Well Driller Report for each hole drilled, must be filed by the driller within thirty (30) days of completion of drilling for geotechnical, cathodic protection and grounding.
- 6. The location of mineral exploration and geotechnical wells may be limited to the section, township and range. However, a complete legal description may be provided at the option of the well owner.
- 7. Pump equipment may not be installed on wells drilled for mineral exploration, geotechnical, cathodic proctection or grounding purposes.
- 8. Special construction standards required pursuant to R12-15-821:\_\_\_\_

<sup>9.</sup> To abandon a well in the course of drilling, the drilling contractor shall not remove the drilling rig from the well site, otherwise, a Notice of Intent to Abandon a Well must be filed prior to abandonment, and abandonment shall not commence until Department authority has been issued or, if during the course of drilling a well the Driller or owner elects to discontinue drilling and proceed with the abandonment of the well. The filing of a Well Abandonment Completion Report shall be filed within 30 days of abandonment, in accordance with R12-15-816.F.

GROUN	A DEPARIMENT OF WA DWATER MANAGEMENT S RTH THIRD STREET PHOENIX, A (602) 417-2470 FAX (602) 4	UPPORT SECTION E	G G U V G
WELL A	BANDONMENT COMP	LETION REPORT	DR - 8 1996
A.R.S. \$45-594; R12-15-816: Within 30 d Completion Report on a form prescribe			
1. Well Registration No. 55-52	-		
2. Well Location: <u>2</u> NS Township		NE & NE	<u> </u>
Township 3. Owner of the Well: Name:KENNECC			
1902 W. GRANT RD Address			85745 Zip
Address	City	State	Zip
4. Owner of the Land: Name:	AS ABOVE	·	
Address	City	State	Zip
5. Well Description: <u>2673'</u> <u>3</u> Hole Depth Di	.032 ZOO' OF 4" (Out ameter Type of Casing	er Casing) Diameter Type	(Inner Casing) of Casing
6. Reason for abandonment: Hole	completied		ения — Санала - Прина — Санала - Прина — Санала — Санала - Санала — С
7. Prior to abandonment, did the well surface casing? Yes NoX			
8. If the answer to No. 6 is no, was th	,		1
9. Identify the materials and methods	· · · · · · · · · · · · · · · · · · ·	I THICK ISENTONITE	FROM 25/3 TO
20', CEMENT PLUG F	rom 20' to surface		۵۰ <del>میں برد اور در در اور در در اور در در اور در در اور</del> ۱
10. Is this Abandonment Completion R	eport filed in accordance with R12	-15-816,F.? Yes_K_ No_	
11. How deep does the cement plug en	xtend below land surface?	<i>r</i>	
12. Was the well backfilled above the	cement plug? Yes No		
13. Date abandonment completed:			
14. Drilling Firm: Name: CHRISTENSEN	Boyles Coep.	License N	10: 28
6527 W. NORTHVIÈW Address	AVIE Glendale	AZ	85301
Address	City	State	Zip
DATE: 4-2-96 SIG	NATURE OF WELL DRILLER	UPIL	· · · · · · · · · · · · · · · · · · ·
DWR 55-58 (Rev 695ANCELL			•
VNIVLLL		FERED APR 1 0 1996	3

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	Solution and Solution		
ARIZONA DEPARTMENT OF WAT 15 South 15th Avenu Phoenix, Arizona 8500	e l	APR - {	8 1996
PROJECT COMPLETION REPORT FOR MINER		RECORD	2S MGT
is report must be prepared by the <u>owner</u> in all detail for each hol days following completion of the well drilling project.	e drilled and filled v	with the Depart	tment with
Owner Name: Kennecott Exploration Comp	bng		
Address: 1802 W. Grant Rd. Swite 119 Surcei	74Cson City	AZ. State	85745 Zip
Lessee or Operator Name: Some as a	bove.	•	
Address:			
Driller Name: Christensen Boyles Curp	City	State	Zip
Address: 6527 W. Northview Ave.	Colon D.L.	4.	85301
Address: 622/W. Notrin View MVE. Street	City	State	Zip
Location: 2 10 12 10 6 NE 1/4 NE	_1/4 <u>SE</u> 1/4		
Township Range Section 10-Acre 40-Ac	tre 160-Acre		
Township Range Section 10-Acre 40-Ac	Te 160-Acre	D)	
Township Range Section 10-Acre 40-Acre WELL REGISTRATION NO. 55- <u>55-2444</u>	(REQUIREI	D)	
Township Range Section 10-Acre 40-Acre WELL REGISTRATION NO. 55- <u>5524444</u> DESCRIPTION OF W	(REQUIRE)		1 + 200'
Township Range Section 10-Acre 40-Acre WELL REGISTRATION NO. 55- $5524444$ DESCRIPTION OF W Type of Casing (if installed): $200' of 4'' steel$	(REQUIRES ELL 1. Abandoned	<u>420' @ 50</u>	<u>'+0200'-</u>
Township Range Section 10-Acre 40-Acre	(REQUIRED ELL Abandoned ((Lizk) benton eavy benton	<u>420' @ 50</u>	10200'-
Township Range Section 10-Acre 40-Acre WELL REGISTRATION NO. 55- $5524444$ DESCRIPTION OF W Type of Casing (if installed): $200' of 4'' steel$	(REQUIRED ELL Abandoned ((Lizk) benton eavy benton	<u>420' @ 50</u>	to 200'- pumpet
Township Range Section 10-Acre 40-Acre	(REQUIRED ELL Abandoned ((Lizk) benton eavy benton	<u>420' @ 50</u>	1 to 200'- pumpet - face
Township Range Section 10-Acre 40-Acre 40-Acr	(REQUIRED ELL (Abandoned (Thick) benton Cary benton 20' cement f	120° Q. 80 nitic much Nuz at su	1 to 200' - pumpet
Township Range Section 10-Acre 40-Acre 40-Acre WELL REGISTRATION NO. 55- <u>5524444</u> DESCRIPTION OF W Type of Casing (if installed): <u>200' of 4" steel</u> Abandonment method and material used if abandoned: <u>4</u> <u>into hale from 2573' to 20'</u> .	(REQUIRE) ELL (· Abandoned (thick) benton eavy benton 20' cement f -15-816, F.? Yes	120° Q. 80 nitic much Nuz at su	- pumpet
Township Range Section 10-Acre 40-Acre WELL REGISTRATION NO. 55- <u>5524444</u> DESCRIPTION OF W Type of Casing (if installed): <u>200' of 4" steel</u> Abandonment method and material used if abandoned: <u>4</u> <u>into hale from 2573' to 20'</u> . Was well abandoned in the course of drilling pursuant to R12 Date of period drilled: From: <u>12-2-95</u>	(REQUIRED ELL (Abandoned (Thick) benton Cary benton 20' cement f	120° Q. 80 nitic much Nuz at su	- pumpet
Township Range Section 10-Acre 40-Acre 40-Acre WELL REGISTRATION NO. 55- <u>5524444</u> DESCRIPTION OF W Type of Casing (if installed): <u>200' of 4" steel</u> Abandonment method and material used if abandoned: <u>4</u> <u>into hale from 2573' to 20'</u> .	(REQUIRE) ELL (· Abandoned (thick) benton eavy benton 20' cement f -15-816, F.? Yes	120° Q. 80 nitic much Nuz at su	- pumpet
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Township Range Section 10-Acre 40-Acre 40-Acre WELL REGISTRATION NO. 55- <u>5524444</u> DESCRIPTION OF W Type of Casing (if installed): <u>200' of 4" strand</u> Abandonment method and material used if abandoned: <u>A</u> <u>into hole from 2573' to 20'</u> . <u>S</u> Was well abandoned in the course of drilling pursuant to R12 Date of period drilled: From: <u>12-2-95</u> LOG OF WELL Unconsolidated Formation	(REQUIRE) ELL . Abandoned (Thick) benton eavy benton 20' cement for -15-816, F.? Yes To:	$\frac{1}{100} \cdot \frac{1}{100} \cdot \frac{1}$	space
Township Range Section 10-Acre 40-Acre 40-Acre WELL REGISTRATION NO. 55- <u>5524444</u> DESCRIPTION OF W Type of Casing (if installed): <u>200' of 4" start</u> Abandonment method and material used if abandoned: <u>4</u> <u>into hole from 2573' to 20'</u> . Was well abandoned in the course of drilling pursuant to R12 Date of period drilled: From: <u>12-2-95</u> LOG OF WELL Unconsolidated Formation Depth to water in feet below land surface: <u>80'</u> (if encountered or detected)	(REQUIRE) ELL . Abandoned (Thick) benton eavy benton 20' cement for -15-816, F.? Yes To:	<u>120' Q. 80</u> ni tic mud Nuz at su <u>Nuz at su</u> <u>-25-96</u> RITE IN THIS TICE RECORD 0	space
Township Range Section 10-Acre 40-Ad WELL REGISTRATION NO. 55- <u>55-24444</u> DESCRIPTION OF W Type of Casing (if installed): <u>200' of 4" start</u> Abandonment method and material used if abandoned: <u>4</u> <u>into hale from 2573' to 20'</u> . Was well abandoned in the course of drilling pursuant to R12 Date of period drilled: From: <u>12-2-95</u> LOG OF WELL Unconsolidated Formation Depth to water in feet below land surface: <u>80</u> (if encountered or detected) state that this report is filed in compliance with A.R.S. 15-600 and is complete and correct to the best of my	(REQUIRED ELL . Abandoned (Thick) benton Carry benton 20' Cement for -15-816, F.? Yes To: DO NOT WE OFF Registration No	<u>25-96</u> RITE IN THIS -25-96 -25-96	SPACE
Township Range Section 10-Acre 40-Ad WELL REGISTRATION NO. 55- <u>55-24444</u> DESCRIPTION OF W Type of Casing (if installed): <u>200' of 4" steel</u> Abandonment method and material used if abandoned: <u>4</u> <u>into hale from 2573' to 20'</u> . Was well abandoned in the course of drilling pursuant to R12 Date of period drilled: From: <u>12-2-95</u> LOG OF WELL Unconsolidated Formation Depth to water in feet below land surface: <u>80</u> ' (if encountered or detected) state that this report is filed in compliance with A.R.S.	(REQUIRED ELL . Abandoned (Thick) benton eavy benton 20' cement for -15-816, F.? Yes To: DO NOT WE OFF Registration No Received	<u>20' Q. 80</u> <u>ni fic mud</u> <u>Nuz of su</u> <u>Nuz of su</u> <u>Nuz of su</u> <u>Nuz</u> <u>of su</u> <u>Nuz</u> <u>of su</u> <u>Nuz</u> <u>of su</u> <u>By</u> <u>By</u>	space
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2EMT BY: KENNECOT EXP TUCSON; 4- 3-96 9:12; 15206709775 => 16029395816;

#### ARIZONA DEPARTMENT OF WATER RESOURCES

500 North Third Street, Phoenix, Arizona 85004 Telephone (602) 417-2470 Fax (602) 417-2422

October 13, 1995



FIFE SYMINGTON Governor

RITA P. PEARSON Director

#### KENNECOTT EXPLORATION CO. 1802 W. GRANT RD. S119 TUCSON, AZ. 85745

Re: Registration No. 55-552442 THRU 55-552444

File No. VARIOUS

Dear Well Owner:

Enclosed for your records is an annotated copy of the Notice of Intention to Drill a well which was recently filed with this Department. This is returned to you as evidence of compliance with A.R.S. §45-596. Your designated driller has been mailed, separately, a Well Drilling Card which he is required to have in his possession before commencing to drill the well.

This well is authorized to be drilled for mineral exploration purposes. Because of this, no pump equipment may be installed. A Project Completion report is being furnished you for each hole to be drilled. You are required to submit this within 30 days after completion of drilling. Frequently, exploration wells are abandoned shortly after drilling. Per R12-15-816.F a Well Abandonment Completion Report must be submitted by the driller. The Department of Water Resources requires you to obtain written permission before proceeding with the drilling, in the event, that you determine it necessary to change the location of the proposed well. A properly signed amended Drilling Card must be in the possession of the driller before drilling commences at a different location.

For your <u>future</u> use, a Change of Well information form is enclosed for your convenience. Per A.R.S. §45-593, the person to whom a well is registered shall notify this Department of a change of ownership of the well and/or information pertaining to the physical characteristics of the well, in order to keep the well registration file current and accurate.

Sincerely,

Water Resource Technician Groundwater Section

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14		RECEI	PT -	Nº 2344	40	Anna an anna an an an an an an an an an a
	JOEY WILKINS 450 E. SMOOT TUCSON, AZ. 85705		50	STATE OF ARIZ MENT OF WATER NORTH THIRD HOENIX, ARIZONA (602) 417-240	RESOURCES STREET A 85004	
		E	NTRY CODE 5	5		
	FILE NO. VARIOUS	552442	THRU	552444		ting the state of
		ITEM DESCRIPTION		RATE	AMOUNT	
	NOI FEE	· · · · · · · · · · · · · · · · · · ·		\$10.00	\$30.00	
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	10/13/95/ek			TOTAL \$	\$30.00	
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#### ARIZONA DEPARTMENT OF WATER RESOURCES GROUNDWATER MANAGEMENT SUPPORT SECTION 500 North Third Street Phoenix, Arizona 85004-3903

	THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILL OPERATIONS					
	WELL REGISTRATION NO: 55-552444					
	AUTHORIZED DRILLER: CHRISTENSEN BOYLES CORP. LICENSE NO: 28					
	NOTICE OF INTENTION TO DRILL MINERAL EXPLORATION WELLS HAS BEEN FILED WITH THE DEPARTMENT BY:					
,	CONSULTANT:					
	WELL OWNER: KENNECOTT EXPLORATION					
	The well(s) is/are to be located in the:					
	NE 1/4 of the NE 1/4 of the SE 1/4 Section 6 Township 2S Range 12E					
	No. of wells in this project: 1					
	THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE 2ND DAY OF OCTOBER, 1996.					
Jo	CHIEF, GROUNDWATER MANAGEMENT SUPPORT					
	THE DRILLER MUST FILE A LOG OF THE WELL WITHIN 30 DAYS OF COMPLETION OF DRILLING					

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••••	ARIZONA DEPARTMENT OF V	VATER RESOLIRCES	RBIV	Enl
	15 South 15th Av	venue nE	660	
	Phoenix, Arizona	85007	100 - 51996	; UI
			APR	
	PROJECT COMPLETION REPORT FOR MIN	ERAL EXPLORATIO	N DRILLING	ACT
Tł	is report must be prepared by the <u>owner</u> in all detail for each	bole drilled and filed	FGAMBAR	ment within
30	days following completion of the well drilling project.		WELLING THE STREET	
	a i la tradata la	Antonia (A		
1.	Owner Name: Kennecott Exploration Co.	mfang		······································
	Address: 1902 W. Grant Rol. Swite 11 Street	9 Tucson	AZ	85745
	Street	City	State	Zip
0	Lessee or Operator Name: Same as	a lacala		
Z.	Lessee or Operator Name:	above		
	Address:	· · ·		
	Street	City	State	Zip
2	Driller Name: Christensen Boyles Cu	-0		
J.		/ / .	/	
	Address: 6527 W. Northview Ave.	Glendale	12	85301
	Street	City	State	Zip
٨	Location: _2 13 12 Em _6 _NE 1/4 _	NE 1/4 <u>SE 1/4</u>		
ч.	Township Range Section 10-Acre 4	0-Acre 160-Acre		
	WELL REGISTRATION NO. 55- <u>552444</u>	(REQUIRED)		
	DESCRIPTION OF	WELL		
5.	Type of Casing (if installed): $200' of 4'' states 4$ Abandonment method and material used if abandoned:	el; Abandoned 1	20 @ 30	to 200' -
6.	Abandonment method and meterial used if abandoned	HEAVY bentoni	tic much	Aunald
υ.				
	into hale from 2573' to 20'.	20' cement plu	g at sur	tall
		· · · · · · · · · · · · · · · · · · ·		
	Was well abandoned in the course of drilling pursuant to H	R12-15-816, F.? Yes	<u>/</u> No	•••••••••••
_				
7.	Date of period drilled: From: 12-2-95	To:/~~~,	5-76	
	LOG OF WEL	L		
	<b></b>			
	Unconsolidated Formation			
		DO NOT WRIT	TE IN TUTE O	TACE
	Consolidated Formation		E RECORD	SPACE
	Depth to water in feet below land surface: <u>80</u>			
	(if encountered or detected)	Registration No		
		Received	<b>B.</b> .	
I st	ate that this report is filed in compliance with A.R.S.			
§4{	5-600 and is complete and correct to the best of my	EnteredNTER	E By <u>APR</u>	<b>5 19</b> 95
kn	owledge and belief.	1711 NY		
		File No		·
	bus Willims 4-2-96	L		
		· ·		
Ow	ner/Lessee's Signature Date			

DWR-55-57-7/91(Rev)

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	ARIZONA DEPAR	South 15th Avenue			
· *		oenix, Arizona 8500			
PRO	JECT COMPLETION REPO	BT FOR MINER	AL EXPLORAT	YON DRIT LING	
30 days following	be prepared by the <u>owner</u> in all g completion of the well drilling	g project.		d with the Depart	ment with
1. Owner Name	:_ Kennecott Ceplaran	tion Company	/		
Address: Stre	1515 Mineral Square	Salt	City	State State	7//2_ Zip
2. Lessee or Ope	erator Name:Sam	n as above			
Address:					
Stre	1		City	State	Zip
	: Christensen Boyles		01 2		
Address:	6527 West North	view Ave	Glendale		85301
	< c			State	Zip
4. Location: <u>~</u> Tov	wnship Range Section	1/4 10-Acre 40-Acr	_1/41/4 re 160-Acre		
WELL REGIS	STRATION NO. 55- <u>54642</u>	-			
	STRATION NO. $55-5-7-72-72-72-72-72-72-72-72-72-72-72-72-7$	L	(REQUIRI	ED)	
		CRIPTION OF WE	_	ED) .also, addend	um)
	DESC	CRIPTION OF WE	ELL (See	also, addend	
5. Type of Casin	DESC og (if installed): $\frac{3\frac{1}{2}}{steel + t}$	CRIPTION OF WE	ELL (See , 3 <sup>1/2<sup>11</sup>sterl 7</sup>	also, addend to 1033 ' in hole #	2 bothre
<ol> <li>Type of Casin</li> <li>Abandonment</li> </ol>	DESC og (if installed): $\frac{3\frac{1}{2}}{steel+4}$ t method and material used if	CRIPTION OF WE 870'in hole#1 abandoned: <u>Hole</u> #	ELL (See , 3 <sup>1/2<sup>11</sup>sterl 7 <sup>#</sup>1 Was growt.</sup>	also, addend b 1033'in hole # cd with cemen	2 both re
<ol> <li>Type of Casin</li> <li>Abandonment</li> <li>1975 +</li> </ol>	DESC og (if installed): $\frac{3\frac{1}{2}'' start + 4}{1}$ t method and material used if surface. Hole # 2 1	CRIPTION OF WE 870'n hole#1 abandoned: <u>Hole</u> # Nas growted t	ELL (See , 3 <sup>1/2<sup>11</sup>stell 7 # 1 Was growth For cround</sup>	also, addend 5 1033' in hole # ad with Cement 1700' to the second sec	2, both re the
<ol> <li>Type of Casin</li> <li>Abandonment</li> <li>1975 +</li> </ol>	DESC og (if installed): $\frac{3\frac{1}{2}}{steel+4}$ t method and material used if	CRIPTION OF WE 870'n hole#1 abandoned: <u>Hole</u> # Nas growted t	ELL (See , 3 <sup>1/2<sup>11</sup>stell 7 # 1 Was growth For cround</sup>	also, addend 5 1033' in hole # ad with Cement 1700' to the second sec	2, both re the
<ol> <li>Type of Casin</li> <li>Abandonment</li> <li><u>1975' +o</u></li> <li><u>Surface</u></li> </ol>	DESC og (if installed): $\frac{3\frac{1}{2}'' start + 4}{1}$ t method and material used if surface. Hole # 2 1	CRIPTION OF WE 870'in hole#1 abandoned: <u>Hole</u> # Jas groated + + 1600'of zys	ELL (See , 3 <sup>1/2<sup>11</sup>sterl 7 <sup>4</sup>1 Was growt for cround <sup>21</sup> drilling st</sup>	also, addend b 1033' in hole # cd with Cemen 1700' to the cel was lost in	2, both re the
<ol> <li>Type of Casin</li> <li>Abandonment</li> <li><u>1975' to</u></li> <li><u>Surface</u></li> <li>Was well abar</li> </ol>	DESC ig (if installed): $\frac{3\frac{1}{2} + \frac{1}{3}\frac{1}{2} + \frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac$	CRIPTION OF WE 870'in hole#1 abandoned: <u>Hole</u> # Jas groated 7 + 1600' of 2% g pursuant to R12-1	ELL. (See , <u>3<sup>1</sup>/2<sup>11</sup>sterl</u> 7 + 1 Was growt for cround o <sup>11</sup> drilling st 15-816, F.? Ye	also, addend b 1033 'in hole # cd with Cemen 1700' to the cel was lost in sev No	2 bothro to Fram the the both the hole
<ol> <li>Type of Casin</li> <li>Abandonment</li> <li><u>1975' to</u></li> <li><u>Surface</u></li> <li>Was well abar</li> </ol>	DESC ing (if installed): $3\frac{3}{2}$ "steel + t method and material used if surface. Hole # 2 with cenert. About indoned in the course of drilling d drilled: From: $1-4-4$	CRIPTION OF WE 870'in hole#1 abandoned: <u>Hole</u> # Jas groated 7 + 1600' of 2% g pursuant to R12-1	ELL. (See , <u>3<sup>1</sup>/2<sup>11</sup>sterl</u> 7 + 1 Was growt for cround o <sup>11</sup> drilling st 15-816, F.? Ye	also, addend 1033 'in hole # ad with cemen 1700 ' to : eel was lost in is <u>No</u> BCEE	2 bothro the from the both the both the hole I V E
<ol> <li>Type of Casin</li> <li>Abandonment         <u>1975' +o</u> <u>Sur face</u>         Was well abar</li> <li>Date of period</li> </ol>	DESC ing (if installed): $3\frac{3}{2}$ "steel 4 t method and material used if surface. Hole # 2 c with cement. About indoned in the course of drillin d drilled: From: $1-4-4$	CRIPTION OF WE abandoned: $\frac{Hole^{4}}{Hole^{4}}$ Jas growted f $+ 1600' of 2%g pursuant to R12-135$	ELL. (See , <u>3<sup>1</sup>/2<sup>11</sup>sterl</u> 7 + 1 Was growt for cround o <sup>11</sup> drilling st 15-816, F.? Ye	also, addend b 1033 'in hole # cd with Cemen 1700' to the cel was lost in sev No	2 bothro the from the both the both the hole I V E
<ol> <li>Type of Casin</li> <li>Abandonment         <u>1975' +o</u> <u>Sur face</u>         Was well abar</li> <li>Date of period</li> </ol>	DESC ing (if installed): $3\frac{3}{2}$ "steel + t method and material used if surface. Hole # 2 with cenert. About indoned in the course of drilling d drilled: From: $1-4-4$	CRIPTION OF WE abandoned: $\frac{Hole^{4}}{Hole^{4}}$ Jas growted f $+ 1600' of 2%g pursuant to R12-135$	ELL. (See , <u>3<sup>1</sup>/2<sup>11</sup>sterl</u> 7 <u>+</u> 1 Was growt. <u>+</u> Was growt. <u>+</u> Wound <u>+</u> Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wound + Wo	also, addend b 1033 'in hole # ad with cemen 1700 ' to cel was lost in s K No B E E OPECANT	2 both re t From the both the both the hole 1995
<ul> <li>5. Type of Casin</li> <li>6. Abandonment</li> <li><u>1975' + 5</u></li> <li><u>Surface</u></li> <li>Was well abar</li> <li>7. Date of period</li> <li>Uncor</li> <li>Uncor</li> </ul>	DESC ing (if installed): $3\frac{3\frac{1}{2}}{stal + 4}$ t method and material used if <u>surface</u> . <u>Hole # 2 u</u> <u>with cenert</u> . <u>About</u> indoned in the course of drillin id drilled: From: <u>1-4-4</u> is insolidated Formation	CRIPTION OF WE abandoned: <u>Hole</u> # Jas groated + <u>+ 1600' of 2</u> % g pursuant to R12- 35 LOG OF WELL	ELL (See , <u>3<sup>1</sup>/2<sup>11</sup>sterl</u> 7 <u>+</u> 1 Was growt <u>+</u> Was growt <u>+</u> <del>-</del> <del>Com</del> ereund <u>+</u> <del>-</del> <del>drilling st</del> 15-816, F.? Ye _ To: <u>3-</u>	also, addend b 1033' in hole # ad with cement 1700' to cel was lost in s No No E Mar = 1	2 both re t From the both the both the hole 1995
<ul> <li>5. Type of Casin</li> <li>6. Abandonment</li> <li><u>1975' +o</u></li> <li><u>Sur face</u></li> <li>Was well abar</li> <li>7. Date of period</li> <li>Uncor</li> <li>Consc Depth</li> </ul>	DESC ing (if installed): $3\frac{3\frac{1}{2}}{\frac{1}{5}\frac{1}{5}\frac{1}{6}\frac{1}{4}\frac{1}{4}}$ t method and material used if <u>surface.</u> <u>Hole # 2 to</u> <u>with cenert.</u> <u>About</u> indoned in the course of drillin ind drilled: From: <u>1-4-4</u> is insolidated Formation blidated Formation is to water in feet below land surface	CRIPTION OF WE abandoned: <u>Hole</u> # Jas groated + <u>+ 1600' of 2%</u> g pursuant to R12-3 SC LOG OF WELL	ELL. (See , <u>3<sup>1</sup>/2<sup>11</sup>sterl</u> 7 <u>4</u> 1 Was growt For cround <sup>21</sup> drilling st 15-816, F.? Ye _ To: <u>3</u> -	also, addenne 1033 'ruhole # 1033 'ruhole # 1700 ' to : 1700 ' to	2, both re Fram the the both the both the hote 1995 1995 1995
<ul> <li>5. Type of Casin</li> <li>6. Abandonment</li> <li><u>1975' +o</u></li> <li><u>Sur face</u></li> <li>Was well abar</li> <li>7. Date of period</li> <li>Uncor</li> <li>Uncor</li> <li>Depth</li> <li>(if end</li> <li>water. Hole #</li> </ul>	DESC ing (if installed): $3\frac{3}{2}$ "steel 4 t method and material used if surface. Hole # 2 to with cenent. About indoned in the course of drillin ind drilled: From: $1-4-4$ is insolidated Formation blidated Formation a to water in feet below land surface countered or detected) a formation blidated Formation of 126	CRIPTION OF WE abandoned: $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$ $\frac{Hole}{Hole}$	ELL (See , <u>3<sup>1</sup>/2<sup>11</sup>ster</u> / 7 <del>4</del> / Was growt For Ground <sup>21</sup> drilling st 15-816, F.? Ye _ To: <u>3-</u> DO NOT W OF Registration N	also, addenne 1033 'ruhole # 1033 'ruhole # 1700 ' to : 1700 ' to	2, both re Fram the the both the both the hote 1995 1995 1995
<ul> <li>5. Type of Casin</li> <li>6. Abandonment</li> <li><u>1975' +o</u></li> <li><u>Surface</u></li> <li>Was well abar</li> <li>7. Date of period</li> <li>Uncor</li> <li>Consc</li> <li>Depth</li> <li>(if end</li> <li>water. Hole#</li> <li>I state that this r</li> </ul>	DESC ing (if installed): $3\frac{3}{2}$ "steel 4 t method and material used if surface. $Hole # 2$ is with cenent. About indoned in the course of drillin indoned in the course of drillin d drilled: From: $1-4-4$ is insolidated Formation blidated Formation is to water in feet below land surface countered or detected) @ (2 1 became avtesian of 126 zzo' > hole # 2, mine with report is filed in compliance with	CRIPTION OF WE abandoned: $\frac{Hole^{4}}{hole^{4}}$ abandoned: $\frac{Hole^{4}}{hole^{4}}$ $\frac{Hole^{4}}{hole^{4}}$ g pursuant to R12-1 35 LOG OF WELL ace: $\frac{1}{100} \frac{1}{100} $	ELL (See , <u>3<sup>1</sup>/2<sup>11</sup>steil 7</u> <u>+</u> 1 Was grout of <u>For cround</u> <u>+ drilling st</u> 15-816, F.? Ye _ To: <u>3</u> - DO NOT W OF Registration N Received	also, addenne b 1033 'ruhole # ad with Cemen 1700 ' to : cel was lost in s No By By	2, both re Fram the the both the both the hote 1995 1995 1995
<ul> <li>5. Type of Casin</li> <li>6. Abandonment</li> <li><u>1975' +o</u></li> <li><u>Surface</u></li> <li>Was well abar</li> <li>7. Date of period</li> <li>Uncor</li> <li>Consc</li> <li>Depth</li> <li>(if end</li> <li>water. Hole#</li> <li>I state that this r</li> </ul>	DESC og (if installed): $3\frac{3}{2}$ 'steel 4 t method and material used if surface. $Hole # 2$ t with cenert. About ndoned in the course of drillin d drilled: From: $1-4-4$ is nsolidated Formation blidated Formation to water in feet below land surface countered or detected) @ 6 $f_1$ became artesian of 126 zzo' > hole # Z, mine wite report is filed in compliance wite complete and correct to the	CRIPTION OF WE abandoned: $\frac{Hole^{4}}{hole^{4}}$ abandoned: $\frac{Hole^{4}}{hole^{4}}$ $\frac{Hole^{4}}{hole^{4}}$ g pursuant to R12-1 35 LOG OF WELL ace: $\frac{1}{100} \frac{1}{100} $	ELL. (See , <u>3<sup>1</sup>/2<sup>11</sup>steil 7</u> <u>+</u> 1 Was growt <u>For cround</u> <u>s<sup>11</sup> drilling st</u> 15-816, F.? Ye _ To: <u>3</u> - DO NOT W OF: Registration N Received Entered	also, addenne b 1033 ' in hole # ad with Cemen 1700 ' to : cel was lost in s No is No is No real was lost in No By By	2 both re the from the both the both the both 1995 1995 SPACE
<ul> <li>5. Type of Casin</li> <li>6. Abandonment</li> <li><u>1975' +o</u></li> <li><u>Surface</u></li> <li>Was well abar</li> <li>7. Date of period</li> <li>Uncor</li> <li>Consc</li> <li>Depth</li> <li>(if end</li> <li>water. Hole#</li> <li>e :</li> <li>i state that this r</li> <li>§45-600 and is d</li> </ul>	DESC og (if installed): $3\frac{3}{2}$ 'steel 4 t method and material used if surface. $Hole # 2$ t with cenert. About ndoned in the course of drillin d drilled: From: $1-4-4$ is nsolidated Formation blidated Formation to water in feet below land surface countered or detected) @ 6 $f_1$ became artesian of 126 zzo' > hole # Z, mine wite report is filed in compliance wite complete and correct to the	CRIPTION OF WE abandoned: $\frac{Hole^{4}}{hole^{4}}$ abandoned: $\frac{Hole^{4}}{hole^{4}}$ $\frac{Hole^{4}}{hole^{4}}$ g pursuant to R12-1 35 LOG OF WELL ace: $\frac{1}{100} \frac{1}{100} $	ELL. (See , <u>3<sup>1</sup>/2<sup>11</sup>steil 7</u> <u>+</u> 1 Was growt <u>For cround</u> <u>s<sup>11</sup> drilling st</u> 15-816, F.? Ye _ To: <u>3</u> - DO NOT W OF: Registration N Received Entered	also, addenne b 1033 'ruhole # ad with Cemen 1700 ' to : cel was lost in s No By By	2 both re the from the both the both the both 1995 1995 SPACE

AKIZUNA	DEPARTMENT OF WATER AG	AC 1-2				
AKIZONA DEPARTMENT OF WATER BERREN WR EXPLORATION WELL(s) 15 South 15th Avenue EXPLORATION WELL(s)						
FILING FEE \$10.00	Phoenix, Arizona 85007 D	EC 2 0 1994 FILING FEE \$10.00				
NOTICE OF INTENTIO	N TO DRILL AND ABANDON	EXPLORATION WELL(s)				
Section §45-596, Arizona Revised St wells, the well owner, or exploration firm		Prior to drilling one or more exploration l on a form provided by the Department.				
WELL/LAND LOCATION	6. Purpose of well(s) drilled pursuant to this Notice:	9. DESCRIPTION OF THE WELL: Diameter inches				
1. Township Range Section	Mineral Exploration $\underline{\times}$	Depthfeet Type of casing. If none, state:				
In the case of a single well, list	Geotechnical Cathodic Protection	-none-				
10-acre subdivision. 1/4 1/4 1/4	Grounding 7. Number of wells 2	······································				
10 ACRE 40 ACRE 160 ACRE	(See Condition 4 on reverse side)					
2. County_PinAL	8. Owner of Land of wellsite:	10. Construction will start				
3. <u>Kenne cott</u> <u>EXPLORATION</u> Applicant Name	<u>U.S. Tonto N. Forest</u> Name	December 26 1994 Month Day Year				
1515 Mineral SQ		11. Drilling Firm:				
Address	Address	,				
SALT LAKE CITY, UT 84112 City State Zip	<u>City State Zip</u>	Christensen Boyles Corp. Name				
4. Linus KeATING	DO NOT WRITE IN THIS SPACE OFFICE RECORD	6527 West Northview Ave. Address				
Name of Contact Person Phone_ <u>801-322-8345</u>	File No. <b>(2-/2)</b> Filed <b>/2-20-94</b> By	<u>Glendale AZ 85301</u> City State Zip				
5. Owner of Well:		194 28				
SAME AS Above	DUPLICATE	DWR License Number <u>Exploration</u>				
Address	Mailed 12-23-99 By 4 Registration 55-546429	ROC License Category 12. Period well will remain in use:				
City State Zip	AMA/INA Phy W/S 2 9 S/B 66	<u>-1-</u> months				
		1 and a south				
13. Proposed method of abandoment of well(s) after project is completed: in <u>accordance</u> with						
DWR Rule R-12	-15-816.	· · · · · · · · · · · · · · · · · · ·				

14. Is the propsed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials or a petroleum storage area and tanks? Yes \_\_\_\_\_ No \_\_\_\_ or storage area of hazardous materials or a petroleum storage area and tanks?

### GENERAL INSTRUCTIONS

- Fill out this form in <u>DUPLICATE</u> and send <u>WITH \$10.00 FEE</u> to 15 South 15th Avenue, Phoenix, AZ 85007.
   For specific instructions, limitations and conditions, see the reverse side of this form.

I state that this Notice is filed in compliance with Rule A.A.C. R12-15-809 and R12-15-816(F), and is complete and correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

DWR 55-43-7/91/ Rev 1

Signature of Applicant/Owner Agent for Kennecott

## CONDITIONS

- 1. Construction and abandonment standards for all wells shall be in accordance with A.A.C. Rules R12-15-811 and Rules R12-15-816.
- 2. Drilling of well(s) shall be completed within one (1) year after the date of Notice.
- 3. Mineral exploration, geotechnical, cathodic protection or grounding holes of 100 feet of depth or less do not apply to these provisions and do not require filing. However, if water is encountered during the drilling of these well(s), then the well(s) must be properly abandoned in accordance with Condition 1 above.
- 4. More than one well may be drilled under a single notice for mineral exploration and geotechnical wells so long as they are located within a single section.
- 5. A Project Completion Report and WELL ABANDONMENT COMPLETION REPORT must be filed for each mineral exploration hole within thirty (30) days of completion of drilling. A Well Driller Report for each hole drilled, must be filed by the driller within thirty (30) days of completion of drilling for geotechnical, cathodic protection and grounding.
- 6. The location of mineral exploration and geotechnical wells may be limited to the section, township and range. However, a complete legal description may be provided at the option of the well owner.
- 7. Pump equipment may not be installed on wells drilled for mineral exploration, geotechnical, cathodic proctection or grounding purposes.
- 8. Special construction standards required pursuant to R12-15-821:\_\_\_\_\_

<sup>9.</sup> To abandon a well in the course of drilling, the drilling contractor shall not remove the drilling rig from the well site, otherwise, a Notice of Intent to Abandon a Well must be filed prior to abandonment, and abandonment shall not commence until Department authority has been issued or, if during the course of drilling a well the Driller or owner elects to discontinue drilling and proceed with the abandonment of the well. The filing of a Well Abandonment Completion Report shall be filed within 30 days of abandonment, in accordance with R12-15-816.F.

## **ARIZONA DEPARTMENT OF WATER RESOURCES**

500 N 3RD. ST., PHOENIX, AZ. 85004 Telephone (602) 417-2470 Fax (602) 417-2401

December 22, 1994



FIFE SYMINGTON Governor

RITA P. PEARSON Director

KENNECOTT CORP. 1515 MINERAL SQ. SALT LAKE CITY, UT. 84112

Re: Registration No. 55-546429

File No. D(2-12)8

Dear Well Owner:

Enclosed for your records is an annotated copy of the Notice of Intention to Drill a well which was recently filed with this Department. This is returned to you as evidence of compliance with A.R.S. §45-596. Your designated driller has been mailed, separately, a Well Drilling Card which he is required to have in his possession before commencing to drill the well.

This well is authorized to be drilled for mineral exploration purposes. Because of this, no pump equipment may be installed. A Project Completion report is being furnished you for each hole to be drilled. You are required to submit this within 30 days after completion of drilling. Frequently, exploration wells are abandoned shortly after drilling. Per R12-15-816.F a Well Abandonment Completion Report must be submitted by the driller. The Department of Water Resources requires you to obtain written permission before proceeding with the drilling, in the event, that you determine it necessary to change the location of the proposed well. A properly signed amended Drilling Card must be in the possession of the driller before drilling commences at a different location.

For you <u>future</u> use, a Change of Well information form is enclosed for your convenience. Per A.R.S. §45-593, the person to whom a well is registered shall notify this Department of a change of ownership of the well and/or information pertaining to the physical characteristics of the well, in order to keep the well registration file current and accurate. For additional information you may contact Operations Division at (602)542-1581.

Sincerely,

Ellen 6. Lane

Ellen C. Kane Groundwater Permit Specialist

# RECEIPT

3. NTLEI'S 450 F. SCOOT FUCEOP, AZ. 05705 STATE OF ARIZONA DEPARTMENT OF WATER RESOURCES OPERATIONS DIVISION 15 SOUTH 15TH AVENUE PHOENIX, ARIZONA 85007 (602) 542-1581

15730

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FILE NO. D-2-12) 546429

THRU

· · · · · · · · · · · · · · · · · · ·	ITEM DESCRIPTION	RATE	AMOUNT
FILING FER FOR 7	OI TO DRILL WELLS		\$10.00
10	910-J		
	anns		
	DFC 2 2 1994		
P			
in the second	A street and the state of the s		
12/22/14/ek CR	2335		\$30.00
CHECK NO	FEE ACCOUNT NO	TOTAL \$	
CHIT NO	RECEIVED BY	DATE	······································

IPS 1821 - Rev. 4/91

ARIZONA D	EPARTMENT OF WATER RESC OPERATIONS DIVISION 500 North Third Street Phoenix, Arizona 85004-3903	
	Phone (602) 417-2470	PLICATE
THIS AUTHORIZATION SHALL	BE IN POSSESSION OF THE DRILLER DURING ALL	DRILL OPERATIONS
WELL REGISTRAT	ION NO. 55-546429	
AUTHORIZED DRILLER: BOYLE	S BROS. DRILLING CO. LICENS	ENO. 28
NOTICE OF INTENTION TO DRILL	A MINERAL EXPLORATION WELL HAS BEEN FILED	WITH THE DEPARTMENT B
Owner of Well(s) KENNECOTT EXPLORATION	1515 MINERAL SQ. SALT I	AKE CITY UT 84112
The well(s) is/are to be located 1/4 1/4 1/4 10 acre 40 acre 160 acre		ange 12.0 EAST
NUMBER OF WELLS IN PROJECT	2	
	THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON D	EC 19TH, 1995
	THE DRILLER SHALL FILE A LOG OF THE WELL W COMPLETION OF DRILLING.	ITHIN 30 DAYS OF
	CHIEF, OPERATIO	

19 19 19 1-0 1° 1°

Addendum

4-21-95

Well vegistration NO. 55-546429

Prill hole # 1 contains two holes in one. The first hole Was drilled to 1545' but was blocked-off at 870' by a mass of 14 gauge Plastic coated wire. The wire was placed into the drill hole during a down hole IP geophysical survey. In addition to the lors of nearly 3500' of this type of wire, four electrodes were also lost. These electrodes were fabricated from 3'×1" PVC pipe wrapped in a lead blanket and filled with lead shot. This first hole was abandaned at 870'. A wedge was placed at 848' and a new hole began from that point to a final depth of 1975'. The artesian flowwas completely sealed-off.

Drill hole # 2 was lost at 3243', but only 1700' of BX pipe (21/8" steel) was vecovered after several othern pts. That The hole was abandoned with cement gront starting at the top of the pipe that was not recovered to the surface. The void from the top of the abandoned pipe to the holes final depth of 3243' may have, in part, been partially grouted as the material was forced down the hole from 1700'.

Joey Wilkins Kenneco H Gyplora tion

If there are any questions, please Call me at box 690 0289 in Tush, Az



ARIZONA DEPARTMENT OF WATER RESOURCES								
EXPLORATION WELL(s)	15 South 15th Avenue	EXPLORATION WELL(s)						
FILING FEE \$10.00	Phoenix, Arizona 85007	OCT - 3 199911NG FEE \$10.00						
NOTICE OF INTENTIO	N TO DRILL AND ABANDON F	<u>EXPLORATION WELL(s)</u>						
Section §45-596, Arizona Revised Statutes, and Rule 12-15-817 provide: Prior to drilling one or more exploration wells, the well owner, or exploration firm shall file a Notice of Intention to Drill on a form provided by the Department.								
WELL/LAND LOCATION          Image       I	6. Purpose of well(s) drilled pursuant to this Notice: Mineral Exploration Geotechnical Cathodic Protection Grounding	9. DESCRIPTION OF THE WELL: Diameter 5 inches Depth 3500' feet Type of casing. If none, state: <u>Steel Casing (5" OD) if necessary</u> , but temporary. 1/2" PVC						
$\frac{NW}{10 \text{ ACRE}} \frac{14}{40 \text{ ACRE}} \frac{NW}{160 \text{ ACRE}} \frac{14}{160 \text{ ACRE}}$	(See Condition 4 on reverse side)	for geophysical logging.						
2. County Pinal 3. <u>Kennecott Exploration Co.</u> Applicant Name	8. Owner of Land of wellsite: <u>USFS, Globe Ranger Distri</u> Name	10. Construction will start <i>Oct.</i> 16 95 <u>Month</u> Day Year						
<u>1802 W. Grant Rd. Suite/19</u> Address <u>Tucson Az</u> 85745 City State Zip	Routel Box 33 Address <u>Globe AZ 85501</u> City State Zip	11. Drilling Firm: <u>Cristensen Bayles Corp.</u> Name						
4. Joey Wilkins Name of Contact Person	DO NOT WRITE IN THIS SPACE OFFICE RECORD File No. D(2 - 12-19 BBP)	6527 W. Northview Ave. Address Glendale AZ <b>85301</b>						
Phone <u>520 - 670 - 1311</u> 5. Owner of Well: <u>Same as above</u> Name	Filed <u>10-395</u> By <u>dt</u> Input By ENTERED OCT 1 7 1995 DUPLICATE	City State Zip       Q8       DWR License Number       Exploration						
Address City State Zip	Mailed <u>/e-//6-95</u> By <u></u> Registration 55- <u>552443</u> AMA/INA <u>194</u> W/S <u>85</u> S/B <u>06</u>	ROC License Category 12. Period well will remain in use:						
13. Proposed method of abandoment of		In accordance with DWR 2 R-12-15-816						

14. Is the propsed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility or storage area of hazardous materials or a petroleum storage area and tanks? Yes \_\_\_\_\_ No \_\_\_\_

## GENERAL INSTRUCTIONS

- 1. Fill out this form in <u>DUPLICATE</u> and send <u>WITH \$10.00 FEE</u> to 15 South 15th Avenue, Phoenix, AZ 85007.
- 2. For specific instructions, limitations and conditions, see the reverse side of this form.

I state that this Notice is filed in compliance with Rule A.A.C. R12-15-809 and R12-15-816(F), and is complete and correct to the best of my knowledge and belief and that I understand the conditions set forth on the reverse side of this form.

9-29-95 ; Date

Signature of Applicant/Owner agent for Kinnerott

DWD FE IN POINT AN

## CONDITIONS

- 1. Construction and abandonment standards for all wells shall be in accordance with A.A.C. Rules R12-15-811 and Rules R12-15-816.
- 2. Drilling of well(s) shall be completed within one (1) year after the date of Notice.
- 3. Mineral exploration, geotechnical, cathodic protection or grounding holes of 100 feet of depth or less do not apply to these provisions and do not require filing. However, if water is encountered during the drilling of these well(s), then the well(s) must be properly abandoned in accordance with Condition 1 above.
- 4. More than one well may be drilled under a single notice for mineral exploration and geotechnical wells so long as they are located within a single section.
- 5. A Project Completion Report and WELL ABANDONMENT COMPLETION REPORT must be filed for each mineral exploration hole within thirty (30) days of completion of drilling. A Well Driller Report for each hole drilled, must be filed by the driller within thirty (30) days of completion of drilling for geotechnical, cathodic protection and grounding.
- 6. The location of mineral exploration and geotechnical wells may be limited to the section, township and range. However, a complete legal description may be provided at the option of the well owner.
- 7. Pump equipment may not be installed on wells drilled for mineral exploration, geotechnical, cathodic proctection or grounding purposes.
- 8. Special construction standards required pursuant to R12-15-821:\_\_\_\_\_

<sup>9.</sup> To abandon a well in the course of drilling, the drilling contractor shall not remove the drilling rig from the well site, otherwise, a Notice of Intent to Abandon a Well must be filed prior to abandonment, and abandonment shall not commence until Department authority has been issued or, if during the course of drilling a well the Driller or owner elects to discontinue drilling and proceed with the abandonment of the well. The filing of a Well Abandonment Completion Report shall be filed within 30 days of abandonment, in accordance with R12-15-816.F.

GROUNDWATE 500 NORTH THI		17-2422	<u>CEIVE</u> APR - 8 1996
			CORDS MGT
A.R.S. \$45-594; R12-15-816: Within 30 days after Completion Report on a form prescribed and fur		well drilling contractor shall	file a Well Abandonment
1. Well Registration No. 55 552443			
2. Well Location: <u>2</u> NS <u>12</u> Township Range	2ÉW9 Section	<u>NW</u> 4 NU 10 Acre 40 Acr	<u> </u>
3. Owner of the Well: Name: KENNECOTT E			
1802 W. GRANT RD- STE II' Address	9 TUCSON	AZ	<u>85745</u> Zip
Address	City	State	Zip
4. Owner of the Land: Name:SAMEASA	BOVE		
Address	City	State	Ζίρ
5. Well Description: <u>3800</u> <u>3.032</u> Hole Depth Diameter	2274' OF 94MM (Out Type of Casing	er Casing) Diameter Type	(Inner Casing) of Casing
6. Reason for abandonment: Hole comp	leted	· ·	
<ol> <li>Prior to abandonment, did the well have 20' surface casing? Yes No_<u>×</u></li> </ol>	of steel surface casing A	ND 20' of grout in the annu	lar space surrounding the
8. If the answer to No. 6 is no, was the top 20'	of casing removed prio	to setting the cement plug?	Yes_K_No
9. Identify the materials and methods used to a	bandon the well; CEM	ENTED Hole from 380	0' 70 2150',
HEAVY THICK BENTONITE GOOM 2150'	TO 1000', CEMEN	T from 1000' TO 50	2FACE
10. Is this Abandonment Completion Report filed	d in accordance with R1.	2-15-816,F.? Yes_ <u></u> No_	
11. How deep does the cement plug extend belo	w land surface? 1000	<u>&gt;'</u>	
12. Was the well backfilled above the cement pl	ug? Yes No		
13. Date abandonment completed: 3-14-9	6		
14. Drilling Firm: Name: CHRISTENSEN Boy/	es CORP-	License N	10: ZB
6527 W. NORTH VIEW	Glendale	AZ	85301
Address DATE: <u>4-2-96</u> SIGNATURE	City	State State	Zip
CANCELL	LU	ENTERED APR	1 0 1995

ARIZONA DEPARTMENT OF W ATRR RECOTT APR - 8 1996 15 South 15th Avenue Phoenix, Arizona 85007 PROJECT COMPLETION REPORT FOR MINERAL EXPLO This report must be prepared by the owner in all detail for each hole drilled and filed with the Department within 30 days following completion of the well drilling project. 1. Owner Name: Kennecott Exploration Company Address: 1802 W. Grant Rol. Suite 119 These City Az. 85745 2. Lessee or Operator Name: Dme. Address: Street City State Zip 3. Driller Name: Christensen Boyles Corp. Address: 6527 W. Northview Ave. Gendale AZ Street State Zip 4. Location: 2 12 EN 9 NW 1/4 NW 1/4 NW 1/4 Township Range Section 10-Acre 40-Acre 160-Acre WELL REGISTRATION NO. 55- 552443 (REQUIRED) **DESCRIPTION OF WELL** 5. Type of Casing (if installed): 2274' of 94mm casing, abondoned 120' @ 2154-2274' 6. Abandonment method and material used if abandoned: Cemented hole from 3800 to 2150 benton tic mul from 2150 to 1000', Cerrent from 1000' to surface artesian flow was completely abated by coment column. Was well abandoned in the course of drilling pursuant to R12-15-816, F.? Yes\_V\_No\_\_\_\_ 7. Date of period drilled: From: 11-8-95 To: 3-1-96 LOG OF WELL **Unconsolidated Formation** DO NOT WRITE IN THIS SPACE Consolidated Formation X **OFFICE RECORD** Depth to water in fect below land surface: Artesian How (if encountered or detected) source at 2800' below Registration No. Surtace, Received \_\_\_\_\_ By I state that this report is filed in compliance with A.R.S. §45-600 and is complete and correct to the best of my Entered\_\_\_\_\_ By knowledge and belief. File No. esse#s Signature Date DWR-55-57-7/91(Rev)

# ARIZONA DEPARTMENT OF WATER RESOURCES

500 North Third Street, Phoenix, Arizona 85004 Telephone (602) 417-2470 Fax (602) 417-2422

October 13, 1995



FIFE SYMINGTON Governor

KENNECOTT EXPLORATION CO. 1802 W. GRANT RD. S119 TUCSON, AZ. 85745 RITA P. PEARSON Director

Re: Registration No. 55-552442 THRU 55-552444

File No. VARIOUS

Dear Well Owner:

Enclosed for your records is an annotated copy of the Notice of Intention to Drill a well which was recently filed with this Department. This is returned to you as evidence of compliance with A.R.S. §45-596. Your designated driller has been mailed, separately, a Well Drilling Card which he is required to have in his possession before commencing to drill the well.

This well is authorized to be drilled for mineral exploration purposes. Because of this, no pump equipment may be installed. A Project Completion report is being furnished you for each hole to be drilled. You are required to submit this within 30 days after completion of drilling. Frequently, exploration wells are abandoned shortly after drilling. Per R12-15-816.F a Well Abandonment Completion Report must be submitted by the driller. The Department of Water Resources requires you to obtain written permission before proceeding with the drilling, in the event, that you determine it necessary to change the location of the proposed well. A properly signed amended Drilling Card must be in the possession of the driller before drilling commences at a different location.

For your <u>future</u> use, a Change of Well information form is enclosed for your convenience. Per A.R.S. §45-593, the person to whom a well is registered shall notify this Department of a change of ownership of the well and/or information pertaining to the physical characteristics of the well, in order to keep the well registration file current and accurate.

Sincerely,

Water Resource Technician Groundwater Section

RECEIPT № 23440

· ... . ·

۰ ·.

JOEY WILKINS 450 E. SMOOT TUCSON, AZ. 85705

. . . .

STATE OF ARIZONA DEPARTMENT OF WATER RESOURCES 500 NORTH THIRD STREET PHOENIX, ARIZONA 85004 (602) 417-2405

ENTRY CODE 55

FILE NO. VARIOUS	552442	THRU	552444	
	ITEM DESCRIPTION		RATE	AMOUNT
NOI FEE			\$10.00	\$30.00
				· · · · · · · · · · · · · · · · · · ·
10	2210			
		#******		<u> </u>
	MANDEL			
10/13/95/ek	30.00 <sup>7</sup>			\$30.00
CHECK NO.	FEE ACCOUNT NO.		TOTAL \$	
CHIT NO	RECEIVED BY		DATE	

IPS 1821 - Rev. 4/91

ومحمد فكالمربو فسترار التنديني

# ARIZONA DEPARTMENT OF WATER RESOURCES GROUNDWATER MANAGEMENT SUPPORT SECTION 500 North Third Street Phoenix, Arizona 85004-3903

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILL OPERATIONS

WELL REGISTRATION NO: 55-552443

AUTHORIZED DRILLER: CHRISTENSEN BOYLES CORP.

LICENSE NO: 28

NOTICE OF INTENTION TO DRILL MINERAL EXPLORATION WELLS HAS BEEN FILED WITH THE DEPARTMENT BY:

CONSULTANT:

WELL OWNER: KENNECOTT EXPLORATION CO.

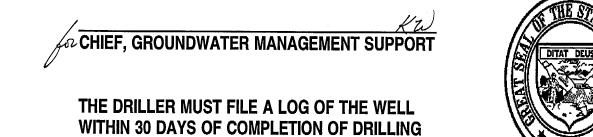
1

The well(s) is/are to be located in the:

NW 1/4 of the NW 1/4 of the NW 1/4 Section 9 Township 2S Range 12E

No. of wells in this project:

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE 2ND DAY OF OCTOBER, 1996.



	ARIZONA DEPARTMENT OF WAT	TER RESOURCES	Constitution and another the	• •
•	15 South 15th Avenu	1 8 6 6 K 110		
	Phoenix, Arizona 850	07 . ///// ar	and the second s	\$_/n]/
•	PROJECT COMPLETION REPORT FOR MINER	AL EXPLORATIO	ON DRAID	///// G. // //
	nis report must be prepared by the <u>owner</u> in all detail for each ho days following completion of the well drilling project.	le drilled-and filed	Abothe Depart	tment within
			and the second sec	
т.	Owner Name: Kennecott Exploration Company	_		
	Address: 1802 W. Grant Rol. Suite 119 Street	Tueson City	<u>AZ</u> State	<u>85745</u> Zip
2.	Lessee or Operator Name: <u>Same as above</u>	e		
	Address:	·		······································
	Street	City	State	Zip
3.	Driller Name: Christensen Boyles Corp.			
	Address: 6527 W. Northview AVE.	Stendale	Az	85301
	Street	City	State	Zip
4.	Location: <u>2 30 12 Em 9.</u> NW 1/4 NL	1/4 NW 1/4		
	Township Range Section 10-Acre 40-Acre	cre 160-Acre		
	WELL REGISTRATION NO. 55- <u>552443</u>	(REQUIRED	)	
	DESCRIPTION OF W	ELL		
5.	Type of Casing (if installed): <u>2274' of 94mm Casin</u>	a paralmed	120 @ 214	4-2274
0.	Type of Casing (in Instance). <u></u>	) genannen	<u>- 120 - 2213</u>	( AATT
6.	Abandonment method and material used if abandoned: <u>Cen</u>	nented hole to	om 3800 +	<u>o 2150'j</u>
	Heavy bentonitic much from 2150'to 1000	, Cement +	From 1000'	to surface.
	All artesian flow was completely as	bated by cer	ment Colum	··· .
	Was well abandoned in the course of drilling pursuant to R12-			
7	Date of period drilled: From: 11-8-95			<u> </u>
••	Date of period drifted. From			
	LOG OF WELL			
	Unconsolidated Formation			
		DO NOT WRI	TE IN THIS	SPACE
	Consolidated Formation	OFFI	CE RECORD	
	Depth to water in feet below land surface: <u>Artesian</u> How (if encountered or detected) source at 2800' below	Registration No.		
	Surface.	* * • • •		
I st	tate that this report is filed in compliance with A.R.S.	Received, TER	By <u>****</u> FD 400 ****	# 1000
§48	5-600 and is complete and correct to the best of my owledge and belief.	Entered	By	5 1996
KII	A A A A A A A A A A A A A A A A A A A	File No		
	Hanghlikking 4-2-96			
Ow	mer/Lesser's Signature Date			
DW	R-55-57-7/91(Rev)			

**\***•