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TECHNICAL MEMORANDUM

DATE: June 17, 2011 **Project 605.31**

TO: Greg Ghidotti
RESOLUTION COPPER MINING LLC

FROM: Charlie King, Janis Blainer-Fleming, Kate Duke, and Todd Keay
MONTGOMERY & ASSOCIATES

SUBJECT: RESULTS OF DRILLING, CONSTRUCTION, AND TESTING AT HYDROLOGIC TEST WELLS DHRES-03, DHRES-04, DHRES-05 AND DHRES-05B, RESOLUTION COPPER MINING, PINAL COUNTY, ARIZONA

In accordance with a request from Mr. Greg Ghidotti, Resolution Copper Mining LLC (RCM), Montgomery & Associates (M&A) has prepared this Technical Memorandum to summarize results of drilling, construction, equipping, and testing at hydrologic test wells DHRES-03, DHRES-04, and DHRES-05/DHRES-05B. The wells were installed to characterize hydrogeologic conditions in the Gila Conglomerate and Apache Leaf Tuff west of the Concentrator Fault in the vicinity of West Plant site and to provide monitoring locations for the aquifer west of the Concentrator Fault during dewatering operations in 2010 and 2011. Groundwater level data obtained from DHRES-03, DHRES-04, and DHRES-05/DHRES-05B has been incorporated into the RCM hydrologic monitoring program.

DHRES-03 SUMMARY

A summary of drilling, construction, and testing operations and results is provided below:

1. Hydrologic test well DHRES-03 is located on land owned by RCM, in Township 1 South, Range 12 East, in the SE ¼ of the SW ¼ of the NW ¼ of Section 35 ((D-1-12) 35bcd) at West Plant site adjacent to well DHRES-04.
2. Well DHRES-03 was drilled and constructed during the period February 6 through 16, 2009.
3. Total drilled depth is 598.0 meters below land surface (bls).

4. Geologic units encountered during drilling from land surface to total depth include Quaternary-Tertiary Gila Conglomerate (QTg) and Tertiary volcanic rocks (Tvs).
5. Completion at DHRES-03 consists of a fully grouted piezometer array of four vibrating-wire pressure transducers. A water sample was collected for screening water quality during drilling.

DHRES-04 SUMMARY

A summary of drilling, construction, and testing operations and results is provided below:

1. Hydrologic test well DHRES-04 is located on land owned by RCM, in Township 1 South, Range 12 East, in the SE ¼ of the SW ¼ of the NW ¼ of Section 35 ((D-1-12) 35bcd) at West Plant site adjacent to well DHRES-03.
2. Well DHRES-04 was drilled and constructed during the period February 17 through 27, 2010.
3. Total drilled depth is 713.2 meters bls.
4. Geologic units encountered during drilling from land surface to total depth include QTg and Tvs.
5. The well is completed in the QTg and Tvs with one perforated interval from 539.5 to 706.7 meters bls.
6. Non-pumping water level is approximately 123 meters bls.
7. Following installation of production casing, a 4-hour airlift pumping test was conducted to develop the well and provide preliminary hydraulic parameters for the Tvs.
8. The well was equipped with dedicated pump and water level recording equipment on October 2, 2009.
9. A 12-hour constant-rate pumping test was conducted on December 21, 2009. Results of the test indicate a transmissivity of 2 meters squared per day (m^2/d) and an average hydraulic conductivity of 6×10^{-6} centimeters per second (cm/s).
10. A water sample was collected for laboratory chemical and isotopic analyses near the end of the airlift and constant-rate pumping tests.

DHRES-05 SUMMARY

A summary of drilling, construction, and testing operations and results is provided below:

1. Hydrologic test well DHRES-05 is located on land owned by the RCM, in Township 1 South, Range 12 East, in the SW ¼ of the NW ¼ of the SE ¼ of Section 34 ((D-1-12) 34dbc) at West Plant site.

2. Well DHRES-05 was first drilled and constructed during the period March 1 through 11, 2009; the well was deepened during the period from August 11 through 26, 2010 (see DHRES-05B summary below).

3. DHRES-05 was drilled to a total depth of 920.7 meters bls in March 2009.
4. Geologic units encountered during drilling from land surface to total depth include QTg, Tvs, and Tertiary Apache Leap Tuff (Tal).
5. DHRES-05 was completed in the Tvs and QTg with two perforated intervals from 496.3 to 721.4 and 862.8 to 888.5 meters bls.
6. Non-pumping water level was approximately 13 meters bls. A slug test was conducted from July 28 to August 17, 2009. Results of the slug test indicate a specific storage of 5×10^{-3} m^{-1} and an average hydraulic conductivity of 7×10^{-9} cm/s in the QTg.

DHRES-05B SUMMARY

1. Hydrologic test well DHRES-05B (the deepened version of DHRES-05) is located on land owned by the RCM, in Township 1 South, Range 12 East, in the SW ¼ of the NW ¼ of the SE ¼ of Section 34 ((D-1-12)34dbc) at West Plant site.
2. Well DHRES-05B was drilled and constructed during the period from August 11 through 26, 2010.
3. Well DHRES-05B was drilled to a final depth of 1,224.7 meters bls.
4. Well DHRES-05B is completed in the Tal with one perforated interval from 955.6 to 1,219.8 meters bls. Non-pumping water level is approximately 46 meters bls.
5. Following installation of final production casing airlift testing was attempted; however, airlifting could not be sustained which indicates that transmissivity of the Tal at this location is very small.

INTRODUCTION

Hydrologic test wells DHRES-03, DHRES-04 and DHRES-05 were drilled and constructed during the period February 6 through March 12, 2009. DHRES-05 was deepened during the period August 11 through 26, 2010 and renamed DHRES-05B. The wells were drilled to:

- evaluate groundwater conditions in the Quaternary-Tertiary Gila Conglomerate (QTg), Tertiary volcanic rocks (Tvs), and Tertiary Apache Leap Tuff (Tal) west of the Concentrator Fault
- characterize lithology west of the Concentrator Fault
- provide groundwater level and groundwater quality monitoring points in the deep groundwater system west of the Concentrator Fault during dewatering of existing mine workings.

Wells DHRES-03, DHRES-04, and DHRES-05/DHRES-05B are located on land owned by RCM at West Plant site. Wells DHRES-03 and DHRES-04 are located in Township 1 South, Range 12 East, in the SE ¼ of the SW ¼ of the NW ¼ of Section 35 ((D-1-12)35bcd). **Photographs 1 and 2** show the layout for the DHRES-03 and DHRES-04 well sites during

drilling operations. Well DHRES-05/DHRES-05B is located in Township 1 South, Range 12 East, in the SW ¼ of the NW ¼ of the SE ¼ of Section 34 ((D-1-12)34dbc). **Photograph 3** shows the layout for DHRES-05B during drilling operations. **Figure 1** shows the locations for DHRES-03, DHRES-04, and DHRES-05/DHRES-05B. **Figures 2 and 3** are schematic diagrams of well construction for DHRES-03 and DHRES-04, and **Figures 4 and 5** are schematic diagrams of well construction for DHRES-05 as completed in 2009, and DHRES-05B following modification in 2010, respectively. Other data summarized on the schematic diagrams include: hydrogeologic units, fracture summary log, drilling penetration rate, water production rate during drilling operations, and borehole geophysical logs. Detailed lithologic logs for the test wells are provided in **Appendix A**.

Photograph 1. Site layout at DHRES-03 during drilling operations

Photograph 2. Site layout at DHRES-04 during drilling operations

Photograph 3. Site layout at DHRES-05B during drilling operations in 2010.

DRILLING OPERATIONS

Hydrologic test wells DHRES-03, DHRES-04, and DHRES-05 were drilled and constructed by Boart Longyear Drilling Services (Boart Longyear) of Salt Lake City, Utah, using a Lang LM-140 (LK-38A) top-head drive rotary drill rig. Another Lang LM-140 rig (LK-35A) was used to deepen DHRES-05 and to construct DHRES-05B. The wells were drilled and completed in accordance with technical specifications prepared by M&A. Mr. Jeff Hacking and Mr. Bryon Werner of Boart Longyear supervised drilling, construction, and airlift testing activities at the drill sites. RCM personnel coordinated drilling contractor activities and purchase of well construction materials. Daily drilling reports were prepared by Boart Longyear personnel and were submitted to RCM for review. M&A personnel described drill cuttings samples and provided on-site monitoring during critical phases of drilling and construction of the wells. RCM provided daily summaries of drilling progress. Daily summary data are provided in **Appendix B**.

Well DHRES-03 was drilled to 598.0 meters bls and completed as a fully grouted vibrating-wire piezometer array. Wells DHRES-04 and DHRES-05 were drilled and constructed in two stages. During the first stage, the boreholes were drilled to 462.7 and 347.0 meters bls, respectively, and then intermediate casing was installed and cemented in place. During the second stage, the boreholes were drilled to total depth of 713.2 and 920.7 meters bls, respectively, and blank and perforated casing were installed to the designed depth. Well DHRES-05 was deepened to 1,224.7 meters bls in August 2010 and designated well DHRES-05B. Mr. Pat Perez of Boart Longyear supervised the drilling, construction, and airlift testing activities in August 2010. Final completions of all wells were designed by M&A based on review of lithologic and hydrologic conditions encountered during drilling operations and results of borehole geophysical logs.

Drilling Method

The boreholes for DHRES-03, DHRES-04, and DHRES-05/DHRES-05B were drilled using conventional air rotary drilling method for the surface borehole, conventional mud rotary method for the intermediate borehole, and dual-wall air reverse circulation and air-assisted flooded reverse circulation methods for the production interval of the borehole. Depths, drilling methods, and bit types and sizes are summarized in **Table 1**.

TABLE 1. SUMMARY OF DRILLING METHODS AND BOREHOLE DIAMETERS FOR HYDROLOGIC TEST WELLS DHRES-03, DHRES-04, DHRES-05, AND DHRES-05B				
WELL	**DEPTH INTERVAL (meters bls)**	**DRILLING METHOD**	**BIT TYPE**	**BOREHOLE DIAMETER (inches)**
DHRES-03	0 – 12.2	conventional air rotary	tricone	12-¼
	12.2 – 251.5	reverse circulation air percussion	hammer	6-¾
	251.5 – 598.0	reverse circulation air percussion	hammer	6-½
DHRES-04	0 – 12.2	conventional air rotary	tricone	19
	12.2 – 462.7	conventional mud rotary	tricone	12-¼
	462.7 – 713.2	reverse circulation air rotary	tricone	6-½
DHRES-05	0 – 6.1	conventional air rotary	tricone	17
	6.1 – 347.0	conventional mud rotary	tricone	12-¼
	347.0 – 713.8	reverse circulation air percussion	hammer	6-¾
	713.8 – 920.7	reverse circulation air rotary	tricone	6-½
DHRES-05B	920.7 – 1,224.7	air-assisted flooded reverse circulation	tricone	6-½

Drilling Fluid and Drill Cuttings Management

Air, water, and polymer/bentonite-based drilling fluids were used during drilling operations. When air methods were used, the drilling fluids were discharged to a cyclone to separate air from the fluid stream. The remaining drilling fluid and cuttings then flowed through a vibrating screen to remove coarse cuttings. All drilling fluids and formation fluids produced during drilling and airlift testing were contained in portable tanks, removed from the site using vacuum trucks, and then deposited at a designated storage facility at the RCM West Plant site. Drill cuttings were collected in the bucket of a back-hoe, stored on site, and then spread on site after well construction was complete.

Monitoring of Drilling Conditions

During drilling operations, drill penetration rate was monitored by Boart Longyear by recording drill start and stop times for each 6.1-meter long drill rod. A summary of drill penetration rate data is shown on **Figures 2 through 5.** In addition to drill penetration rate, rotational torque was monitored by drilling personnel, and zones of variable or increasing torque were noted as a potential indicator of fracturing. The field data recorded by Boart Longyear are on file at M&A. Borehole deviation surveys were also conducted on a regular basis using a Totco mechanical drift recorder. At DHRES-03, borehole deviation increased steadily to 2.5 degrees from land surface to total depth. At DHRES-04, borehole deviation increased steadily to 2 degrees from land surface to total depth. At DHRES-05 borehole deviation was

1 degree or less from land surface to the original total depth, with the exception of 2 degree deviation at 457 meters bls. Borehole deviation increased to between 6 and 7 degrees during the drilling of the modified portion of the borehole at DHRES-05B from 920.7 to 1,224.7 meters bls.

Monitoring of Lithologic Conditions

Drill cuttings samples were collected at 10-foot intervals and placed in labeled bags. Lithologic descriptions for each sample were prepared in the field by M&A personnel. Splits of each sample were placed in plastic chip trays and were provided to RCM. Bulk cuttings samples have been palletized and are stored at the core storage facility at the East Plant site. Detailed lithologic descriptions are given in **Appendix A**.

Monitoring of Groundwater Conditions

When the dual-wall air reverse circulation drilling method was used, it was possible to monitor for the presence of groundwater, and to determine approximately where groundwater inflow zones were encountered. Water production could not be monitored during conventional mud rotary drilling at DHRES-04. However, DHRES-03 is adjacent to DHRES-04 and provides water production data for the relevant interval. Water production also could not be monitored during air-assisted flooded reverse circulation drilling during the DHRES-05 modification. While drilling using the dual-wall air reverse circulation drilling method, observations of natural groundwater production were made after drilling out each 6.1-meter drill rod. Prior to measurement of production rate, injection water was cut off from the airstream, and air circulation was continued for 10 to 15 minutes. When discharge stabilized, discharge rate was measured using a 2-gallon bucket and stop watch, and results were recorded on the drillers' field log.

At DHRES-03 the depth interval from 12.2 meters bls to total depth was drilled using the dual-wall air reverse circulation method and groundwater production was measured. Results of flow measurements made during drilling operations for well DHRES-03 are summarized on **Figure 2**. First measurable water production rate at DHRES-03 was 0.6 L/s at a depth of 134.7 meters bls. Measured groundwater production rate was 5.1 L/s for the interval from 140.8 through 177.4 meters bls. Maximum measured groundwater production rate was 6.4 L/s at 183.5 meters bls. Measured groundwater production rate ranged from 0.5 to 5.1 L/s for the interval from 195.7 meters bls to total depth. Discharge water for the wells was monitored for changes in water quality parameters (temperature, pH, specific conductance, and sand content). **Table 2** is a summary of water quality parameters measured during drilling operations. Four vibrating-wire piezometers were grouted in at DHRES-03 and provide hydraulic head information at discrete elevations within the well. Piezometer installation details and selected hydraulic head data are presented in the **Well Construction** and **Hydraulic Head Data** sections below.

At DHRES-04, the depth interval from 462.7 meters bls to total depth was drilled using the dual-wall air reverse circulation method and groundwater production was measured. Results of flow measurements made during drilling operations for well DHRES-04 are summarized on **Figure 3**. First measurable water production rate at DHRES-04 was 0.2 L/s at a depth of 536.4 meters bls. Maximum measured groundwater production rate was 5.4 L/s at 688.8 and 694.9 meters bls.

At DHRES-05, the depth interval from 347.0 to 920.7 meters bls was drilled using the dual-wall air reverse circulation method and groundwater production was measured. Results of flow measurements made during drilling operations for well DHRES-05 are summarized on **Figures 4 and 5**. First measurable water production rate at DHRES-05 was 0.7 L/s at a depth of 305.4 meters bls. Maximum measured groundwater production rate was 1.0 L/s at 339.2 meters bls.

TABLE 2. FIELD PARAMETERS OBTAINED DURING AIR DRILLING OPERATIONS AT DHRES-03, DHRES-04, AND DHRES-05				
WELL	**DEPTH (meters bls)**	**TEMPERATURE (degrees Celsius)**	**pH (standard units)**	**SPECIFIC CONDUCTANCE (microSiemens per centimeter)**
DHRES-03	251.5	17.1	8.48	541.0
	274.9	19.2	8.44	540.6
	305.4	19.4	8.47	543.5
	335.9	20.4	8.75	544.5
	365.8	19.3	8.70	519.7
	396.2	19.0	8.47	548.4
	426.7	14.2	8.97	560.4
	475.5	18.0	8.43	536.2
	487.7	15.5	8.57	517.1
	518.2	18.1	8.46	503.8
	542.5	11.1	8.77	566.6
	573.0	9.2	8.48	472.6
	579.7	31.2	8.41	388.0
	598.0	35.2	8.53	382.1
DHRES-04	560.8	23.8	7.78	---
	591.3	36.2	8.62	417.6
	621.8	33.3	8.64	420.5
	646.2	30.1	8.23	458.9
	676.7	30.3	8.64	460.9
	701.0	33.1	8.72	455.3
	713.2	34.2	8.68	442.9
DHRES-05	506.6	21.4	8.62	368.9
	537.1	16.2	7.26	455.5
	567.5	13.3	7.68	548.2
	598.0	15.6	9.02	543.8
	628.5	19.3	8.73	514.3
	659.0	20.6	8.66	753.7
	689.5	17.3	8.78	831.0
	746.8	18.4	8.59	570.9
	779.7	18.6	8.72	582.8
	847.3	22.3	8.64	520.2
	865.6	24.8	8.73	574.5

BOREHOLE GEOPHYSICAL LOGGING

Borehole geophysical logging was conducted when the boreholes for DHRES-03 and DHRES-04 reached total depth. Borehole geophysical logs were not obtained in the conductor portion at well DHRES-04 because logs were obtained at adjacent well DHRES-03 in a smaller diameter borehole. Borehole geophysical logging was conducted in four stages at hydrologic test well DHRES-05. The first stage of logging was conducted following drilling of the intermediate borehole to a depth of 347.0 meters bls, and the second stage of logging was conducted after drilling of the production borehole to the original total depth of 920.7 meters bls. At the time logging was conducted following drilling in 2009, depth to water level was about 700 meters bls and logs were obtained for the interval from 700 meters bls to total depth. The third stage of logging was conducted following the removal of the temporary production casing in August 2010, and data were obtained for the interval from 347.0 to 700 meters bls. The fourth stage of logging was conducted for the deepened portion of the production borehole for the interval from 920.7 to 1,224.7 meters bls.

Borehole geophysical logging services were generally provided by Southwest Exploration Services, LLC (SWE) of Gilbert, Arizona; however, Schlumberger of Farmington, New Mexico, conducted deviation and formation micro-resistivity image (FMI) logging of the deepened portion of DHRES-05B. Borehole geophysical logging was conducted at DHRES-03 on February 13, 2009, and at DHRES-04 on February 26, 2009. The first and second stages of geophysical logging at DHRES-05 occurred on March 4 and 10, 2009. The third and fourth stages of geophysical logging at DHRES-05B were conducted on August 11 and 21, 2010 by SWE. Schlumberger conducted logging of the deepened part of DHRES-05B on August 25, 2010. The suite of geophysical logs obtained included: electrical resistivity (E-log), spontaneous potential (SP), natural gamma ray, sonic, temperature, fluid resistivity, 3-arm caliper, and acoustic borehole imaging (ABI). At DHRES-05, FMI and deviation logs were also obtained. SWE and Schlumberger submitted field logs in digital and hard copy format to RCM. A well video of the original well construction at DHRES-05 was conducted by SWE on July 29, 2010. Summary geophysical logs for DHRES-03, DHRES-04, DHRES-05 and DHRES-05B are provided on **Figures 2 through 5**.

ANALYSIS OF GEOLOGIC CONDITIONS

Geologic Contacts

Geologic contacts were picked based on analysis of drill cuttings samples, geophysical logs, and information obtained during drilling and airlift testing. **Table 3** is a summary of geologic contacts at DHRES-03, DHRES-04, and DHRES-05. Detailed lithologic descriptions based on drill cuttings samples are provided in **Appendix A**. Geophysical logs provided by Schlumberger and SWE were used to pick the formation depth intervals.

TABLE 3. SUMMARY OF GEOLOGIC UNITS DRILLED FOR WELLS DHRES-03, DHRES-04 DHRES-05, AND DHRES-05B		
WELL	**GEOLOGIC FORMATION**	**DEPTH INTERVAL (meters)**
DHRES-03	Gila Conglomerate (QTg)	0 – 541.0
	Tertiary Volcanics – Tuff and Sandstone (Tvs)	541.0 – 562.4
	Tertiary Volcanics – Basalt and Paleosol (Tvs)	562.4 – 598.0
DHRES-04	Gila Conglomerate (QTg)	0 – 544.7
	Tertiary Volcanics – Tuff and Sandstone (Tvs)	544.7 – 571.2
	Tertiary Volcanics – Basalt and Paleosol (Tvs)	571.2 – 713.2
DHRES-05/5B	Gila Conglomerate (QTg)	0 – 335.3 456.2 – 501.0 515.0 – 942.8
	Tertiary Volcanics – Basalt and Paleosol (Tvs)	335.3 – 456.2
	Tertiary Volcanics – Rhyolitic Tuff (Tvs)	501.0 – 515.0
	Apache Leap – Tuff White Unit (Talw)	942.8 – 1,079.9
	Apache Leap – Tuff Gray Unit (Talg)	1,079.9 – 1,205.7
	Apache Leap Tuff – Brown Unit (Talb)	1,205.7 – 1,224.7

Fracture summary logs were prepared using geophysical logs including FMI, ABI, sonic, and electrical resistivity. Where available, the FMI or ABI logs were the primary sources for the fracture summary logs. If FMI or ABI logs were not available or were poor quality, sonic logs were used to classify fractures. Electrical resistivity logs were used to confirm fracture zones. Fractures were qualitatively classified as minor, moderate, or major based on inspection of the logs. Minor fractures include joints and flow layer margins with no mineral filling generally less than 1 inch across. Moderate fractures include joints and faults with mineral filling or open voids ranging from about 1 to 6 inches across. Major fractures include faults or fault zones with mineral filling or open voids larger than about 6 inches across. Where FMI or ABI logs were not available, fractures zones were assigned using the sonic log to zones where acoustic travel time was larger than background. Intensity of the fracture was assigned based upon thickness of the anomalous zone. Major fractures were assigned to wide zones of slower acoustic travel. Fracture summary logs are shown on **Figures 2 through 5**.

Gila Conglomerate (QTg)

At DHRES-03 and DHRES-04 the QTg is 541.0 and 544.7 meters thick, respectively. It is matrix-supported conglomerate with a matrix of silty sandstone. The gravel fraction is Tal-rich but also contains quartzite, limestone, basalt, diabase, banded tuff, and chert. The QTg is weakly lithified at DHRES-03 and DHRES-04 to a depth of 368.8 and 240.8 meters bls, respectively, and moderately lithified below these depths (**Figures 2 and 3**).

At DHRES-05 the QTg contains intercalated flows of Tvs, with an overall thickness of 942.8 meters. The QTg occurs in the depth intervals land surface to 335.3 meters, 456.2 to 501.0 meters, and 515.0 to 942.8 meters bls. At DHRES-05 the QTg is a moderately lithified, matrix-supported conglomerate with a matrix of silty sandstone. In the first two depth intervals the gravel fraction consists of mixed lithologies of quartzite, schist, diabase, banded tuff, felsic tuff, basalt, and Tal. The deepest interval of QTg consists of the same assemblage but is schist-rich from 515.0 to 585.2 meters bls, diabase-rich from 585.2 to 816.9 meters, pink dolomitic limestone and diabase-rich from 816.9 to 819.9 meters, and limestone-rich from 819.9 to 942.8 meters bls (**Figures 4 and 5**).

Tertiary Volcanics (Tvs)

The Tvs at DHRES-03 and DHRES-04 is greater than 168.5 meters thick. At DHRES-04 the Tvs consists of felsic yellow tuff from 544.7 to 563.9 meters bls, red sandstone and scoria from 563.9 to 571.2 meters bls, basalt from 571.2 to 598.8 meters bls, paleosol and scoria from 589.8 to 603.2 meters bls, basalt from 603.2 to 642.5 meters bls, alternating basalt, scoria, and paleosol from 642.5 to 691.6 meters bls, and basalt from 691.6 to 713.2 meters bls. At DHRES-03 the Tvs consists of tuff from 541.0 to 557.8 meters bls, sandstone and scoria from 557.8 to 562.4 meters bls, basalt from 562.4 to 593.7 meters bls, and paleosol from 593.7 to 598.0 meters bls (**Figures 2 and 3**).

At DHRES-05 two intervals of Tvs were encountered from 335.3 to 456.2 and 501.0 to 515.0 meters bls. The first interval of Tvs consists of basalt from 335.3 to 369.4 meters bls, paleosol and basalt from 369.4 to 377.4 meters bls, and basalt from 377.4 to 456.2 meters bls. The second interval of Tvs consists of rhyolitic tuff (**Figures 4 and 5**).

Apache Leap Tuff (Tal)

The Tal was penetrated at DHRES-05B and it is greater than 281.9 meters thick. It consists of White Unit (Talw) weakly welded tuff from 942.8 to 1,079.9 meters bls, Gray Unit (Talg) moderately welded tuff from 1,079.9 to 1,205.7 meters bls, and Brown Unit (Talb) densely welded tuff from 1,205.7 to 1,224.7 meters bls. The Talw, Talg, and Talb are crystal-rich dacite porphyry tuff with phenocrysts of potassium and plagioclase feldspars, quartz, biotite, and minor hornblende in an aphanitic to glassy groundmass, with trace pumice and trace lithic fragments.

WELL CONSTRUCTION

At test well DHRES-03, 3-inch blank, flush threaded steel casing was installed to 590.8 meters bls. The bottom 6 meters was perforated with six 1-inch diameter torch-cut holes to allow the grout to pass into the annular space between the pipe and the borehole wall. Two centralizers were installed at the bottom of the casing string. Four vibrating-wire pressure transducers manufactured by Geokon of Lebanon, New Hampshire, were attached to the outside

of the casing string to measure pore pressures in the QTg and Tvs. **Photograph 4** shows a transducer installation on the 3-inch casing at DHRES-03. Details regarding the piezometers installed at DHRES-03 are given in **Table 4** and installed depths are shown on **Figure 2**. After the intermediate casing string and instrumentation were installed in the borehole, pressure grout was installed in the annular space by Halliburton of Farmington, New Mexico. The pressure grout mix consisted of the following ratio by weight: 2.5 parts water: 1 part cement: 0.3 parts bentonite. Details for the pressure grouting operation are provided in a separate summary report to RCM (Halliburton, 2009).

TABLE 4. DETAILS FOR GROUTED PRESSURE TRANSDUCER INSTALLATION FOR HYDROLOGIC TEST WELL DHRES-03

	MODEL NUMBER	IDENTIFIER*	SERIAL NUMBER	INSTALLED DEPTH (meters below land surface)	HYDROGEOLOGIC UNIT	PRESSURE RATING (Mega-Pascals)
1	Geokon 4500S	DHRES-03_782	08-21216	138.2	QTg	3
2	Geokon 4500SH	DHRES-03_729	08-11520	191.5	QTg	5
3	Geokon 4500SH	DHRES-03_539	08-11525	380.8	QTg	5
4	Geokon 4500SH	DHRES-03_335	08-25579	585.1	Tvs	7.5

* Identifier consists of well name and piezometer elevation in meters above mean sea level

Hydrologic test wells DHRES-04 and DHRES-05 were each constructed in two parts. An intermediate casing was installed from land surface to a depth of 458.6 and 347.0 meters bls, respectively. The intermediate casing consisted of 7-5/8-inch outside diameter blank, threaded and coupled steel casing. The casing was cemented in place by Boart Longyear. Drilling of the lower borehole commenced following a 72-hour cure period.

The production string for DHRES-04 and the original production string for DHRES-05 were constructed using 4-1/2-inch outside diameter blank and slotted, flush threaded steel casing. Perforations are 0.125-inch wide by 4-inch long machine-cut slots, two slots per round, four rounds per foot. The production casing was set on the bottom of the borehole using a back-off sub. At DHRES-04, a single perforated interval was installed in the depth interval from 539.5 to 706.7 meters bls. Well DHRES-05 was originally completed with two perforated intervals from 496.3 to 721.4 and 862.8 to 888.5 meters bls. One 20-foot joint of blank steel casing was installed below the slotted casing at DHRES-04, and five 20-foot joints of blank steel casing were installed below the slotted casing at DHRES-05; the bottom joint of casing was torch cut, tapered, and welded closed. Construction details for well DHRES-04 are shown on **Figure 3**, and for well DHRES-05 following construction in 2009 on **Figure 4**.

Before deepening of DHRES-05, a well video was obtained by SWE to determine the condition of the casing and feasibility of removing it. The casing was determined to be in good condition and was removed before drilling commenced. Following deepening of DHRES-05 in August 2010, the well was completed with a single perforated interval from 955.6 to

1,219.8 meters bls using 4-1/2-inch blank and slotted, threaded and coupled steel casing. The modified well is designated DHRES-05B. Perforations are 0.125-inch wide by 2.5-inch long machine-cut slots, two slots per round, four rounds per foot (8 slots per foot). One 20-foot joint of blank steel casing was installed below the slotted casing; the lowermost joint was capped with a bullnose end cap. The production casing was installed using a mechanical casing hanger manufactured by TIW Corporation of Houston, Texas. The casing hanger is installed between the 7-5/8-inch intermediate casing and the 4-1/2-inch production casing at a depth of 337.8 meters bls (depth confirmed in a video log conducted on February 28, 2011). Two swellable packers (TAMCAP Freecap II) manufactured by TAM International, Incorporated of Houston, Texas, were installed in the annular space between the production casing and the borehole wall at 941.5 and 943.7 meters bls to isolate the perforations in the Tal from overlying units. Two cement baskets were installed to protect the packers from any potential sloughing of the borehole wall. Casing centralizers were installed approximately every 30 meters and adjacent to the packers. During installation of the production string, while the mechanical hanger was being engaged, the casing was dropped and an estimated five feet at the bottom of the production casing was crushed. **Photograph 5** shows the installation of the swellable packers on production casing at DHRES-05B. A schematic diagram of final construction of well DHRES-05B is shown on **Figure 5**.

Photograph 4. Transducer strapped within protective fins on 3-inch casing at DHRES-03

Photograph 5. Swellable packers being installed on 4-1/2-inch casing at DHRES-05B

The surface completion at DHRES-03 consists of a cement column flush with the height of the 3-inch steel casing. Surface completions at DHRES-04 and DHRES-05/DHRES-05B consist of an extension of the 14-inch steel surface casing to approximately 1 meter above land surface. The casing extension is cemented in place and secured with a locking cap.

Groundwater level/pore pressure data from wells DHRES-03 and DHRES-04 are monitored remotely via a telemetry system. The telemetry system consists of a CR-850 datalogger manufactured by Campbell Scientific of Logan, Utah, that allows remote connection through a cell modem. Transducer cables run from wells DHRES-03 and DHRES-04 to the telemetry installation in underground conduit. **Photograph 6** shows the DHRES-03/DHRES-04 telemetry installation. Water level data from well DHRES-05/DHRES-05B are monitored remotely via a telemetry system similar to the system at DHRES-03 and DHRES-04. Data are available on the M&A Hydrogeometrics website at https://hydrogeometrics.com/vdv/Index.php).

Photograph 6. Telemetry system at DHRES-03/DHRES-04.

Horizontal and vertical well coordinates were surveyed by Civiltec Engineering, Inc. of Phoenix, Arizona, on April 9, 2009. At DHRES-03 the top of the 3-inch casing and cement were surveyed, and at DHRES-04 and DHRES-05/DHRES-05B, top of surface casing and top of the well cap were surveyed. Survey data and computed land surface and measurement point elevations are provided in **Table 5**.

TABLE 5. SUMMARY OF SURVEY RESULTS FOR HYDROLOGIC TEST WELLS DHRES-03, DHRES-04, AND DHRES-05/DHRES-05B			
	DHRES-03 (meters)	**DHRES-04 (meters)**	**DHRES-05/DHRES-05B (meters)**
Easting	490073.076	490094.914	488957.196
Northing	3684348.674	3684343.911	3683951.417
Elevation Top of 3-inch Casing and Cement	921.164	NA	NA
Elevation Top of 14-inch Surface Casing	NA	921.162	847.098
Elevation Top of Well Cap	NA	921.181	847.116
Elevation Land Surface	920.01	920.33	846.20

Datum: UTM Zone 12 North (NAD27)-NGVD29; NA = not applicable

HYDRAULIC HEAD DATA

Pore pressures measured at the DHRES-03 grouted-piezometer array have been converted to total hydraulic head in meters above mean sea level and are presented on the hydrograph in **Figure 6**. Pore pressures at all the grouted piezometers appear to have equilibrated with pore pressures in the adjacent formation within a few months following installation. Hydraulic head data from February 25, 2011 are shown on **Figure 2**. Further discussion of pore pressure data obtained at DHRES-03 will be provided in a future report.

PUMP INSTALLATION AND INSTRUMENTATION

Well DHRES-04 was equipped with a stainless steel Grundfos Model 25S50-26 pump with a 5-horsepower, 460-volt, 3-phase electric motor on October 2, 2009. The pump assembly was specified by M&A and installed by Layne Christensen Company, Water Supply/Environmental Division (Layne), of Chandler, Arizona. The pump is installed on 1-¼-inch galvanized steel column pipe with galvanized steel couplings at a depth of 182.9 meters bls. A 1-inch PVC sounder access tube extends from the wellhead to the top of the pump. The sounder access tube is capped on the bottom and factory slotted in the lowermost 3 meters. The pump, motor, and column pipe are suspended from a steel and rubber sanitary well seal installed at the wellhead.

Wells DHRES-04 and DHRES-05/DHRES-05B are equipped with Geokon pressure transducers and Campbell Scientific dataloggers. At DHRES-04, a 1MPa (145 psi) transducer

(SN 05-142) and LC-2x4 logger were installed on March 13, 2009. Groundwater level monitoring at DHRES-05 was conducted using temporary equipment from March 2009 to February 2010 until a 700KPa (100 psi) transducer (SN 09-16965) and CR-850 logger were installed on February 9, 2010. The transducer at DHRES-05 was removed prior to deepening of the well in August 2010, and then reinstalled in DHRES-05B in September 2010.

HYDRAULIC TESTING

Airlift testing was conducted at DHRES-04 and DHRES-05 to develop the wells and provide preliminary aquifer parameters. An airlift test was not conducted at DHRES-03 because it was completed as a fully-grouted piezometer array. After pump installation at DHRES-04 a constant-rate pumping test was conducted to further develop the well and to investigate hydraulic parameters and water quality. A slug test was conducted at DHRES-05 after the initial well construction. After the modification and final well construction at DHRES-05B airlift testing was attempted; however, the well did not produce enough water to sustain airlifting and the test was discontinued.

Discharge rate and water quality parameters were measured and recorded during testing at DHRES-04 and DHRES-05 using a Myron L parameter meter that was calibrated prior to each test. Duration of each test was based on the ability of the borehole to produce water and stabilization of water quality parameters. Discharge volumes and discharge rates were calculated by periodic measurement of storage tank levels during airlift testing. During the constant-rate pumping test discharge was measured using an in-line digital flowmeter. The test intervals, approximate borehole volumes, and approximate total discharge volumes for each test are summarized in **Table 6**. Water quality parameters measured during testing at DHRES-04 are summarized in **Table 7**. Operational details and results of the tests at wells DHRES-04 and DHRES-05/DHRES-05B are given in **Tables 8 and 9**, respectively.

Due to the discharge head configuration, groundwater levels could not be measured during airlift pumping; however, groundwater level measurements were obtained prior to each test and during the recovery period. Groundwater levels were recorded during both the drawdown and recovery phases of the constant-rate pumping test. Drawdown and recovery data were analyzed using straight-line methods (Cooper-Jacob Drawdown Method (1946) and Theis Recovery Method (1935)) implemented in the computer-based analytical aquifer test software AQTESOLV® for Windows, version 4.50.002 (Glenn M. Duffield, HydroSOLVE, Inc., 2008).

TABLE 6. SUMMARY OF BOREHOLE AND TOTAL DISCHARGE VOLUMES FOR HYDROLOGIC TEST WELLS DHRES-04, DHRES-05, AND DHRES-05B			
WELL	**TEST TYPE AND DATE**	**BOREHOLE VOLUME (liters)**	**APPROXIMATE TOTAL DISCHARGE VOLUME (liters)**
DHRES-04	Cased well airlift test 27 Feb 2009	12,000	37,200
DHRES-04	Constant-rate 21 Dec 2009	15,300	16,350
DHRES-05	Slug test 28 Jul 2009 – 17 Aug 2009	---	---
DHRES-05B	Cased well airlift test 27 Aug 2010	28,500	5,400

TABLE 7. SUMMARY OF WATER QUALITY PARAMETERS MEASURED DURING TESTS AT HYDROLOGIC TEST WELLS DHRES-04					
WELL	**TEST TYPE AND DATE**	**TEST INTERVAL (meters)**	**TEMPERATURE RANGE (^{o}C)**	**ELECTRICAL CONDUCTIVITY RANGE (µS/cm)**	**pH RANGE (s.u.)**
DHRES-04	Cased well 27 Feb 2009	539.5 – 706.7	33.4 – 33.9	382 – 427	8.49 – 8.58
DHRES-04	Constant-rate pumping test 21 Feb 2009	539.5 – 706.7	27.8 – 34.1	375 – 371	9.43 – 9.75

DHRES-04 Hydraulic Testing

DHRES-04 Cased Well Airlift Test

Following installation of production casing, a 4-hour airlift test was conducted to develop DHRES-04 and to investigate preliminary hydraulic parameters and water quality in the Tvs at this location. Screened interval is from 539.5 to 706.7 meters bls. Depth to pre-pumping water level was 154.8 meters bls. Airlifting started at 16:36 and stopped at 20:36, on February 27, 2009. The discharge rate decreased from an initial rate of about 3.1 L/s to a final rate of about 2.5 L/s; average rate was 2.9 L/s. Specific electrical conductance of pumped water declined from initial value of about 427 microSiemens per centimeter (µS/cm) to about 382 µS/cm. During recovery, water levels were manually measured through the dual-wall drill pipe using an

electric water level sounder. A graph of the recovery data and analysis is presented on **Figure 7**. Straight-line analysis using the Theis recovery method indicates transmissivity of 1 m^2/d. Based on transmissivity calculated from recovery data and a saturated interval of 167.2 meters (length of screened interval) the estimated hydraulic conductivity is 3 x 10^{-6} cm/s. A summary of test data and the results of the analysis are given in **Table 8**.

DHRES-04 Constant-Rate Pumping Test

Following the pump installation, a 12-hour constant-rate pumping test was conducted to further develop the well, and to investigate hydraulic parameters and water quality in the Tvs at this location. Screened interval is from 539.5 to 706.7 meters bls. Depth to pre-pumping water level was 126.1 meters bls. Pumping started at 09:00 and stopped at 21:00, on December 21, 2009. The discharge rate was 0.4 L/s. Specific electrical conductance of pumped water was relatively stable at approximately 370 µS/cm. During drawdown and recovery, water levels were measured with a Level TROLL 30 psi vented transducer, through the 1-inch PVC access tube. Water levels were also measured manually during drawdown and the first 15 minutes of recovery. A graph of the drawdown and recovery data and analysis is shown on **Figure 8**. Straight-line analysis of drawdown data using the Cooper-Jacob (1946) method yields an estimated transmissivity of 1 m^2/d; analysis of recovery data using the Theis recovery method yields an estimated transmissivity of 2 m^2/d. Based on transmissivity calculated from recovery data and a saturated interval of 167.2 meters (length of screened interval) the estimated hydraulic conductivity is 6 x 10^{-6} cm/s. A summary of test data and the results of the analysis are given in **Table 8**.

DHRES-03 and DHRES-05 were monitored during the pumping and recovery period at DHRES-04. Responses were observed at the lowermost two transducers installed at DHRES-03. Maximum observed drawdown at transducer DHRES-03_335 (585 meters bls) was 1.7 meters; maximum observed drawdown at transducer DHRES-03_539 (381 meters bls) was 0.5 meters. Graphs of the drawdown and recovery data for the DHRES-03_335 and DHRES-03_539 are shown on **Figures 9 and 10**, respectively. These responses were not suitable for analysis and did not yield estimates of aquifer parameters. No discernable response was observed at DHRES-05.

TABLE 8. SUMMARY OF HYDRAULIC TESTS CONDUCTED AT HYDROLOGIC TEST WELL DHRES-04		
WELL IDENTIFIER	**DHRES-04**	**DHRES-04**
Test Type	Airlift test	Constant-rate pumping test
Description of Hydrologic Testing Zone (meters bls)	**Cased well** (total depth 713.2 meters): perforated interval 539.5 to 706.7 meters bls	**Cased well** (total depth 713.2 meters): perforated interval 539.5 to 706.7 meters bls
Geologic Units in Testing Zone	Tertiary Volcanic Rocks (Tvs)	Tertiary Volcanic Rocks (Tvs)
Test Duration (hours)	4	12
Pre-pumping Depth to Water (meters bls)	154.8	126.1
Average Discharge Rate (L/s)	2.9	0.4
Maximum Drawdown (meters)	>104	27.95
Transmissivity from recovery data (m^2/d)	1	2
Saturated thickness (meters)	167.2 (length of perforated interval)	167.2 (length of perforated interval)
Hydraulic Conductivity (cm/s)	3×10^{-6}	6×10^{-6}

DHRES-05 Hydraulic Testing

DHRES-05 Cased Well Slug Test

Following initial casing installation, a slug test was conducted to investigate hydraulic parameters in the QTg at this location. Screened intervals are from 496.3 to 721.4 meters bls and from 862.8 to 888.5 meters bls. Depth to pre-test water level was 17.3 meters bls. The slug volume was 3744 cm^3. The slug was installed at 19:24, on July 28, 2009 and removed at 13:31, on August 17, 2009. Water levels were measured using a Level TROLL vented transducer. A summary of test data and the results of the analysis are given in **Table 9**. A graph of the water level data and analysis is shown on **Figure 11**. Analysis of slug tests using the KGS model (Hyder and others, 1994) indicates a specific storage of 5×10^{-3} m^{-1} and an average hydraulic conductivity of 7×10^{-9} cm/s.

DHRES-05B Cased Well Airlift Test

Following casing installation at DHRES-05B airlift testing was attempted; however airlifting could not be sustained which indicates that transmissivity in the Tal at this location is very small.

TABLE 9. SUMMARY OF HYDRAULIC TESTS CONDUCTED AT HYDROLOGIC TEST WELL DHRES-05/DHRES-05B

WELL IDENTIFIER	DHRES-05	DHRES-05B
Test Type	Slug test	Airlift test
Description of Hydrologic Testing Zone (meters bls)	**Cased well** (total depth 920.7 meters): perforated intervals 496.3 to 721.4 and 862.8 to 888.5 meters bls	**Cased well** (total depth 1,224.7 meters): perforated interval 955.6 to 1,219.8 meters bls
Approximate Borehole Volume (liters)	---	28,500
Geologic Units in Testing Zone	Gila Conglomerate (QTg)	Apache Leap Tuff (Tal)
Test Duration (days)	19+	Discontinued
Pre-pumping Depth to Water (meters bls)	17.0 (slug in) 16.4 (slug out)	96.78
Average Discharge Rate (L/s)	Not applicable	Not sustainable
Maximum Drawdown (meters)	Not applicable	>132
Specific Storage (m^{-1})	5×10^{-3}	Not determined
Hydraulic Conductivity (cm/s)	7×10^{-9}	Not determined

GROUNDWATER SAMPLING

Groundwater samples were collected from the open borehole at DHRES-03 following drilling and after the airlift and constant-rate pumping tests at DHRES-04. Sample identifiers and water quality parameters are given in **Table 10**. Groundwater samples are collected during drilling and airlift testing to obtain an initial indication of water quality. Data considered to be most representative of the hydrochemical composition of formation water are those generated from samples collected at the end of pumping tests. These data and associated discussion are provided in M&A (2011).

TABLE 10. WATER SAMPLES COLLECTED AT DHRES-03 AND DHRES-04

SAMPLE IDENTIFIER	SAMPLE DESCRIPTION	DATE	TIME	FIELD PARAMETERS		
				TEMP (°C)	pH (s.u.)	ELECTRICAL CONDUCTIVITY (µS/cm)
RESE-1000274	DHRES-03, open borehole at total depth	10-Feb-09	17:15	35.2	8.53	382.1
RESE-1000275	DHRES-04, cased airlift	27-Feb-09	19:41	33.6	8.57	385.2
RESE-1000291	DHRES-04, constant-rate pumping test	21-Dec-09	19:15	33.9	9.75	370.5

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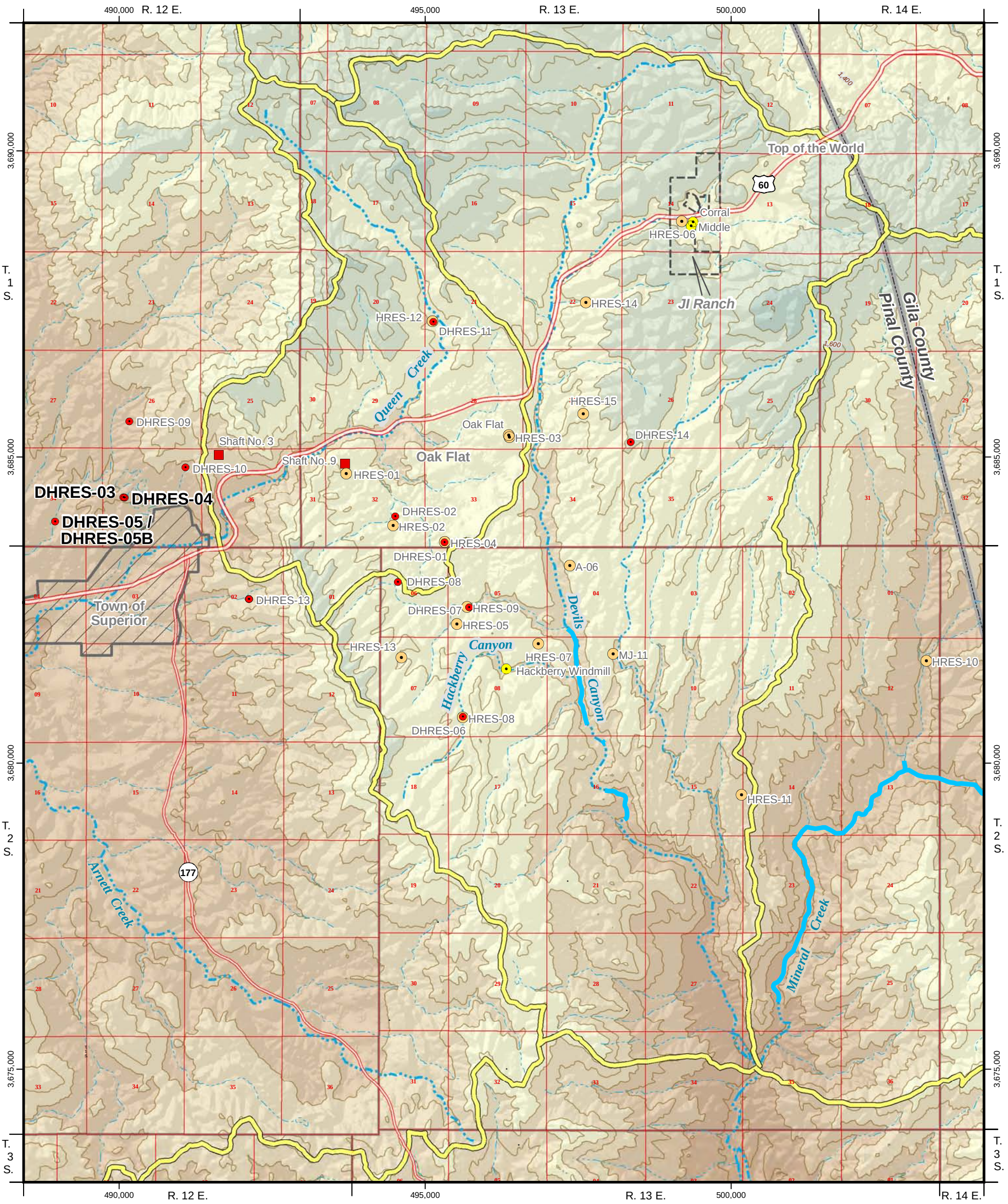


EXPLANATION

- Watershed Boundary
- Perennial Reach

Groundwater Monitoring Sites

- Shallow Alluvial Aquifer Monitor Well
- Apache Leap Tuff Aquifer Monitor Well
- Deep Groundwater System Monitor Well
- Shaft

Elevation Range

(meters above mean sea level)

- 1,600 - 1,800
- 1,400 - 1,600
- 1,200 - 1,400
- 1,000 - 1,200
- 800 - 1,000
- 600 - 800

N

0 0.5 1 1.5 2

Miles

Resolution Copper Mining

DHRES-03, DHRES-04, AND DHRES-05 / DHRES-05B WELL LOCATIONS

MONTGOMERY & ASSOCIATES
Water Resource Consultants

2011

FIGURE 1

\GIS-Tuc\Projects\605\605.3\Welloc_DHRES_3_4_5.mxd\13June2011

Cement
12-1/4-inch borehole
7-5/8-inch blank steel casing
6-3/4-inch borehole
Cement
3-inch blank steel casing
Piezometer: vibrating-wire pressure transducer attached to outside of casing for monitoring piezometric pressure; cables extend to land surface. Specially designed fins and a PVC centralizer installed to protect each transducer.
6-1/2-inch borehole
Specialized pressure grout; grout mix ratio by weight - 2.5 water: 1.0 cement: 0.3 bentonite
3-inch steel casing perforated with 6 approximately 1-inch diameter holes bored through casing and beveled at bottom

Depth Below Land Surface, In meters	(feet)
0	(0)
11.9	(39)
12.2	(40)
45.7	(150)
86.8	(285)
107.9	(354)
133.0	(436)
138.2	(454)
152.4	(500)
191.5	(628)
251.5	(825)
368.8	(1,210)
380.8	(1,249)
527.3	(1,730)
541.0	(1,775)
557.8	(1,830)
562.4	(1,845)
584.7	(1,918)
585.1	(1,920)
590.8	(1,939)
593.1	(1,946)
598.0	(1,962)

25Feb2011

Hydrogeologic Units: Gila Conglomerate (QTg); Mixed Lithologies; Tal-rich; Moderately lithified Tal-rich; Well lithified; Tertiary volc. (Tvs); Tuff; Tuff Sandstone; Basalt; Paleosol

Fracture Summary Log

NO DATA

Drilling Penetration Rate (min. per drill rod) 0 25 50 75 100

Water Production Rate During Drilling Operations (liters per second) 0 2 4 6 8

Reverse Circulation Air-Percussion (Hammer)

Borehole Imaging Available

Acoustic Televiewer

Caliper (inches) 0 5 10 15

Temperature (degrees C) 0 10 20 30 40

Fluid Resistivity (ohm-meters) 0 5 10 15

Natural Gamma (API units) 0 50 100 150 200

Spontaneous Potential (millivolts) -400 -300 -200

Single Point Resistance (ohms) 0 50 100 150 200

16-inch and 64-inch Normal Resistivity (ohm-meters) 0 100 200 300 400

RX2 Sonic Velocity 100 µSec 1,000

RX2 Travel Time 100 µSec 1,000

25063 TODD KEAY REGISTERED GEOLOGIST CERTIFICATE NO. Date Signed 6/30/2011 ARIZONA U.S.A. Expires 6/30/2012

CADASTRAL: (D-1-12) 35bcd	ADWR NO: 55-218637
NORTHING: 3884348.674	EASTING: 490073.076
LAND SURFACE ELEVATION: 920.01	
DATUM: NAD 27 HORIZONTAL: UTM 12 VERTICAL: NGVD 29 METERS	

EXPLANATION

- No Data
- No Fracturing Evident
- Minor Fracturing
- Moderate Fracturing
- Major Fracturing

- DHRES-03_782
- DHRES-03_729
- DHRES-03_539
- DHRES-03_335

Total hydraulic head expressed as depth to water, corresponding to pressure transducer measurements at each discrete elevation

Resolution Copper Mining

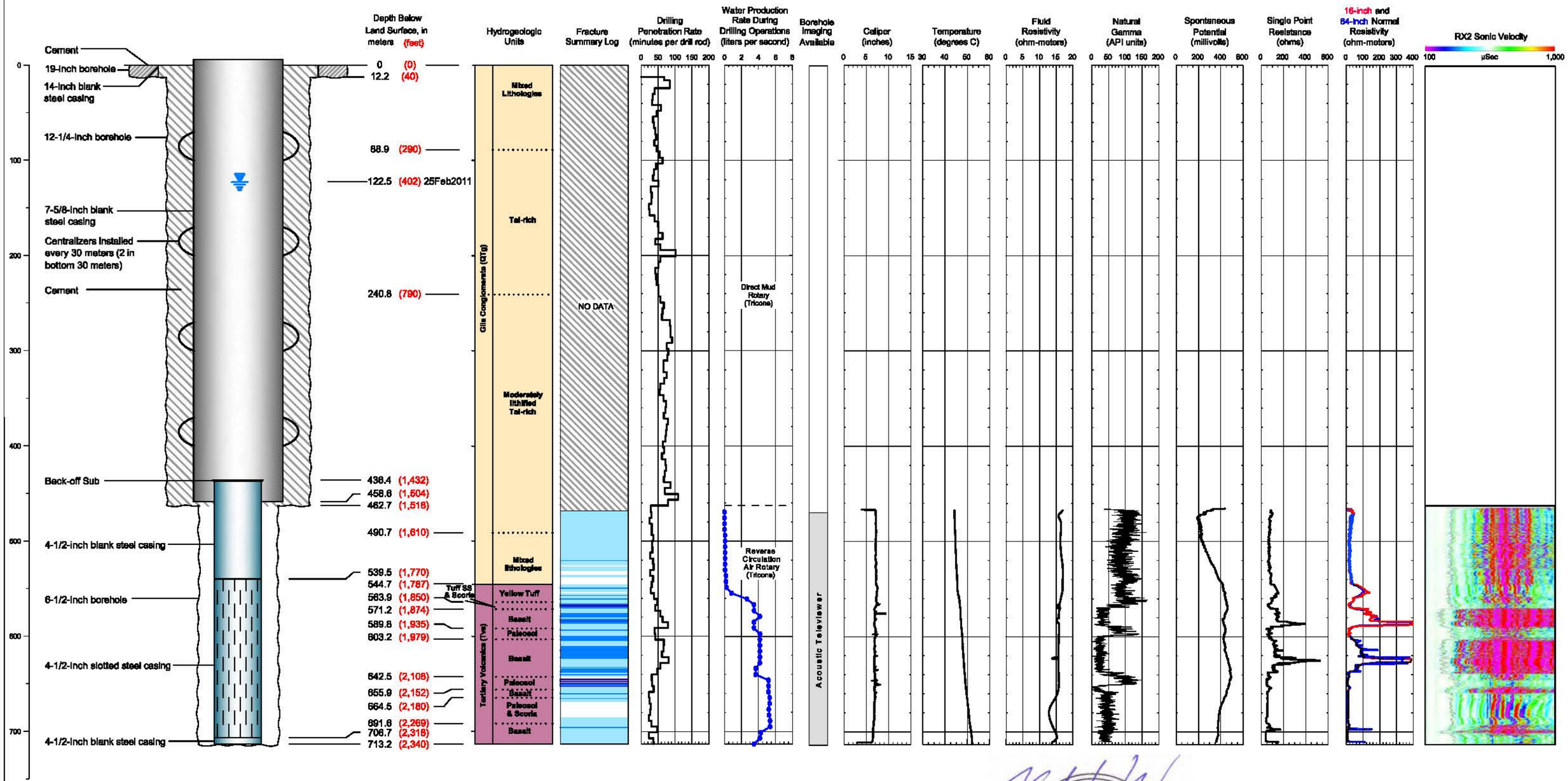
MONTGOMERY & ASSOCIATES Water Resource Consultants

DHRES-03
SCHEMATIC DIAGRAM OF WELL CONSTRUCTION

Version: June 17, 2011

FIGURE 2

505\WellSchematics_2009\Site-DHRES-3-WS-LOG35\17June11



CADASTRAL: (D-1-12) 35bcd	ADWR NO: 55-218676
NORTHING: 3684343.911	EASTING: 490094.914
LAND SURFACE ELEVATION: 920.33	
DATUM: NAD 27 HORIZONTAL: UTM 12 VERTICAL: NGVD 29 METERS	

EXPLANATION

- No Data
- No Fracturing Evident
- Minor Fracturing
- Moderate Fracturing
- Major Fracturing
- Non-pumping Water Level

REGISTERED GEOLOGIST
CERTIFICATE NO.
25063
TODD
KEAY
Date Signed 6/30/2012
ARIZONA U.S.A.
Expires 6/30/2014

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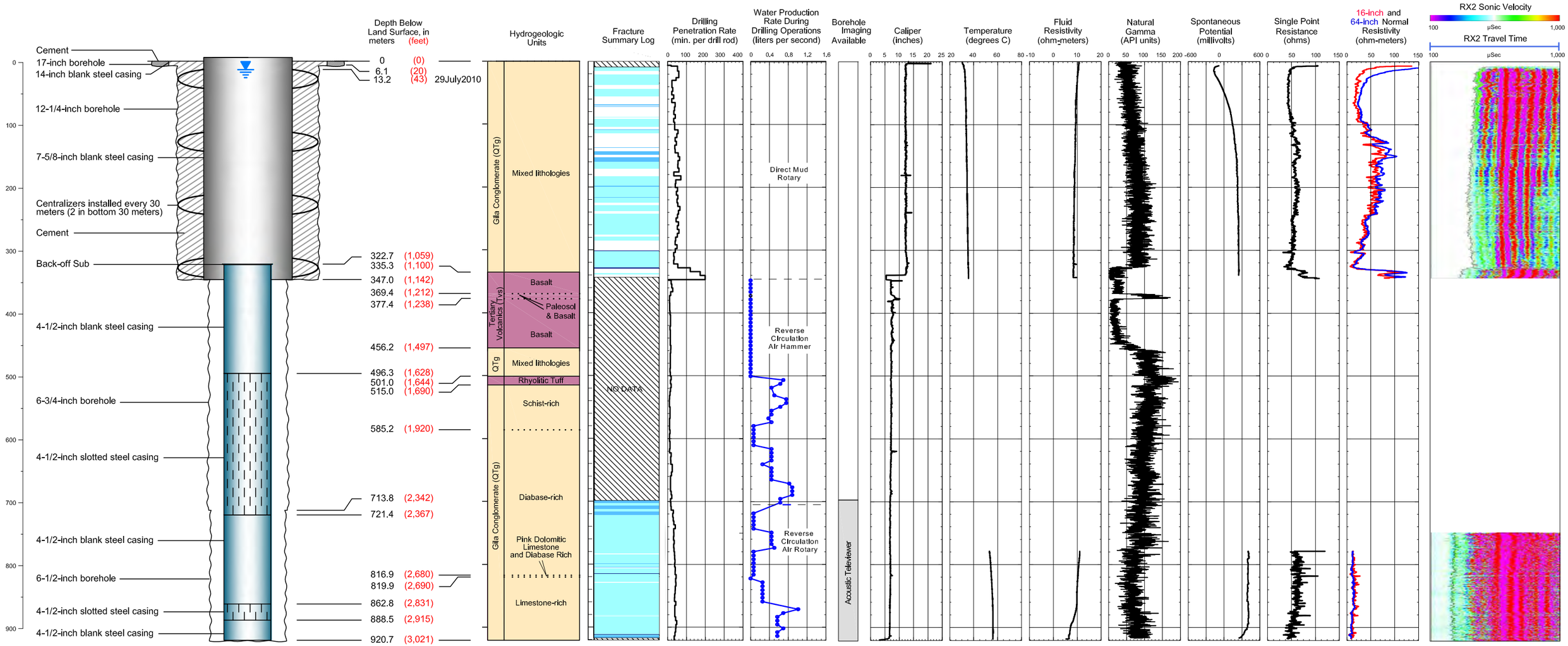
Water Resource Consultants

DHRES-04
SCHEMATIC DIAGRAM OF WELL CONSTRUCTION

Version: June 17, 2011

FIGURE 3

806\WellSchematics_2009\Site_DHRES-4-WS-LOGS\17June2011



CADASTRAL: (D-1-12) 34dbc	ADWR NO: 55-218677
NORTHING: 3683951.417	EASTING: 488957.196
LAND SURFACE ELEVATION: 846.20	
DATUM: NAD 27 HORIZONTAL: UTM 12 VERTICAL: NGVD 29 METERS	

* Geologic contacts have been adjusted using geophysics obtained in 2010, during the modification of DHRES-05.

EXPLANATION

- No Fracturing Evident
- Minor Fracturing
- Moderate Fracturing
- Major Fracturing
- Non-pumping Water Level

REGISTERED GEOLOGIST
CERTIFICATE NO. 25063
TODD KEAY
Date Signed 1-27-2011
ARIZONA U.S.A.
Expires 6/30/2012

Resolution Copper Mining

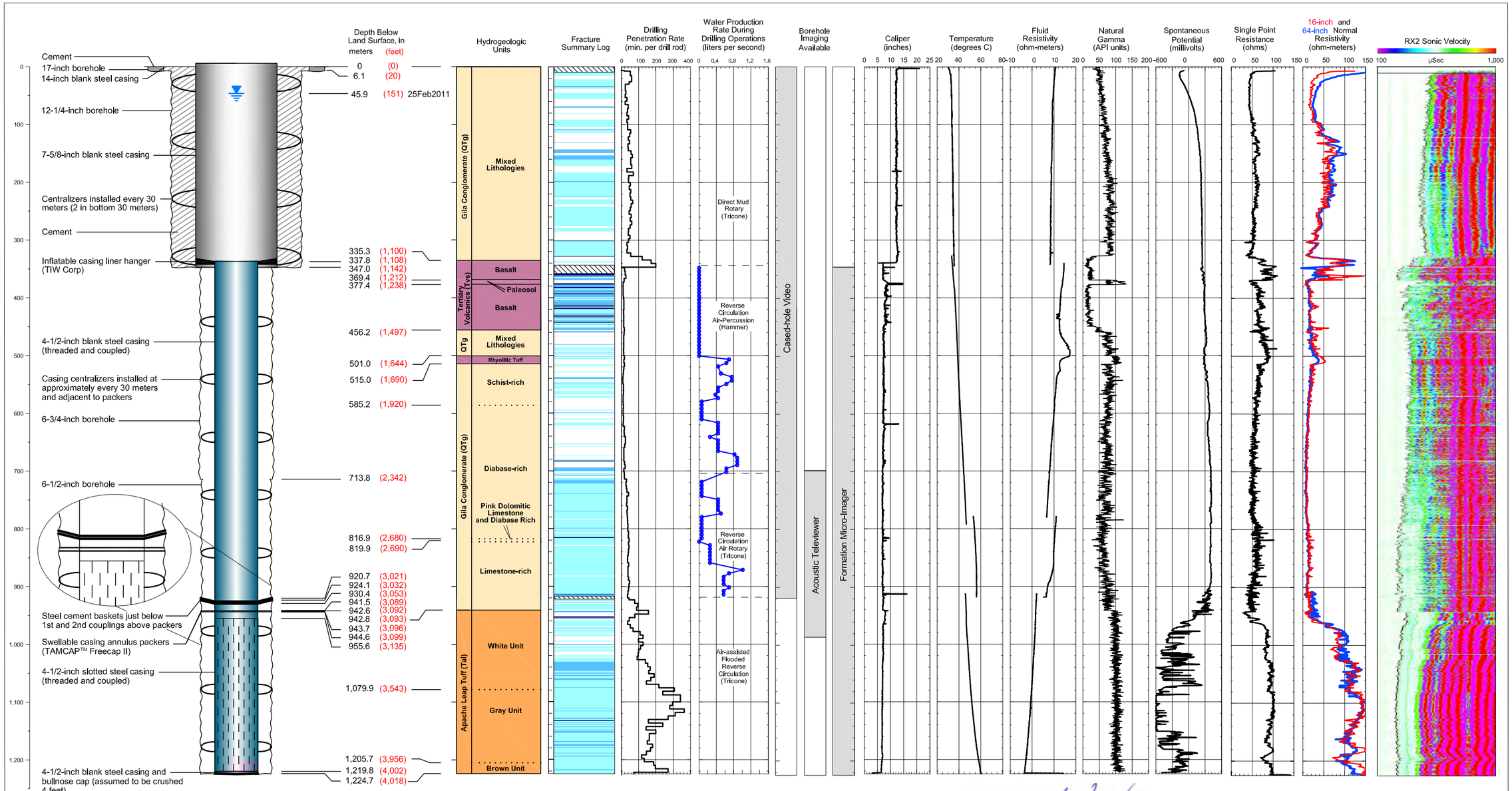
MONTGOMERY & ASSOCIATES
Water Resource Consultants

DHRES-05
SCHEMATIC DIAGRAM OF ORIGINAL WELL CONSTRUCTION

Version: June 17, 2011

FIGURE 4

605\WellSchematics_2009\DHRES-5-WS-LOGS\17June2011



CADASTRAL: (D-1-12) 34dbc	ADWR NO: 55-218677
NORTHING: 3683951.417	EASTING: 488957.196
LAND SURFACE ELEVATION: 846.20	
DATUM: NAD 27 HORIZONTAL: UTM 12 VERTICAL: NGVD 29 METERS	

EXPLANATION

- No Data
- No Fracturing Evident
- Minor Fracturing
- Moderate Fracturing
- Major Fracturing
- Non-pumping Water Level

REGISTERED GEOLOGIST
CERTIFICATE NO.
25063
TODD
KEAY
Date Signed 6/17/2011
ARIZONA U.S.A.
Expires 6/30/2012

Resolution Copper Mining

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Water Resource Consultants

DHRES-05B
SCHEMATIC DIAGRAM OF FINAL WELL CONSTRUCTION

Version: June 17, 2011

FIGURE 5

605\WellSchematics_2010\Site_DHRES-05Bws_Extended-LOGS\17June2011

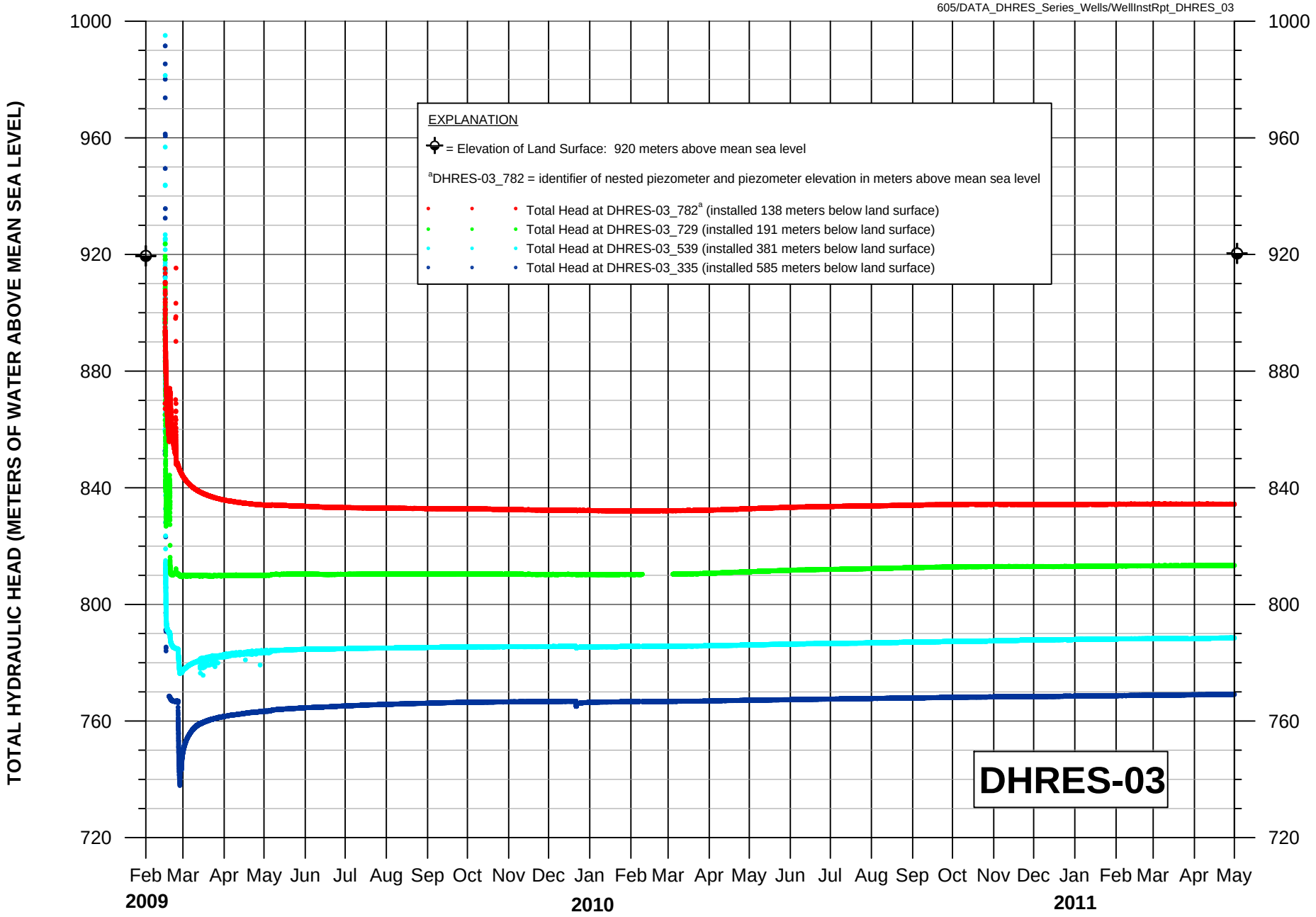

FIGURE 6. HYDROGRAPH OF TOTAL HYDRAULIC HEAD FOR GROUTED VIBRATING-WIRE PIEZOMETERS AT DEEP HYDROLOGIC TEST WELL DHRES-03 RESOLUTION PROJECT, PINAL COUNTY, ARIZONA

MONTGOMERY & ASSOCIATES

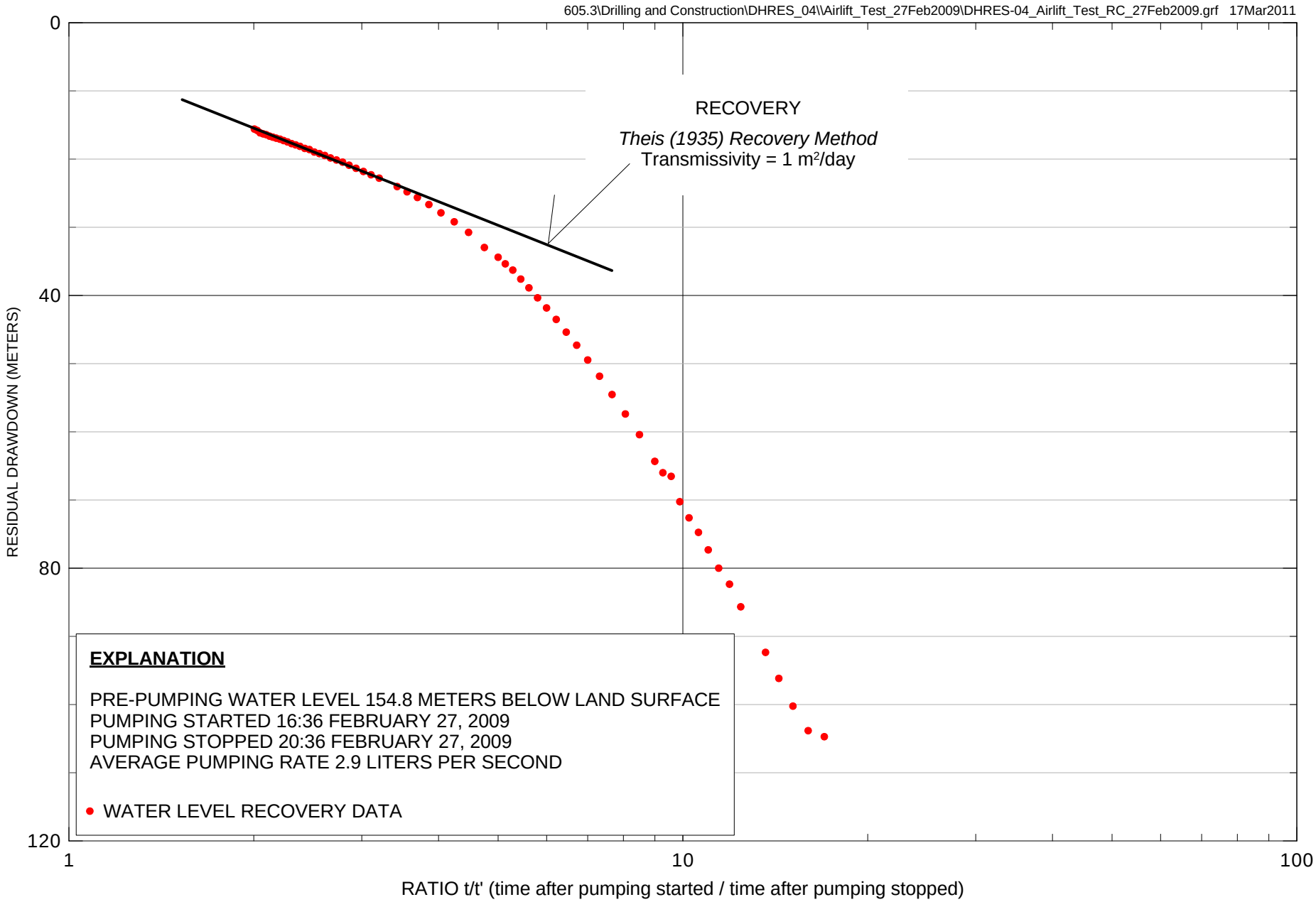

FIGURE 7. RECOVERY GRAPH FOR 4-HOUR AIRLIFT TEST AT CASED WELL DHRES-04, RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

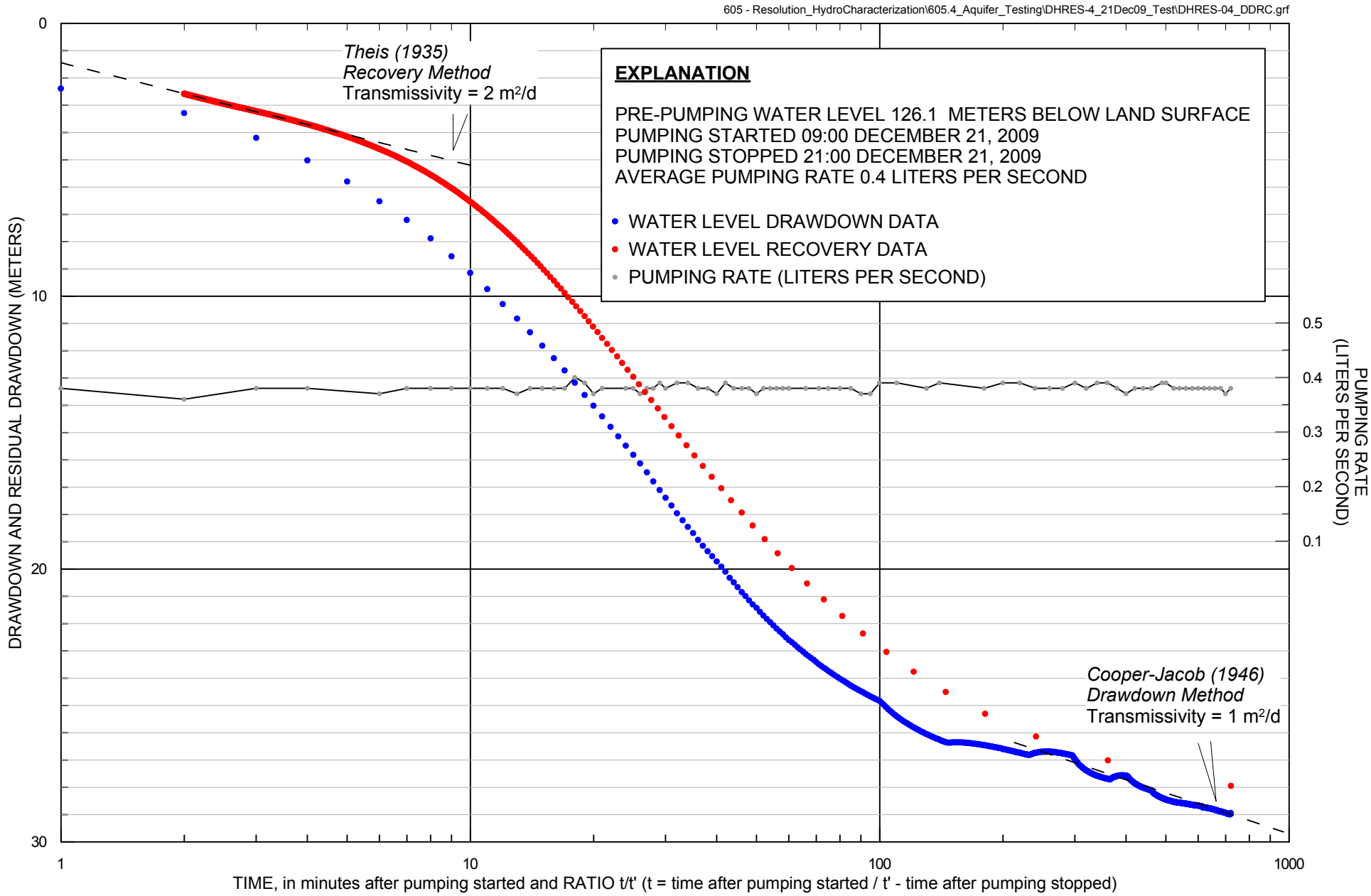

FIGURE 8. DRAWDOWN AND RECOVERY GRAPH FOR WELL DHRES-04 DURING CONSTANT-RATE PUMPING TEST, RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

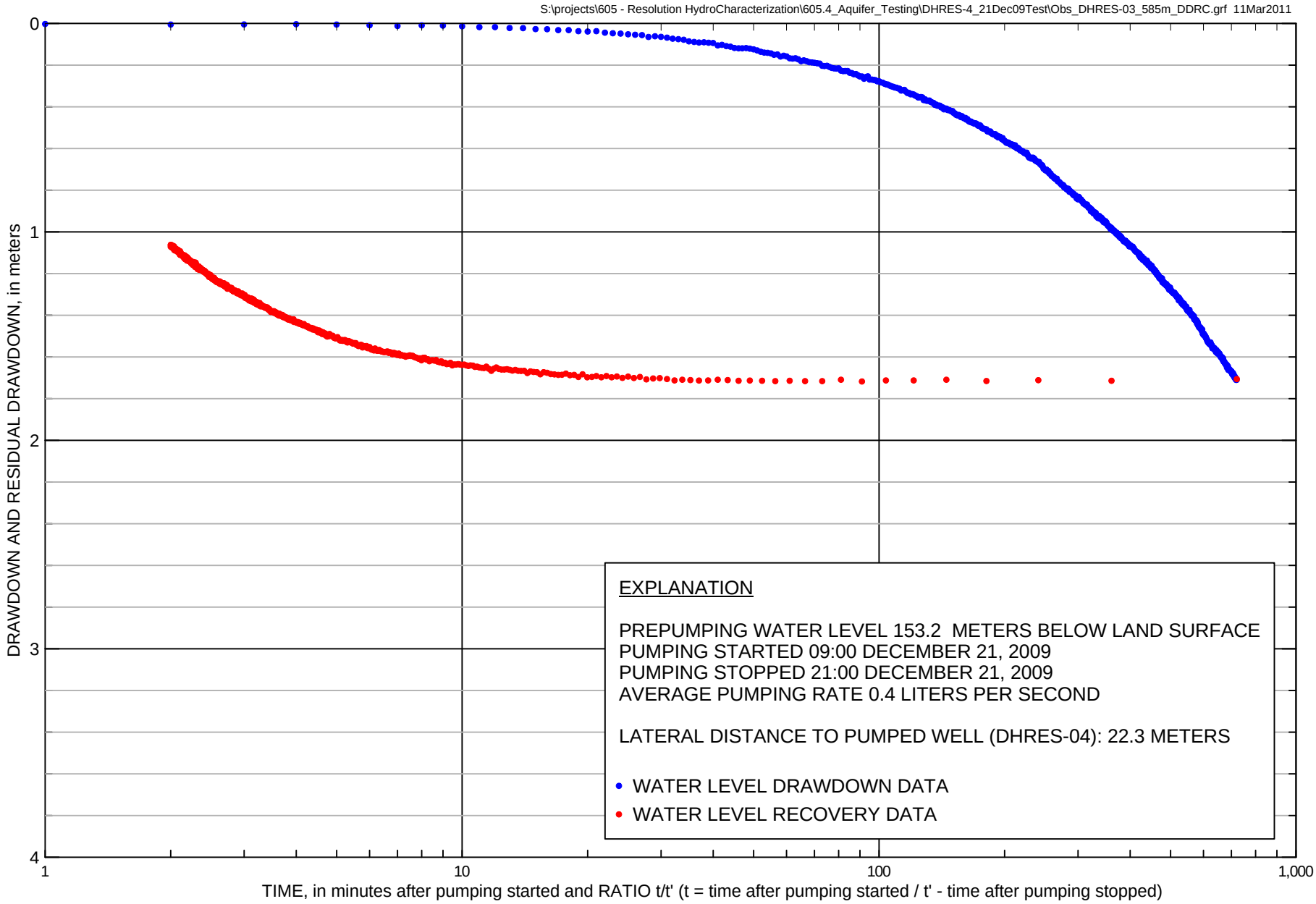

FIGURE 9. DRAWDOWN AND RECOVERY AT PIEZOMETER DHRES-03_335 DURING 12-HOUR CONSTANT-RATE PUMPING TEST AT WELL DHRES-04, RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

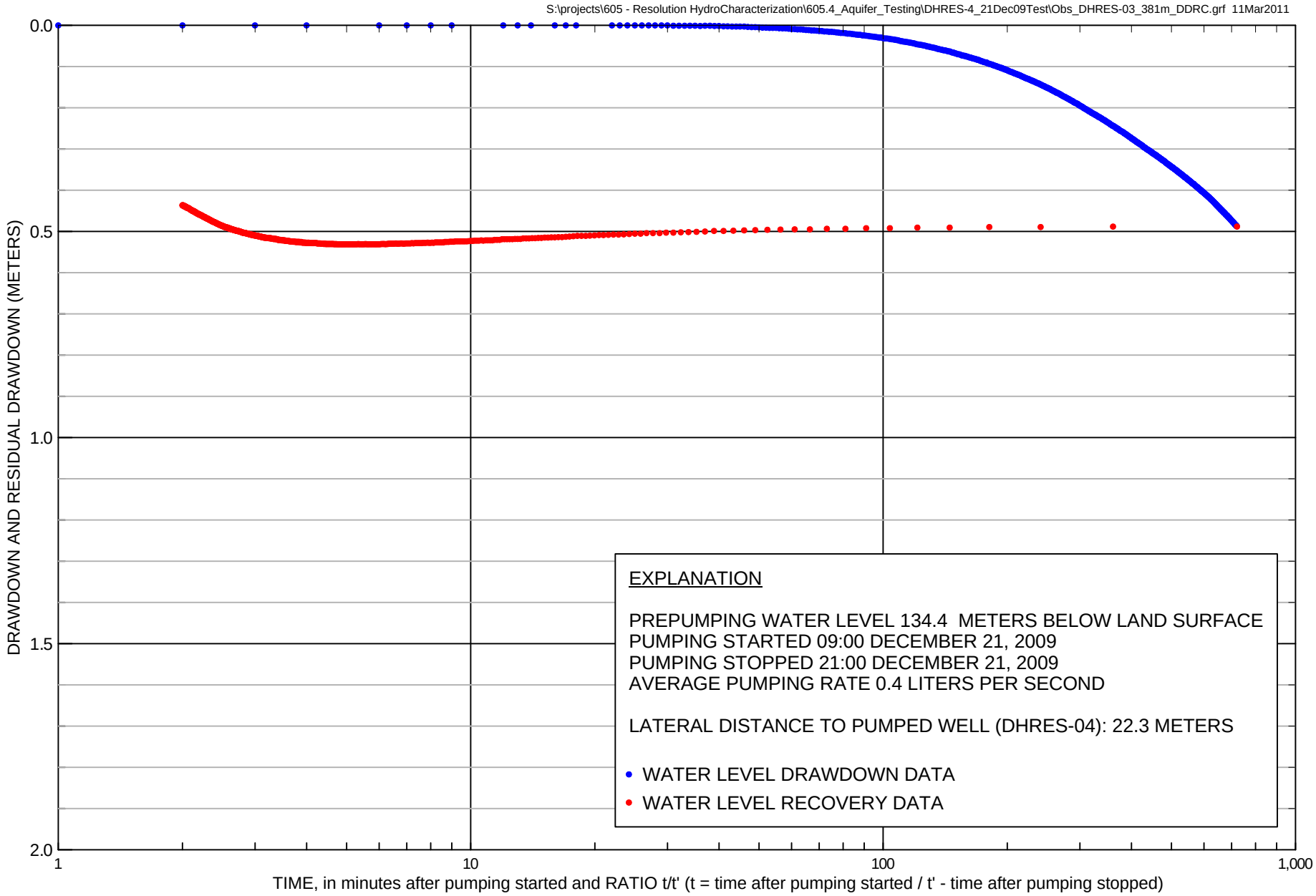

FIGURE 10. DRAWDOWN AND RECOVERY AT PIEZOMETER DHRES-03_539 DURING 12-HOUR CONSTANT-RATE PUMPING TEST AT WELL DHRES-04, RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

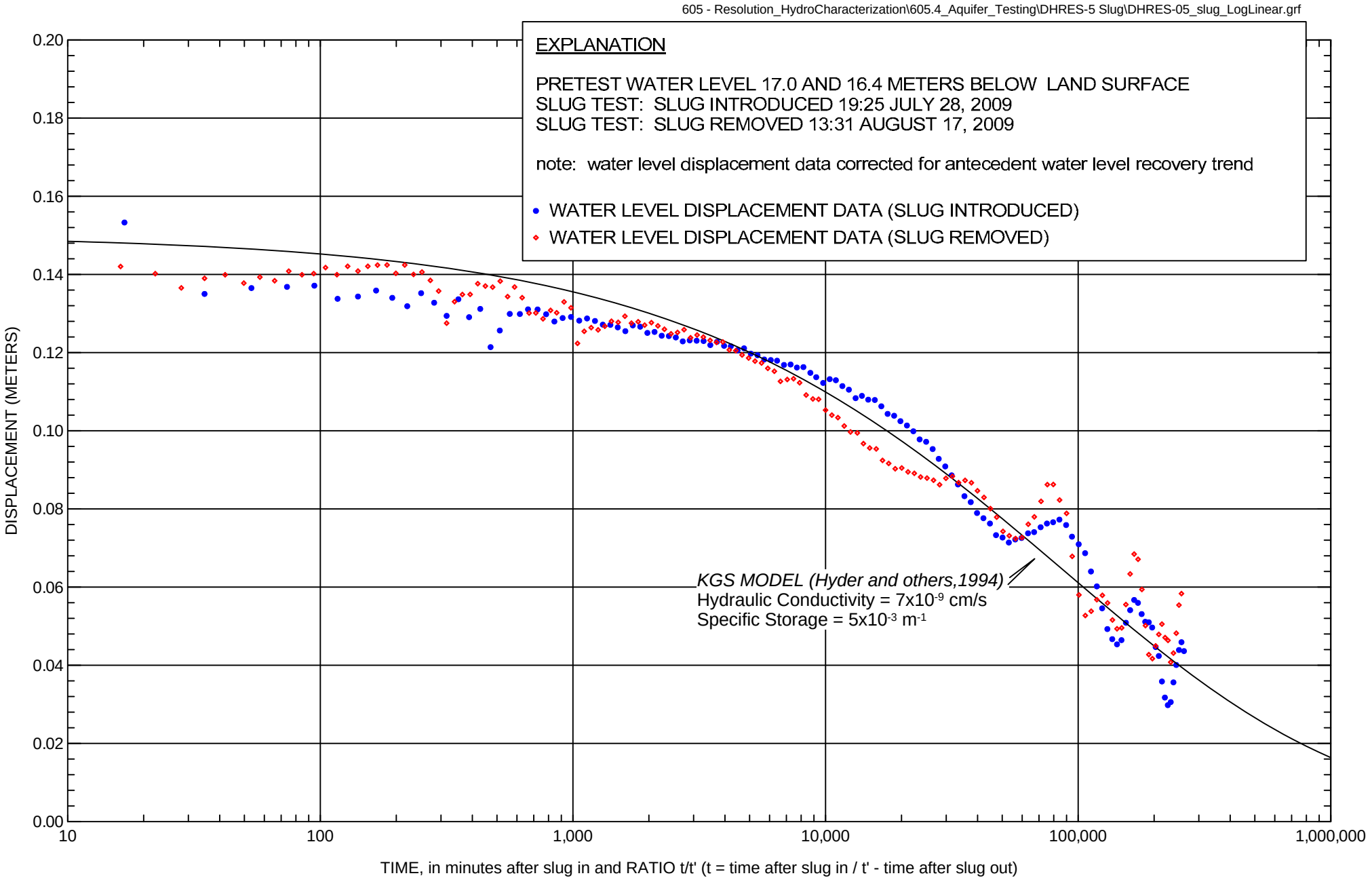

FIGURE 11. WATER LEVEL DISPLACEMENT GRAPH FOR WELL DHRES-05 DURING SLUG TEST OPERATIONS, RESOLUTION PROJECT

MONTGOMERY & ASSOCIATES

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
0 - 10	0.0 - 3.0	Clast-supported conglomerate; brown [10YR5/3]; weakly lithified; gravel; cut chips are clasts of black, white and green diabase with trace magnetite, pink and orange tuff, gray and brown sandstone and quartzite, black siliceous mudstone, trace light gray limestone; reaction to acid: moderate	some iron oxide staining, trace clear rhombohedral calcite crystals	CONVENTIONAL AIR ROTARY; angular to subangular chips up to 1.0 cm
10 - 20	3.0 - 6.1	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are 50% clasts of black, white and green diabase with magnetite, 10% clasts of green quartzite, gray limestone, pink and orange tuff, light gray aphanitic tuff, and 40% matrix chips of brown sandy siltstone; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.6 cm
20 - 30	6.1 - 9.1	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are 40% clasts of black, white and green diabase with magnetite, 20% clasts of green quartzite, gray limestone, pink and orange tuff, light gray aphanitic tuff, and 40% matrix chips of brown sandy siltstone; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace gypsum	subangular to subrounded chips up to 1.5 cm
30 - 40	9.1 - 12.2	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are 40% clasts of black, white and green diabase with magnetite, 20% clasts of green quartzite, gray limestone, pink and orange tuff, light gray aphanitic tuff, and 40% matrix chips of brown sandy siltstone; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm
40 - 50	12.2 - 15.2	Matrix-supported conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 60% black, white and green diabase, 30% grayish-green and brown quartzite and sandstone, 10% orange and pink tuff, black siliceous mudstone, gray limestone, and orangish-gray chert, trace matrix chips of sandy siltstone; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	REVERSE CIRCULATION AIR PERCUSSION; subangular to subrounded chips up to 2.2 cm; driller washed this sample

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
50 - 60	15.2 - 18.3	Matrix-supported conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 60% black, white and green diabase, 30% grayish-green and brown quartzite and sandstone, 10% orange and pink tuff, black siliceous mudstone, gray limestone, and orangish-gray chert, trace matrix chips of sandy siltstone; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
60 - 70	18.3 - 21.3	Matrix-supported conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% black, white and green diabase, 40% grayish-green and brown quartzite and sandstone, 10% orange and pink tuff, black siliceous mudstone, gray limestone, and orangish-gray chert, trace matrix chips of sandy siltstone; reaction to acid: moderate	common iron oxide staining (hematite)	subangular to subrounded chips up to 1.3 cm
70 - 80	21.3 - 24.4	Matrix-supported conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% black, white and green diabase, 40% grayish-green and brown quartzite and sandstone, 10% orange and pink tuff, black siliceous mudstone, gray limestone, and orangish-gray chert, trace matrix chips of sandy siltstone; reaction to acid: strong	common iron oxide staining (hematite)	subangular to subrounded chips up to 0.9 cm
80 - 90	24.4 - 27.4	Matrix-supported conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% black, white and green diabase with trace native copper, 40% grayish-green and brown quartzite and sandstone, 10% orange and pink tuff, black siliceous mudstone, gray limestone, and orangish-gray chert, trace matrix chips of sandy siltstone; reaction to acid: strong	common iron oxide staining (hematite), calcite in sand fraction	subangular to subrounded chips up to 0.8 cm
90 - 100	27.4 - 30.5	Matrix-supported conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% black, white and green diabase, 40% grayish-green and brown quartzite and sandstone, 10% orange and pink tuff, black siliceous mudstone, gray limestone, and orangish-gray chert, trace matrix chips of sandy siltstone; reaction to acid: strong	common iron oxide staining (hematite)	subangular to subrounded chips up to 0.6 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
100 - 110	30.5 - 33.5	Matrix-supported conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% black, white and green diabase, 40% grayish-green and brown quartzite and sandstone, 10% orange and pink tuff, black siliceous mudstone, gray limestone, and orangish-gray chert, trace matrix chips of sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (hematite)	subangular to subrounded chips up to 1.0 cm
110 - 120	33.5 - 36.6	Matrix-supported conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% black, white and green diabase, 40% grayish-green and brown quartzite and sandstone, 10% orange and pink tuff, black siliceous mudstone, gray limestone, and orangish-gray chert, trace matrix chips of sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (hematite)	subangular to subrounded chips up to 0.7 cm
120 - 130	36.6 - 39.6	Matrix-supported conglomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% black, white and green diabase, 40% grayish-green and brown quartzite and sandstone, 10% orange and pink tuff, black siliceous mudstone, gray limestone, and orangish-gray chert, trace matrix chips of sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm
130 - 140	39.6 - 42.7	Matrix-supported conglomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% black, white and green diabase, 40% grayish-green and brown quartzite and sandstone, 10% orange and pink tuff, black siliceous mudstone, gray limestone, and orangish-gray chert, trace matrix chips of sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
140 - 150	42.7 - 45.7	Matrix-supported conglomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% black, white, green and red diabase with trace magnetite, 40% red and gray sandstone and purple and brown quartzite, 10% light gray and orangish-brown banded tuff, trace gray limestone, trace matrix chips of pink sandy siltstone; overall sample is 25% fines; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
150 - 160	45.7 - 48.8	Matrix-supported conglomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% black, white, green and red diabase with trace magnetite, 40% red and gray sandstone and purple and brown quartzite, 10% light gray and orangish-brown banded tuff, trace gray limestone, trace black siliceous mudstone, trace matrix chips of pink sandy siltstone; overall sample is 40% fines; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
160 - 170	48.8 - 51.8	Matrix-supported conglomerate; NO SAMPLE		
GILA CONGLOMERATE- Tal-rich (QTg)				
170 - 180	51.8 - 54.9	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% pink and orange tuff, 40% white, black, green and orange diabase, 10% purple and gray chert, gray limestone, gray and red sandstone and quartzite, and light gray tuff, trace matrix chips of pink sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
180 - 190	54.9 - 57.9	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% pink and orange tuff, 40% white, black, green and orange diabase, 10% purple and gray chert, gray limestone, gray and red sandstone and quartzite, and light gray tuff, trace vein quartz, trace matrix chips of pink sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
190 - 200	57.9 - 61.0	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 50% pink and orange tuff, 40% white, black, green and orange diabase, 10% purple and gray chert, gray limestone, gray and red sandstone and quartzite, and light gray tuff, trace vein quartz, trace matrix chips of pink sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm
200 - 210	61.0 - 64.0	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 40% pink and orange tuff with large phenocrysts of white feldspar and black biotite and very small lithic fragments, 30% white, orange and brown sandstone and quartzite, 20% white, black and green diabase with trace magnetite, 10% grayish brown mudstone, gray chert and vein quartz; overall sample is 40% fines; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm
210 - 220	64.0 - 67.1	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 40% pink and orange tuff with large phenocrysts of white feldspar and black biotite and very small lithic fragments, 30% white, black and green diabase with trace magnetite, 20% white, orange and brown sandstone and quartzite, 10% grayish brown mudstone, gray chert and vein quartz; overall sample is 40% fines; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
220 - 230	67.1 - 70.1	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of 40% pink tuff (Tal), 40% black, white and green diabase, orange and white sandstone and quartzite, gray chert, gray limestone and vein quartz, trace matrix chips of pink sandy siltstone; overall sample is 40% fines; reaction to acid: strong	some iron oxide staining (limonite), calcite	subangular to subrounded chips up to 1.3 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
230 - 240	70.1 - 73.2	Tal-rich conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of black, white and green diabase with trace magnetite, pink and orange tuff (Tal), orange, white and brown sandstone and quartzite, gray limestone, and vein quartz, trace matrix chips of pink sandy siltstone; overall sample is 40% fines; reaction to acid: strong	some iron oxide staining (limonite), trace calcite on fracture surfaces	subangular to subrounded chips up to 1.1 cm
240 - 250	73.2 - 76.2	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of black, white and green diabase with trace magnetite, pink and orange tuff (Tal), orange, white and brown sandstone and quartzite, gray limestone, and vein quartz, trace matrix chips of pink sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (limonite)	subangular to subrounded chips up to 0.5 cm
250 - 260	76.2 - 79.2	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; sandy silty gravel; cut chips are clasts of black, white and green diabase with trace magnetite, pink and orange tuff (Tal), orange, white and brown sandstone and quartzite, gray limestone, black siliceous mudstone, and vein quartz, trace matrix chips of pink sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (limonite)	subangular to subrounded chips up to 1.6 cm
260 - 270	79.2 - 82.3	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of black, white and green diabase with trace magnetite, pink and orange tuff (Tal), orange, white and brown sandstone and quartzite, gray limestone, black siliceous mudstone, and vein quartz, trace matrix chips of pink sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (limonite and hematite)	subangular to subrounded chips up to 1.0 cm; mostly sand-sized cuttings

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
270 - 280	82.3 - 85.3	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of black, white and green diabase with trace magnetite, pink and orange tuff (Tal), orange, white and brown sandstone and quartzite, gray limestone, black siliceous mudstone, and vein quartz, trace matrix chips of pink sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (limonite and hematite), trace magnetite on fracture surfaces	subangular to subrounded chips up to 1.4 cm; mostly sand-sized cuttings
280 - 290	85.3 - 88.4	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), 40% white, black and green diabase with trace magnetite, white, orange, green and brown sandstone and quartzite, gray limestone, black siliceous mudstone, and felsic aphanitic tuff, trace matrix chips of pinkish-brown sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.5 cm; mostly sand-sized cuttings
290 - 300	88.4 - 91.4	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), 40% white, black and green diabase with trace magnetite, white, orange, green and brown sandstone and quartzite, gray limestone, black siliceous mudstone, and felsic aphanitic tuff, trace matrix chips of pinkish-brown sandy siltstone; overall sample is 40% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm; mostly sand-sized cuttings
300 - 310	91.4 - 94.5	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 60% crystal-rich pink tuff (Tal) with pink aphanitic groundmass and phenocrysts of feldspar, quartz, biotite and trace magnetite, 40% white, black and green diabase with trace magnetite, brown and gray limestone, light gray and brown banded aphanitic tuff, brown gray, red and purple quartzite, and gray siltstone, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	some iron oxide staining (hematite)	subangular to subrounded chips up to 0.9 cm; most of the Tal chips are in the sand-fraction

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
310 - 320	94.5 - 97.5	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 60% crystal-rich pink tuff (Tal) with pink aphanitic groundmass and phenocrysts of feldspar, quartz, biotite and trace magnetite, 40% white, black and green diabase with trace magnetite, brown and gray limestone, light gray and brown banded aphanitic tuff, brown gray, red and purple quartzite, and red and gray siltstone, trace orangish-red chert, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	common iron oxide staining	subangular to subrounded chips up to 1.1 cm
320 - 330	97.5 - 100.6	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 60% crystal-rich pink tuff (Tal) with pink aphanitic groundmass and phenocrysts of feldspar, quartz, biotite and trace magnetite, 40% white, black and green diabase with trace magnetite, brown and gray limestone, light gray and brown banded aphanitic tuff, brown gray, red and purple quartzite, and gray siltstone, trace orangish-red chert, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	common iron oxide staining	subangular to subrounded chips up to 1.0 cm
330 - 340	100.6 - 103.6	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 60% crystal-rich pink tuff (Tal) with pink aphanitic groundmass and phenocrysts of feldspar, quartz, biotite and trace magnetite, 40% white, black and green diabase with trace magnetite, brown and gray limestone, light gray and brown banded aphanitic tuff, brown gray, red, orange and purple quartzite, and gray siltstone, trace orangish-red chert, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	common iron oxide staining	subangular to subrounded chips up to 0.6 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
340 - 350	103.6 - 106.7	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 60% crystal-rich pink tuff (Tal) with pink aphanitic groundmass and phenocrysts of feldspar, quartz, biotite and trace magnetite, 40% white, black and green diabase with trace magnetite, brown and gray limestone, light gray and brown banded aphanitic tuff, brown gray, red, orange and purple quartzite, and gray siltstone, trace orangish-red chert, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	common iron oxide staining	subangular to subrounded chips up to 1.6 cm
350 - 360	106.7 - 109.7	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 50% crystal-rich pink tuff (Tal) with pink aphanitic groundmass and phenocrysts of feldspar, quartz, biotite and trace magnetite, 50% white, black and green diabase with trace magnetite, brown and gray limestone, light gray and brown banded aphanitic tuff, brown gray, red, orange and purple quartzite, and gray siltstone, trace orangish-red chert, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	some iron oxide staining	subangular to subrounded chips up to 1.7 cm
360 - 370	109.7 - 112.8	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 60% black, white and green diabase with trace magnetite, white, gray and brown quartzite, gray limestone, gray chert, and vein quartz, 40% pink tuff (Tal), trace black basalt, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	some iron oxide staining, calcite	subangular to subrounded chips up to 1.5 cm
370 - 380	112.8 - 115.8	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 60% pink tuff (Tal), 40% white, black and green diabase, gray and green limestone, gray and orange chert, and gray and brown quartzite, trace felsic aphanitic tuff, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm; mostly sand-sized cuttings

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
380 - 390	115.8 - 118.9	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 60% pink tuff (Tal), 40% white, black and green diabase, gray and green limestone, gray and orange chert, and gray and brown quartzite, trace felsic aphanitic tuff, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm; mostly sand-sized cuttings
390 - 400	118.9 - 121.9	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 60% pink tuff (Tal), 40% white, black and green diabase, gray and green limestone, gray and orange chert, gray and brown quartzite, and vein quartz, trace gray dolomite, trace felsic aphanitic tuff, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm; mostly sand-sized cuttings
400 - 410	121.9 - 125.0	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 60% pink tuff (Tal), 40% white, black and green diabase, gray and green limestone, gray and orange chert, gray and brown quartzite, and vein quartz, trace gray dolomite, trace felsic aphanitic tuff, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm; mostly sand-sized cuttings
410 - 420	125.0 - 128.0	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% white, black and green diabase, gray and green limestone, gray and orange chert, gray and brown quartzite, and vein quartz, trace gray dolomite, trace felsic aphanitic tuff, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	some iron oxide staining	subangular to subrounded chips up to 0.6 cm; mostly sand-sized cuttings

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
420 - 430	128.0 - 131.1	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 80% pink tuff (Tal), 20% black, white and green diabase, red and gray limestone, gray, and brown and orange quartzite, trace light gray aphanitic tuff, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	some iron oxide staining (hematite and limonite), calcite	subangular to subrounded chips up to 1.5 cm; mostly sand-sized cuttings
430 - 440	131.1 - 134.1	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 80% pink tuff (Tal), 20% black, white and green diabase, red and gray limestone, gray and brown oolitic limestone, gray, and brown and orange quartzite, trace light gray aphanitic tuff, trace matrix chips of pinkish-brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	some iron oxide staining (hematite and limonite), calcite	subangular to subrounded chips up to 1.7 cm
440 - 450	134.1 - 137.2	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 50% pink tuff (Tal), 20% black and green diabase, 25% white, pink and orange quartzite, 5% gray and red limestone, gray chert, light gray and brown banded aphanitic tuff, and white vein quartz; overall sample is trace fines; reaction to acid: moderate	common iron oxide staining (hematite)	subangular to subrounded chips up to 1.1 cm
450 - 460	137.2 - 140.2	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 80% pink tuff (Tal), 20% black, white and green diabase, gray and pink limestone (some oolitic), white, orange, pink and brown quartzite, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: moderate	some iron oxide staining (hematite and limonite), calcite	subangular to subrounded chips up to 1.0 cm
460 - 470	140.2 - 143.3	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 20% orange and gray chert, black and green diabase, orange and brown quartzite and grayish-brown limestone, 10% white and clear vein quartz, trace matrix chips of pinkish-brown sandstone; overall sample is trace fines; reaction to acid: moderate	common iron oxide staining, iron staining and calcite on 1 matrix chip	subangular to subrounded chips up to 0.5 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
470 - 480	143.3 - 146.3	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 60% pink tuff (Tal), 30% orange and gray chert, black and green diabase, orange and brown quartzite and grayish-brown limestone, 10% white and clear vein quartz; overall sample is trace fines; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
480 - 490	146.3 - 149.4	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 60% pink tuff (Tal), 40% black, green and white diabase, orange, pink and gray quartzite, gray, pink and orange limestone (trace brecciated), light gray and brown banded tuff, and gray and orange chert; overall sample is trace fines; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
490 - 500	149.4 - 152.4	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 60% pink tuff (Tal), 40% black, green and white diabase, orange, pink and gray quartzite, gray, pink and orange limestone (trace brecciated), light gray and brown banded tuff, and gray and orange chert; overall sample is trace fines; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
500 - 510	152.4 - 155.4	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 60% pink tuff (Tal), 40% black, green and white diabase, orange, pink, yellow and gray quartzite, gray, pink and orange limestone (trace brecciated), light gray and brown banded tuff, and gray and orange chert; overall sample is 5% fines; reaction to acid: very weak	some iron oxide staining	subangular to subrounded chips up to 0.6 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
510 - 520	155.4 - 158.5	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 60% pink tuff (Tal), 40% black, green and white diabase, orange, pink, yellow and gray quartzite, gray, pink and orange limestone (trace brecciated), light gray and brown banded tuff, and gray and orange chert; overall sample is trace fines; reaction to acid: weak	common iron oxide staining	subangular to subrounded chips up to 1.0 cm
520 - 530	158.5 - 161.5	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 90% pink tuff (Tal), 10% black, green and white diabase, orange, pink, yellow and gray quartzite, gray, pink and orange limestone (trace brecciated), light gray and brown banded tuff, and gray and orange chert; overall sample is trace fines; reaction to acid: very weak	some iron oxide staining	subangular to subrounded chips up to 0.6 cm
530 - 540	161.5 - 164.6	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% black, green and white diabase, orange, pink, yellow and gray quartzite, gray, pink and orange limestone (trace brecciated), light gray and brown banded tuff, and gray and orange chert; overall sample is trace fines; reaction to acid: very weak	some iron oxide staining	subangular to subrounded chips up to 0.6 cm
540 - 550	164.6 - 167.6	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% black, green and white diabase, orange, pink, yellow and gray quartzite, gray, pink and orange limestone (trace brecciated), light gray and brown banded tuff, and gray and orange chert; overall sample is trace fines; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
550 - 560	167.6 - 170.7	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 50% pink tuff (Tal), 50% black, green and white diabase, orange, pink, yellow and gray quartzite, gray, pink and orange limestone (trace brecciated), light gray and brown banded tuff, and gray and orange chert; overall sample is trace fines; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm
560 - 570	170.7 - 173.7	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 50% pink tuff (Tal), 50% black, green and white diabase, black basalt, orange and gray chert and vein quartz, yellow, gray, brown and pink quartzite, gray limestone, and light gray and brown banded tuff with trace hornblende; overall sample is trace fines; reaction to acid: weak	some iron oxide staining	subangular to subrounded chips up to 0.7 cm
570 - 580	173.7 - 176.8	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% black, green and white diabase, black basalt, orange and gray chert and vein quartz, yellow, gray, brown and pink quartzite, gray limestone, and light gray and brown banded tuff with trace hornblende; overall sample is trace fines; reaction to acid: weak	some iron oxide staining	subangular to subrounded chips up to 0.3 cm
580 - 590	176.8 - 179.8	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 85% pink tuff (Tal), 15% black, green and white diabase, black basalt, orange and gray chert and vein quartz, yellow, gray, brown and pink quartzite, gray limestone, and light gray and brown banded tuff with trace hornblende; overall sample is trace fines; reaction to acid: very weak	some iron oxide staining	subangular to subrounded chips up to 0.7 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
590 - 600	179.8 - 182.9	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 80% pink tuff (Tal), 20% black, green and white diabase, black basalt, orange and gray chert and vein quartz, yellow, gray, brown and pink quartzite, gray limestone, and light gray and brown banded tuff with trace hornblende; overall sample is trace fines; reaction to acid: weak	some iron oxide staining	subangular to subrounded chips up to 0.7 cm
600 - 610	182.9 - 185.9	Tal-rich conlgomerate; reddish brown [2.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 80% pink tuff (Tal), 20% black, green and white diabase, black basalt, orange and gray chert and vein quartz, yellow, gray, brown and pink quartzite, gray limestone, and light gray and brown banded tuff with trace hornblende; overall sample is trace fines; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.5 cm
610 - 620	185.9 - 189.0	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% black, green and white diabase, black basalt, orange and gray chert and vein quartz, yellow, gray, brown and pink quartzite, gray limestone, and light gray and brown banded tuff with trace hornblende; overall sample is trace fines; reaction to acid: very weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
620 - 630	189.0 - 192.0	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 60% black, green and white diabase, black basalt, orange and gray chert and vein quartz, yellow, gray, brown and pink quartzite, gray limestone, and light gray and brown banded tuff with trace hornblende, 40% pink tuff (Tal); overall sample is trace fines; reaction to acid: very weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
630 - 640	192.0 - 195.1	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% black, green and white diabase, black basalt, orange and gray chert and vein quartz, yellow, gray, brown and pink quartzite, gray limestone, and light gray and brown banded tuff with trace hornblende; overall sample is 2% fines; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.1 cm
640 - 650	195.1 - 198.1	Tal-rich conlgomerate; reddish brown [2.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 80% pink tuff (Tal), 20% black, green and white diabase, black basalt, orange and gray chert and vein quartz, yellow, gray, brown and pink quartzite, gray limestone, and light gray and brown banded tuff with trace hornblende; overall sample is 2% fines; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
650 - 660	198.1 - 201.2	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% black, white and green diabase, gray, brown and yellow limestone, orange and gray quartzite, clear and red vein quartz, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm
660 - 670	201.2 - 204.2	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 55% pink tuff (Tal), 45% black, white and green diabase, gray, brown and yellow limestone, orange and gray quartzite, clear and red vein quartz, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
670 - 680	204.2 - 207.3	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 55% pink tuff (Tal), 45% black, white and green diabase, gray, brown and yellow limestone, orange and gray quartzite, clear and red vein quartz, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
680 - 690	207.3 - 210.3	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 55% pink tuff (Tal), 45% black, white and green diabase, gray, brown and yellow limestone, orange and gray quartzite, clear and red vein quartz, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
690 - 700	210.3 - 213.4	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 60% black, white and green diabase, gray, brown and yellow limestone, orange and gray quartzite, clear and red vein quartz, and light gray and brown banded tuff, 40% pink tuff (Tal); overall sample is trace fines; reaction to acid: weak	some iron oxide staining (hematite and limonite), trace gypsum	subangular to subrounded chips up to 1.2 cm
700 - 710	213.4 - 216.4	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 55% pink tuff (Tal), 45% black, white and green diabase, beige, green, orange and brown quartzite, gray, brown and pink limestone, gray chert, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
710 - 720	216.4 - 219.5	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 90% pink tuff (Tal), 10% black, white and green diabase, beige, green, orange and brown quartzite, gray, brown and pink limestone, gray chert, and light gray and brown banded tuff, trace schist; overall sample is trace fines; reaction to acid: moderate	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm
720 - 730	219.5 - 222.5	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% black, white and green diabase, beige, green, orange and brown quartzite, gray, brown and pink limestone, gray and orange chert, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
730 - 740	222.5 - 225.6	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 98% pink tuff (Tal), 2% black, white and green diabase, beige, green, orange and brown quartzite, gray, brown and pink limestone, gray and orange chert, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 0.6 cm
740 - 750	225.6 - 228.6	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% black, white and green diabase, beige, green, orange and brown quartzite, gray, brown and pink limestone, gray and orange chert, white and orange vein quartz, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 0.7 cm
750 - 760	228.6 - 231.6	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 90% pink tuff (Tal), 10% black, white and green diabase, beige, green, orange and brown quartzite, gray, brown and pink limestone, gray and orange chert, white and orange vein quartz, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
760 - 770	231.6 - 234.7	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 80% pink tuff (Tal), 20% black, white and green diabase, beige, green, orange and brown quartzite, gray, brown and pink limestone (trace oolitic and with small invertebrate fossils), gray and orange chert, white and orange vein quartz, and light gray and brown banded tuff; overall sample is trace fines; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
770 - 780	234.7 - 237.7	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% black, white and green diabase, peach and brown quartzite, light gray and brown banded tuff, grayish-brown chert, and clear and milky vein quartz; overall sample is trace fines; reaction to acid: moderate	some iron oxide staining (hematite and limonite), trace gypsum	subangular to subrounded chips up to 1.0 cm
780 - 790	237.7 - 240.8	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% black, white and green diabase, peach and brown quartzite, light gray and brown banded tuff, grayish-brown chert, and clear and milky vein quartz; overall sample is trace fines; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
790 - 800	240.8 - 243.8	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 60% pink tuff (Tal), 40% black, white and green diabase, peach and brown quartzite, limestone, light gray and brown banded tuff, grayish-brown chert, and clear and milky vein quartz; overall sample is trace fines; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
800 - 810	243.8 - 246.9	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 85% pink tuff (Tal), 15% black, white and green diabase, peach and brown quartzite, limestone, light gray and brown banded tuff, grayish-brown chert, and clear and milky vein quartz; overall sample is trace fines; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
810 - 820	246.9 - 249.9	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% black, white and green diabase, peach and brown quartzite, limestone, light gray and brown banded tuff, grayish-brown chert, and clear and milky vein quartz; overall sample is trace fines; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.8 cm; Tal abundant in gravel fraction too

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
820 - 830	249.9 - 253.0	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% black, white and green diabase, peach and brown quartzite, limestone (trace fossiliferous), light gray and brown banded tuff, grayish-brown chert, black siliceous mudstone, and clear and milky vein quartz; overall sample is trace fines; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.8 cm
830 - 840	253.0 - 256.0	Tal-rich conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 30% black, white and green diabase, peach and brown quartzite, limestone (trace fossiliferous), light gray and brown banded tuff, grayish-brown chert, black siliceous mudstone, and clear and milky vein quartz, trace matrix chips of pinkish-brown silty sandstone; overall sample is 10% fines; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm; Tal is mostly sand-sized
840 - 850	256.0 - 259.1	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal) (boulder?), trace quartzite, diabase, limestone, and grayish-red chert, trace matrix chips of pinkish-brown silty sandstone; overall sample is 20% fines; reaction to acid: strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.5 cm; Tal is mostly sand-sized
850 - 860	259.1 - 262.1	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal) (boulder?), trace quartzite, diabase, limestone, and grayish-red chert, trace matrix chips of pinkish-brown silty sandstone; overall sample is 20% fines; reaction to acid: weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
860 - 870	262.1 - 265.2	Tal-rich conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal) (boulder?), trace quartzite, diabase, limestone, and grayish-red chert, trace matrix chips of pinkish-brown silty sandstone; overall sample is 20% fines; reaction to acid: weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
870 - 880	265.2 - 268.2	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 90% pink tuff (Tal), 10% black and green diabase, grayish-brown limestone, pink and gray chert, and orangish-gray and yellow quartzite, trace light gray banded tuff; overall sample is 10% fines; reaction to acid: moderate	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
880 - 890	268.2 - 271.3	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace grayish-brown limestone, black and green diabase, and orangish-brown quartzite; overall sample is 10% fines; reaction to acid: moderate	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
890 - 900	271.3 - 274.3	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace grayish-brown limestone, black and green diabase, and orangish-brown quartzite; overall sample is 12% fines; reaction to acid: weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
900 - 910	274.3 - 277.4	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace grayish-brown limestone, black and green diabase, and orangish-brown quartzite; overall sample is 2% fines; reaction to acid: very weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm; larger tuff chips
910 - 920	277.4 - 280.4	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace grayish-brown limestone, black and green diabase, and orangish-brown quartzite; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
920 - 930	280.4 - 283.5	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace grayish-brown limestone, black and green diabase, and orangish-brown quartzite; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.4 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
930 - 940	283.5 - 286.5	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace grayish-brown limestone, black and green diabase, and orangish-brown quartzite; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
940 - 950	286.5 - 289.6	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace grayish-brown limestone, black and green diabase, and orangish-brown quartzite; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm
950 - 960	289.6 - 292.6	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% gray, pink and brown limestone, black diabase, and orange and brown quartzite; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
960 - 970	292.6 - 295.7	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace diabase, quartzite and limestone; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
970 - 980	295.7 - 298.7	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace diabase, quartzite, limestone, and orange chert; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
980 - 990	298.7 - 301.8	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace gray and pink limestone, and brown quartzite; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
990 - 1,000	301.8 - 304.8	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace gray and pink limestone, and brown quartzite; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,000 - 1,010	304.8 - 307.8	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 95% pink and orange tuff (Tal), 5% gray and pink limestone, light gray banded tuff, brown quartzite, and black and green diabase; overall sample is trace fines; reaction to acid: very weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
1,010 - 1,020	307.8 - 310.9	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite and gray limestone; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.9 cm
1,020 - 1,030	310.9 - 313.9	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite, gray limestone, and black basalt; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.9 cm
1,030 - 1,040	313.9 - 317.0	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite, gray limestone, and black basalt; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.9 cm
1,040 - 1,050	317.0 - 320.0	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite, gray limestone, and black basalt; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 0.9 cm
1,050 - 1,060	320.0 - 323.1	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite, gray limestone, and black basalt; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 0.9 cm
1,060 - 1,070	323.1 - 326.1	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite, gray limestone, and black basalt; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.9 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,070 - 1,080	326.1 - 329.2	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite, gray limestone, and black basalt; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 1.1 cm
1,080 - 1,090	329.2 - 332.2	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite, gray limestone, and black basalt; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.5 cm
1,090 - 1,100	332.2 - 335.3	Tal-rich conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite, gray limestone, and black basalt; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 0.5 cm
1,100 - 1,110	335.3 - 338.3	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite, gray limestone, and black basalt; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 0.5 cm
1,110 - 1,120	338.3 - 341.4	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace brown quartzite, gray limestone, and black basalt; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 0.9 cm
1,120 - 1,130	341.4 - 344.4	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 85% pink tuff (Tal), 15% pale orange chert, white quartz, and brown and gray limestone, trace brown quartzite; overall sample is trace fines; reaction to acid: moderate	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.0 cm
1,130 - 1,140	344.4 - 347.5	Tal-rich conlgomerate; pale red [2.5YR6/2]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 50% pink tuff (Tal), 50% pale orange chert, white quartz, and brown and gray limestone, trace brown quartzite; overall sample is trace fines; reaction to acid: strong	some iron oxide staining	subangular to subrounded chips up to 1.1 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,140 - 1,150	347.5 - 350.5	Tal-rich conlgomerate; pale red [2.5YR6/2]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pinkish-brown tuff (Tal), trace red chert and black and green diabase; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 0.5 cm
1,150 - 1,160	350.5 - 353.6	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pinkish-brown tuff (Tal), trace red chert and black and green diabase; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.6 cm
1,160 - 1,170	353.6 - 356.6	Tal-rich conlgomerate; light reddish brown [2.5YR6/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 98% pinkish-brown tuff (Tal), 2% gray and pink limestone, brown quartzite, and black basalt; overall sample is trace fines; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,170 - 1,180	356.6 - 359.7	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pinkish-brown tuff (Tal), trace gray limestone and brown quartzite; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,180 - 1,190	359.7 - 362.7	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pinkish-brown tuff (Tal), trace gray and orange limestone, red chert, and brown quartzite; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 1.5 cm
1,190 - 1,200	362.7 - 365.8	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 98% pinkish-brown tuff (Tal), 2% gray and pink limestone, red and brown quartzite, and black basalt; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 1.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,200 - 1,210	365.8 - 368.8	Tal-rich conlgomerate; light reddish brown [2.5YR6/2]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% black basalt with calcite amygdules, gray limestone, black and green diabase, brown quartzite, orange chert, and vein quartz; overall sample is trace fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.8 cm
1,210 - 1,220	368.8 - 371.9	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% black basalt with calcite amygdules, gray limestone, black and green diabase, brown quartzite, orange chert, and vein quartz, trace green serpentine; overall sample is 5% fines; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 1.2 cm
1,220 - 1,230	371.9 - 374.9	Tal-rich conlgomerate; light reddish brown [2.5YR7/3]; moderately lithified; silty gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% black basalt with calcite amygdules, black and green diabase, brown and green quartzite, orange chert, and vein quartz, trace green serpentine, trace matrix chips of pinkish-brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,230 - 1,240	374.9 - 378.0	Tal-rich conlgomerate; pale red [2.5YR7/2]; moderately lithified; gravelly silty sand; cut chips are clasts of 90% pink tuff (Tal), 5% black basalt with calcite amygdules, black and green diabase, brown and green quartzite, orange chert, and vein quartz, trace green serpentine, and 5% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 29% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,240 - 1,250	378.0 - 381.0	Tal-rich conlgomerate; pale red [2.5YR7/2]; moderately lithified; gravelly silty sand; cut chips are clasts of 90% pink tuff (Tal), 5% black basalt with calcite amygdules, black and green diabase, brown and green quartzite, orange chert, and vein quartz, trace green serpentine, and 5% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,250 - 1,260	381.0 - 384.0	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 95% pink tuff (Tal), trace green quartzite and black basalt, and 5% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 19% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,260 - 1,270	384.0 - 387.1	Tal-rich conlgomerate; reddish brown [2.5YR5/3]; moderately lithified; gravelly sand; cut chips are clasts of 95% pinkish-brown tuff (Tal), trace black basalt and brown, green and gray quartzite, 5% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.0 cm
1,270 - 1,280	387.1 - 390.1	Tal-rich conlgomerate; pale red [2.5YR6/2]; moderately lithified; gravelly silty sand; cut chips are clasts of 60% pinkish-brown tuff (Tal), trace black basalt and brown, green and gray quartzite, 40% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 43% fines and matrix chips; reaction to acid: weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.0 cm
1,280 - 1,290	390.1 - 393.2	Tal-rich conlgomerate; pale red [2.5YR6/2]; moderately lithified; gravelly sand; cut chips are clasts of 90% pinkish-brown tuff (Tal), trace black basalt and brown, green and gray quartzite, 10% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.0 cm
1,290 - 1,300	393.2 - 396.2	Tal-rich conlgomerate; pale red [2.5YR6/2]; moderately lithified; gravelly sand; cut chips are clasts of 80% pinkish-brown tuff (Tal), trace black basalt and brown, green and gray quartzite, 20% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 24% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.0 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,300 - 1,310	396.2 - 399.3	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly sand; cut chips are clasts of 80% pinkish-brown tuff (Tal), trace black basalt and brown, green and gray quartzite, 20% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 24% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.0 cm
1,310 - 1,320	399.3 - 402.3	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 80% pinkish-brown tuff (Tal), trace black basalt and brown, green and gray quartzite, 20% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 24% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.0 cm
1,320 - 1,330	402.3 - 405.4	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly sand; cut chips are clasts of 95% pinkish-brown tuff (Tal), trace black basalt and brown, green and gray quartzite, 5% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.0 cm
1,330 - 1,340	405.4 - 408.4	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly sand; cut chips are clasts of 90% pinkish-brown tuff (Tal), trace black basalt and brown, green and gray quartzite, 10% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.1 cm
1,340 - 1,350	408.4 - 411.5	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 60% pinkish-brown tuff (Tal), 30% black and green diabase, brown quartzite, orange chert, grayish-brown limestone, and vein quartz, and 10% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 19% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,350 - 1,360	411.5 - 414.5	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 70% pinkish-brown tuff (Tal), 20% black and green diabase, brown quartzite, orange chert, grayish-brown limestone, and vein quartz, and 10% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 23% fines and matrix chips; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,360 - 1,370	414.5 - 417.6	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 70% pinkish-brown tuff (Tal), 20% black and green diabase, brown quartzite, orange chert, grayish-brown limestone, and vein quartz, and 10% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 23% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,370 - 1,380	417.6 - 420.6	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 75% pinkish-brown tuff (Tal), 10% black and green diabase, brown quartzite, orange chert, grayish-brown limestone, and vein quartz, and 15% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 28% fines and matrix chips; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,380 - 1,390	420.6 - 423.7	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 75% pinkish-brown tuff (Tal), 5% black and green diabase, brown quartzite, orange chert, grayish-brown limestone, and vein quartz, and 20% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 32% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.6 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,390 - 1,400	423.7 - 426.7	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 75% pinkish-brown tuff (Tal), 5% black and green diabase, brown quartzite, orange chert, grayish-brown limestone, and vein quartz, and 20% fines and matrix chips of pinkish-brown silty sandstone; overall sample is 44% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,400 - 1,410	426.7 - 429.8	Tal-rich conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 45% pinkish-brown tuff (Tal), 15% red, orange and gray chert, gray and pink limestone, white, brown and red quartzite, and black and green diabase, 40% matrix chips of brown silty sandstone; overall sample is 55% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,410 - 1,420	429.8 - 432.8	Tal-rich conlgomerate; pinkish gray [7.5YR7/2]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% pinkish-brown tuff (Tal), 15% red, orange and gray chert, gray and pink limestone, white, brown and red quartzite, and black and green diabase, 55% matrix chips of brown silty sandstone; overall sample is 57% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.1 cm
1,420 - 1,430	432.8 - 435.9	Tal-rich conlgomerate; pink [7.5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 40% pinkish-brown tuff (Tal), 5% red, orange and gray chert, gray and pink limestone, white, brown and red quartzite, and black and green diabase, 55% matrix chips of brown silty sandstone; overall sample is 57% fines and matrix chips; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 1.1 cm
1,430 - 1,440	435.9 - 438.9	Tal-rich conlgomerate; pink [7.5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 43% pinkish-brown tuff (Tal), 2% red, orange and gray chert, gray and pink limestone, white, brown and red quartzite, and black and green diabase, 55% matrix chips of brown silty sandstone; overall sample is 57% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.1 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,440 - 1,450	438.9 - 442.0	Tal-rich conlgomerate; pink [7.5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% pinkish-brown tuff (Tal), trace gray limestone, brown quartzite, black and green diabase, and orange chert, and 70% matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 1.2 cm
1,450 - 1,460	442.0 - 445.0	Tal-rich conlgomerate; pink [7.5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 15% pinkish-brown tuff (Tal), 5% gray limestone, brown quartzite, black and green diabase, and orange chert, and 80% matrix chips of brown silty sandstone; overall sample is 81% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.7 cm
1,460 - 1,470	445.0 - 448.1	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 40% pinkish-brown tuff (Tal), 30% gray, brown, orange and red limestone, black basalt, orange chert, and brown quartzite, and 30% matrix chips of brown silty sandstone; overall sample is 33% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,470 - 1,480	448.1 - 451.1	Tal-rich conlgomerate; light reddish brown [2.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 35% pinkish-brown tuff (Tal), 5% mostly orange chert and brown quartzite, very little limestone, and 60% matrix chips of brown silty sandstone; overall sample is 70% fines and matrix chips; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,480 - 1,490	451.1 - 454.2	Tal-rich conlgomerate; light reddish brown [2.5YR6/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 50% pinkish-brown tuff (Tal), 10% mostly orange chert and brown quartzite, very little limestone, and 40% matrix chips of brown silty sandstone; overall sample is 49% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

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GILA CONGLOMERATE- Tal-rich (QTg)				
1,490 - 1,500	454.2 - 457.2	Tal-rich conlgomerate; light reddish brown [2.5YR6/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 50% pinkish-brown tuff (Tal), 15% mostly orange chert and brown quartzite, very little limestone, and 35% matrix chips of brown silty sandstone; overall sample is 54% fines and matrix chips; reaction to acid: weak to moderate	trace iron oxide staining	subangular to subrounded chips up to 0.4 cm
1,500 - 1,510	457.2 - 460.2	Tal-rich conlgomerate; pink [5YR7/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% pinkish-brown tuff (Tal), 15% mostly orange chert and brown quartzite, very little limestone, and 55% matrix chips of brown silty sandstone; overall sample is 57% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.7 cm
1,510 - 1,520	460.2 - 463.3	Tal-rich conlgomerate; pink [5YR7/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 50% pinkish-brown tuff (Tal), 20% mostly orange chert and brown quartzite, very little limestone, and 30% matrix chips of brown silty sandstone; overall sample is 33% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.2 cm
1,520 - 1,530	463.3 - 466.3	Tal-rich conlgomerate; light reddish brown [2.5YR6/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% pinkish-brown tuff (Tal), 20% mostly orange chert and brown quartzite, very little limestone, and 60% matrix chips of brown silty sandstone; overall sample is 62% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 0.7 cm
1,530 - 1,540	466.3 - 469.4	Tal-rich conlgomerate; pink [5YR7/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% pinkish-brown tuff (Tal), 20% mostly orange chert and brown quartzite, very little limestone, and 60% matrix chips of brown silty sandstone; overall sample is 64% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 0.7 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,540 - 1,550	469.4 - 472.4	Tal-rich conlgomerate; light reddish brown [5YR6/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% pinkish-brown tuff (Tal), 20% orange chert, gray, white and pink limestone, brown, red and black diabase, and black basalt, and 60% matrix chips of pinkish-brown silty sandstone; overall sample is 62% fines and matrix chips; reaction to acid: moderate to strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
1,550 - 1,560	472.4 - 475.5	Tal-rich conlgomerate; light reddish brown [5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% pinkish-brown tuff (Tal), 20% orange chert, gray, white and pink limestone, brown, red and black diabase, and black basalt, trace vein quartz, and 60% matrix chips of pinkish-brown silty sandstone; overall sample is 62% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
1,560 - 1,570	475.5 - 478.5	Tal-rich conlgomerate; light reddish brown [5YR6/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% pinkish-brown tuff (Tal), 30% orange chert, gray, white and pink limestone, brown, red and black diabase, and black basalt, trace vein quartz, and 40% matrix chips of pinkish-brown silty sandstone; overall sample is 43% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite), trace manganese oxide on quartzite fragments	subangular to subrounded chips up to 0.8 cm
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,570 - 1,580	478.5 - 481.6	Matrix-supported conglomerate; light reddish brown [5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 65% black basalt with iron oxide in vesicles, gray and pink limestone, orange chert, brown quartzite, and milky vein quartz, 15% pinkish-brown tuff (Tal), and 20% matrix chips of pinkish-brown silty sandstone; overall sample is 24% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,580 - 1,590	481.6 - 484.6	Matrix-supported conglomerate; light reddish brown [5YR6/3]; moderately lithified; gravelly sand; cut chips are clasts of 50% pinkish-brown tuff (Tal), 40% black basalt with iron oxide in vesicles, gray and pink limestone, orange chert, brown quartzite, and milky vein quartz, and 10% matrix chips of pinkish-brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
1,590 - 1,600	484.6 - 487.7	Matrix-supported conglomerate; light reddish brown [5YR6/4]; moderately lithified; gravelly sand; cut chips are clasts of 85% gray, brown and orange limestone, red chert, black basalt, and brown quartzite, 10% pinkish-brown tuff (Tal), and 5% matrix chips of pinkish-brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
1,600 - 1,610	487.7 - 490.7	Matrix-supported conglomerate; pink [5YR7/4]; moderately lithified; gravelly sand; cut chips are clasts of gray, brown and red limestone, orangish-brown chert, orange and dark brown quartzite, black basalt, white vein quartz, and pink tuff (Tal), trace matrix chips of pinkish-brown silty sandstone; overall sample is 5% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
1,610 - 1,620	490.7 - 493.8	Matrix-supported conglomerate; pink [5YR7/4]; moderately lithified; gravelly sand; cut chips are clasts of gray, brown and red limestone, orangish-brown chert, orange and dark brown quartzite, black basalt, white vein quartz, and pink tuff (Tal), trace matrix chips of pinkish-brown silty sandstone; overall sample is 10% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
1,620 - 1,630	493.8 - 496.8	Matrix-supported conglomerate; pink [5YR7/4]; moderately lithified; gravelly sand; cut chips are clasts of gray, brown and red limestone, orangish-brown chert, orange and dark brown quartzite, black basalt, white vein quartz, and pink tuff (Tal), trace matrix chips of pinkish-brown silty sandstone; overall sample is 5% fines; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,630 - 1,640	496.8 - 499.9	Matrix-supported conglomerate; pink [5YR7/4]; moderately lithified; gravelly sand; cut chips are clasts of gray, brown and red limestone, orangish-brown chert, orange and dark brown quartzite, black basalt, white vein quartz, and pink tuff (Tal), and trace matrix chips of pinkish-brown silty sandstone; overall sample is 5% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace manganese oxide	subangular to subrounded chips up to 1.0 cm
1,640 - 1,650	499.9 - 502.9	Matrix-supported conglomerate; reddish yellow [2.5YR7/6]; moderately lithified; gravelly sand; cut chips are clasts of 80% gray, brown and red limestone, orangish-brown chert, orange and dark brown quartzite, black basalt, and white vein quartz, 20% pink tuff (Tal), and trace matrix chips of pinkish-brown silty sandstone; overall sample is 5% fines; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
1,650 - 1,660	502.9 - 506.0	Matrix-supported conglomerate; NO SAMPLE		
1,660 - 1,670	506.0 - 509.0	Matrix-supported conglomerate; light reddish brown [5YR6/4]; moderately lithified; gravelly sand; cut chips are clasts of 75% orange and gray limestone, brown quartzite, red chert, black basalt, black and green diabase, and white vein quartz, 20% pinkish-brown tuff (Tal), and 5% matrix chips of pinkish-brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace manganese oxide	subangular to subrounded chips up to 1.0 cm
1,670 - 1,680	509.0 - 512.1	Matrix-supported conglomerate; light reddish brown [5YR6/4]; moderately lithified; gravelly sand; cut chips are clasts of 50% black basalt with iron oxide in vesicles and some magnetite, 40% brown quartzite, gray limestone, light gray tuff, and red chert, 5% pinkish-brown tuff (Tal), and 5% matrix chips of pinkish-brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,680 - 1,690	512.1 - 515.1	Matrix-supported conglomerate; light reddish brown [5YR6/4]; moderately lithified; gravelly sand; cut chips are clasts of 65% gray and brown limestone, orange chert, black basalt, and brown quartzite, 5% pink tuff (Tal), and 30% matrix chips of pinkish-brown silty sandstone; overall sample is 33% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
1,690 - 1,700	515.1 - 518.2	Matrix-supported conglomerate; light reddish brown [5YR6/4]; moderately lithified; gravelly sand; cut chips are 95% clasts of gray, brown, green and orange limestone, brown and orange quartzite, orange chert, black basalt, and pink tuff (Tal), and 5% matrix chips of pinkish-brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
1,700 - 1,710	518.2 - 521.2	Matrix-supported conglomerate; light reddish brown [5YR6/4]; moderately lithified; gravelly silty sand; cut chips are 90% clasts of gray, brown, green and orange limestone, brown and orange quartzite, orange chert, black basalt, tan tuff, red scoria with calcite amygdules, and pink tuff (Tal), trace magnetite, and 10% matrix chips of pinkish-brown silty sandstone; overall sample is 23% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
1,710 - 1,720	521.2 - 524.3	Matrix-supported conglomerate; light reddish brown [5YR6/4]; moderately lithified; gravelly silty sand; cut chips are 90% clasts of gray, brown, green and orange limestone, brown and orange quartzite, orange chert, black basalt, tan tuff, red scoria with calcite amygdules, and pink tuff (Tal), trace magnetite, and 10% matrix chips of pinkish-brown silty sandstone; overall sample is 28% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite), trace manganese oxide	subangular to subrounded chips up to 2.3 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,720 - 1,730	524.3 - 527.3	Matrix-supported conglomerate; light reddish brown [5YR6/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 70% gray, brown, green and orange limestone, brown and orange quartzite, orange and red chert, black basalt, tan tuff, and red scoria with calcite amygdules, trace magnetite, 10% pinkish-brown tuff (Tal), and 20% matrix chips of pinkish-brown silty sandstone; overall sample is 32% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
1,730 - 1,740	527.3 - 530.4	Matrix-supported conglomerate; pink [5YR7/4]; well lithified; gravelly silty sand; cut chips are 30% clasts of gray limestone, purplish-brown quartzite, red chert, black basalt, red scoria, and pink tuff (Tal), trace magnetite, and 70% matrix chips of pinkish-brown silty sandstone; overall sample is 70% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
1,740 - 1,750	530.4 - 533.4	Matrix-supported conglomerate; brown [7.5YR5/3]; well lithified; gravelly silty sand; cut chips are 10% clasts of gray limestone, purplish-brown quartzite, red chert, black basalt, red scoria, and pink tuff (Tal), trace magnetite, and 90% matrix chips of pinkish-brown silty sandstone; overall sample is 90% fines and matrix chips; reaction to acid: weak	some iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,750 - 1,760	533.4 - 536.4	Matrix-supported conglomerate; brown [7.5YR5/3]; well lithified; gravelly silty sand; cut chips are 10% clasts of gray limestone, purplish-brown quartzite, red chert, black basalt, red scoria, and pink tuff (Tal), trace magnetite, and 90% matrix chips of pinkish-brown silty sandstone; overall sample is 91% fines and matrix chips; reaction to acid: weak	some iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,760 - 1,770	536.4 - 539.5	Matrix-supported conglomerate; brown [7.5YR5/3]; well lithified; gravelly silty sand; cut chips are 10% clasts of gray limestone, purplish-brown quartzite, red chert, black basalt, red scoria, and pink tuff (Tal), trace magnetite, and 90% matrix chips of pinkish-brown silty sandstone; overall sample is 90% fines and matrix chips; reaction to acid: weak	some iron oxide staining	subangular to subrounded chips up to 1.2 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,770 - 1,780	539.5 - 542.5	Matrix-supported conglomerate; light brown [7.5YR6/3]; well lithified; gravelly silty sand; cut chips are 30% clasts of gray limestone, purplish-brown quartzite, red chert, black basalt, red scoria, and pink tuff (Tal), trace magnetite, 55% matrix chips of pinkish-brown silty sandstone, and 10% yellow felsic aphanitic tuff; overall sample is 55% fines and matrix chips; reaction to acid: very weak	some iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,780 - 1,790	542.5 - 545.6	Tuff; pale yellow [2.5Y7/3]; well lithified; 80% yellow aphanitic tuff with abundant lithic fragments, 20% red scoria, black basalt, gray chert, orange quartzite, and orange quartzite; reaction to acid: very weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 0.5 cm
TERTIARY VOLCANICS- tuff (Tvs)				
1,790 - 1,800	545.6 - 548.6	Tuff; pale yellow [5Y8/3]; well lithified; 90% yellow aphanitic tuff with abundant lithic fragments, 10% red scoria, black basalt, gray chert, orange quartzite, and orange quartzite; reaction to acid: very weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.0 cm
1,800 - 1,810	548.6 - 551.7	Tuff; pale yellow [2.5Y8/2]; well lithified; 90% yellow aphanitic tuff with abundant lithic fragments and phenocrysts of white plagioclase feldspar, 10% red scoria, black basalt, gray chert, orange quartzite, and orange quartzite, trace gray and pink limestone; reaction to acid: very weak	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.1 cm
1,810 - 1,820	551.7 - 554.7	Tuff; pale yellow [2.5Y8/2]; well lithified; 95% yellow tuff with some phenocryst of white plagioclase feldspar and abundant lithic fragments, 5% red scoria, red chert, black basalt, and brown quartzite; reaction to acid: very weak	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.0 cm
1,820 - 1,830	554.7 - 557.8	Tuff and Basalt; pale yellow [2.5Y8/2], very dark gray [10YR3/1], and red [2.5YR5/6]; well lithified; 50% yellow and white felsic aphanitic tuff with abundant lithic fragments, 50% red scoria with calcite amygdules, black basalt, brown quartzite, medium brown tuffaceous sandstone, and red chert; reaction to acid: very weak	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 0.9 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- tuffaceous sandstone (Tvs)				
1,830 - 1,840	557.8 - 560.8	Tuffaceous Sandstone; pink [7.5YR7/3]; well lithified; 93% medium brown tuffaceous sandstone with lithic fragments of red scoria and yellow tuff, 5% red scoria with trace calcite amygdules, trace black basalt, brown quartzite and red chert; reaction to acid: weak to moderate	some iron oxide staining (hematite), 2% clear calcite	subangular to subrounded chips up to 1.0 cm
1,840 - 1,850	560.8 - 563.9	Tuffaceous Sandstone, Scoria, and Basalt; reddish brown [5YR4/3]; well lithified; 35% red scoria, 35% black basalt, 30% medium brown tuffaceous sandstone with tiny lithic fragments; reaction to acid: strong	some iron oxide staining (hematite), some calcite amygdules in scoria and basalt	subangular to subrounded chips up to 1.4 cm
TERTIARY VOLCANICS- basalt (Tvs)				
1,850 - 1,860	563.9 - 566.9	Basalt; reddish brown [5YR4/3]; well lithified; 95% black basalt with white plagioclase and quartz amygdules, trace green olivine, 5% medium brown sandstone and red scoria; reaction to acid: moderate to strong	trace iron oxide speckling, trace calcite	subangular to subrounded chips up to 1.0 cm
1,860 - 1,870	566.9 - 570.0	Basalt; black [7.5YR2.5/1]; well lithified; black basalt with white plagioclase and quartz amygdules, trace green olivine, trace red scoria and medium brown sandstone; reaction to acid: weak to moderate	trace iron oxide speckling, milky vein quartz, euhedral quartz crystals on fracture surface of 3.4 cm chip, trace calcite	subangular to subrounded chips up to 3.4 cm
1,870 - 1,880	570.0 - 573.0	Basalt; black [7.5YR2.5/1]; well lithified; 93% black basalt with white plagioclase and quartz amygdules, trace green olivine, trace red scoria; reaction to acid: strong	trace iron oxide speckling, 5% milky white and pink vein quartz, 2% calcite	subangular to subrounded chips up to 0.7 cm
1,880 - 1,890	573.0 - 576.1	Basalt; black [7.5YR2.5/1]; well lithified; black basalt with white plagioclase and quartz amygdules, trace green olivine, trace red scoria and medium brown sandstone; reaction to acid: weak to moderate	trace iron oxide speckling, trace calcite, green serpentine and white calcite on fracture surfaces, trace slickensides	subangular to subrounded chips up to 1.6 cm
1,890 - 1,900	576.1 - 579.1	Basalt; black [7.5YR2.5/1]; well lithified; black basalt with white plagioclase and quartz amygdules, trace green olivine; reaction to acid: very weak	trace iron oxide speckling, trace calcite, more green serpentine and white calcite on fracture surfaces	subangular to subrounded chips up to 2.0 cm
1,900 - 1,910	579.1 - 582.2	NO SAMPLE LABELLED 1900-1920; DRILLERS REALIZED PIPE TALLY WAS 1 OFF		

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-03
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- basalt (Tvs)				
1,910 - 1,920	582.2 - 585.2	NOT SURE WHERE ACTUAL DATA GAP EXISTS		
1,920 - 1,930	585.2 - 588.3	Basalt; black [7.5YR2.5/1]; well lithified; black basalt with white plagioclase and quartz amygdules; reaction to acid: very weak	trace iron oxide staining speckling, green serpentine and white calcite on fracture surfaces	subangular to subrounded chips up to 2.3 cm
1,930 - 1,940	588.3 - 591.3	Basalt; black [7.5YR2.5/1]; well lithified; black basalt with white plagioclase and quartz amygdules; reaction to acid: very weak	trace iron oxide staining speckling, green serpentine and white calcite on fracture surfaces	subangular to subrounded chips up to 1.0 cm
1,940 - 1,950	591.3 - 594.4	Basalt; black [7.5YR2.5/1] and red [10R4/6]; well lithified; 93% black basalt with white plagioclase and quartz amygdules, 5% red scoria and paleosol of baked sandstone; reaction to acid: strong	some iron oxide staining and speckling, green serpentine and white calcite on fracture surfaces 2% calcite	subangular to subrounded chips up to 1.2 cm
TERTIARY VOLCANICS- paleosol (Tvs)				
1,950 - 1,960	594.4 - 597.4	Paleosol; red [10R4/6]; well lithified; 93% red paleosol of baked sandstone and mudstone with some red scoria clasts, 5% black basalt; reaction to acid: strong	abundant iron oxide staining, 2% calcite, trace green serpentine	subangular to subrounded chips up to 1.1 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
0 - 10	0.0 - 3.0	Matrix-supported conlgomerate; brown [10YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of black basalt, black, white and red diabase, brown and gray quartzite, and light gray and brown banded tuff; overall sample is 30% fines; reaction to acid: weak to moderate	trace iron oxide staining	CONVENTIONAL AIR ROTARY; Munsell Color Version: 2000 revised edition; subangular to subrounded chips up to 1.9 cm; mostly sand-sized cuttings
10 - 20	3.0 - 6.1	Matrix-supported conlgomerate; brown [10YR5/3]; moderately lithified; gravelly silty sand; cut chips are 60% clasts of black basalt, black and white diabase, orange limestone, pink tuff with aphanitic groundmass and phenocrysts of feldspar, quartz and biotite (Tal), and gray, brown and red quartzite, and 40% matrix chips of brown silty sandstone; overall sample is 49% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 2.0 cm
20 - 30	6.1 - 9.1	Matrix-supported conlgomerate; brown [10YR5/3]; moderately lithified; gravelly silty sand; cut chips are 60% clasts of black basalt, black and white diabase, orange limestone, pink tuff with aphanitic groundmass and phenocrysts of feldspar, quartz and biotite (Tal), dark gray dolomite, and gray, brown and red quartzite, and 40% matrix chips of brown silty sandstone; overall sample is 43% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 3.8 cm
30 - 40	9.1 - 12.2	Matrix-supported conlgomerate; brown [10YR5/3]; moderately lithified; gravelly silty sand; cut chips are 60% clasts of black basalt, black and white diabase, orange limestone, pink tuff with aphanitic groundmass and phenocrysts of feldspar, quartz and biotite (Tal), gray chert, and gray, brown and red quartzite, and 40% matrix chips of brown silty sandstone; overall sample is 43% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 1.9 cm; mostly sand-sized cuttings
40 - 50	12.2 - 15.2	Matrix-supported conlgomerate; brown [10YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of black basalt, black and white diabase, orange limestone, pink tuff with aphanitic groundmass and phenocrysts of feldspar, quartz and biotite (Tal), gray chert, and gray, brown and red quartzite, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace calcite	CONVENTIONAL MUD ROTARY; subangular to subrounded chips up to 0.2 cm; mostly sand-sized cuttings

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
50 - 60	15.2 - 18.3	Matrix-supported conlgomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of black basalt, black and white diabase, orange limestone, pink tuff with aphanitic groundmass and phenocrysts of feldspar, quartz and biotite (Tal), gray chert, and gray, brown and red quartzite, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 0.2 cm; mostly sand-sized cuttings
60 - 70	18.3 - 21.3	Matrix-supported conlgomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are 85% clasts of black basalt, black and white diabase, orange limestone, pink tuff with aphanitic groundmass and phenocrysts of feldspar, quartz and biotite (Tal), gray chert, and gray, brown and red quartzite, and 15% matrix chips of brown silty sandstone; overall sample is 19% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 0.2 cm; mostly sand-sized cuttings
70 - 80	21.3 - 24.4	Matrix-supported conlgomerate; brown [10YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of black basalt, black and white diabase, orange limestone, pink tuff with aphanitic groundmass and phenocrysts of feldspar, quartz and biotite (Tal), gray chert, and gray, brown and red quartzite, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 0.2 cm; mostly sand-sized cuttings
80 - 90	24.4 - 27.4	Matrix-supported conlgomerate; brown [7.5YR5/3]; moderately lithified; gravelly silty sand; cut chips are 45% clasts of gray, brown and red quartzite, black basalt, black and white diabase, gray limestone, pink tuff (Tal), and light gray and brown banded tuff, and 55% matrix chips of brown silty sandstone; overall sample is 56% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 2.5 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
90 - 100	27.4 - 30.5	Matrix-supported conlgomerate; brown [7.5YR5/3]; moderately lithified; gravelly silty sand; cut chips are 45% clasts of gray, brown and red quartzite, black basalt, black and white diabase, gray limestone, pink tuff (Tal), and light gray and brown banded tuff, and 55% matrix chips of brown silty sandstone; overall sample is 56% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 2.0 cm
100 - 110	30.5 - 33.5	Matrix-supported conlgomerate; light brown [7.5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are 45% clasts of gray, brown and red quartzite, black basalt, black and white diabase, gray limestone, pink tuff (Tal), and light gray and brown banded tuff, and 55% matrix chips of brown silty sandstone; overall sample is 57% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.8 cm
110 - 120	33.5 - 36.6	Matrix-supported conlgomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are 45% clasts of gray, brown and red quartzite, black basalt, black and white diabase, gray limestone, pink tuff (Tal), and light gray and brown banded tuff, and 55% matrix chips of brown silty sandstone; overall sample is 57% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 2.1 cm
120 - 130	36.6 - 39.6	Matrix-supported conlgomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are 45% clasts of gray, brown and red quartzite, black basalt, black and white diabase, gray limestone, pink tuff (Tal), and light gray and brown banded tuff, and 55% matrix chips of brown silty sandstone; overall sample is 56% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace manganese oxide	subangular to subrounded chips up to 1.7 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
130 - 140	39.6 - 42.7	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are 45% clasts of gray, brown and red quartzite, black basalt, black, white and green diabase, gray limestone, pink tuff (Tal), and light gray and brown banded tuff, and 55% matrix chips of brown silty sandstone; overall sample is 59% fines and matrix chips; reaction to acid: weak to moderate	some iron oxide staining	subangular to subrounded chips up to 1.7 cm
140 - 150	42.7 - 45.7	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black, white, green and red diabase, green, white, gray, orange and brown quartzite, gray and brown limestone, black basalt, pink tuff (Tal), and light gray and brown banded tuff, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: moderate to strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm
150 - 160	45.7 - 48.8	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 90% black, white, green and red diabase, green, white, gray, orange and brown quartzite, gray and brown limestone, black basalt, and light gray and brown banded tuff, 5% pink tuff (Tal), and 5% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm
160 - 170	48.8 - 51.8	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 75% black, white, green and red diabase, green, white, gray, orange and brown quartzite, gray and brown limestone, black basalt, and light gray and brown banded tuff, 20% pink tuff (Tal), and 5% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.9 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
170 - 180	51.8 - 54.9	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% black, white, green and red diabase, green, white, gray, orange and brown quartzite, gray and brown limestone, black basalt, orange chert, and light gray and brown banded tuff, 25% pink tuff (Tal), and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
180 - 190	54.9 - 57.9	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% pink tuff (Tal), 20% grayish-brown limestone, orange quartzite, black basalt, black, white and green diabase, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.9 cm
190 - 200	57.9 - 61.0	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 30% grayish-brown limestone, brown and orange quartzite, white, black and green diabase, and light gray and brown banded tuff, 30% pink tuff (Tal), and 40% matrix chips of brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
200 - 210	61.0 - 64.0	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 70% grayish-brown, orange, red and green quartzite, gray limestone, black basalt, gray chert, black, white and green diabase, 30% pink tuff (Tal), and trace matrix chips of brown silty sandstone; overall sample is 5% fines; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
210 - 220	64.0 - 67.1	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 95% clasts of black basalt, light brown, orange, gray and white quartzite, gray and brown limestone, gray chert, and black, white and green diabase, and 5% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
220 - 230	67.1 - 70.1	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 95% clasts of black basalt, light brown, orange, gray and white quartzite, gray and brown limestone, gray chert, and black, white and green diabase, and 5% matrix chips of brown silty sandstone; overall sample is 7% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.1 cm
230 - 240	70.1 - 73.2	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 95% clasts of black basalt, light brown, orange, gray and white quartzite, gray and brown limestone, gray chert, and black, white and green diabase, and 5% matrix chips of brown silty sandstone; overall sample is 7% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.1 cm
240 - 250	73.2 - 76.2	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 95% clasts of black basalt, light brown, orange, gray and white quartzite, gray and brown limestone, gray chert, and black, white and green diabase, and 5% matrix chips of brown silty sandstone; overall sample is 7% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
250 - 260	76.2 - 79.2	Matrix-supported conlgomerate; light reddish brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 65% pink tuff (Tal), 30% brown and gray quartzite, gray limestone, black basalt, light gray and brown banded tuff, and black, white and green diabase, and 5% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	trace iron oxide staining (hematite)	subangular to subrounded chips up to 2.0 cm
260 - 270	79.2 - 82.3	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 45% pink tuff (Tal), 35% brown and gray quartzite, gray limestone, black basalt, light gray and brown banded tuff, orange chert, and black, white and green diabase, and 20% matrix chips of brown silty sandstone; overall sample is 32% fines and matrix chips; reaction to acid: strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm
270 - 280	82.3 - 85.3	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% brown and gray quartzite, gray limestone, black basalt, light gray and brown banded tuff, orange chert, and black, white and green diabase, 10% pink tuff (Tal), and 20% matrix chips of brown silty sandstone; overall sample is 24% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm
280 - 290	85.3 - 88.4	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% black and green diabase, gray limestone, black basalt, orange and brown quartzite, and orange chert, 10% pink tuff (Tal), and 30% matrix chips of brown silty sandstone; overall sample is 33% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
290 - 300	88.4 - 91.4	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% black and green diabase, gray limestone, black basalt, orange and brown quartzite, and orange chert, 20% pink tuff (Tal), and 20% matrix chips of brown silty sandstone; overall sample is 32% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm
300 - 310	91.4 - 94.5	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% black and green diabase, gray limestone, black basalt, orange and brown quartzite, and orange chert, 20% pink tuff (Tal), and 20% matrix chips of brown silty sandstone; overall sample is 28% fines and matrix chips; reaction to acid: strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm
310 - 320	94.5 - 97.5	Matrix-supported conlgomerate; pink [5YR7/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 20% gray limestone, gray, orange, brown and red quartzite, white, black and green diabase, and orange and red chert, 10% pink tuff (Tal), and 70% matrix chips of brown silty sandstone; overall sample is 71% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm
320 - 330	97.5 - 100.6	Matrix-supported conlgomerate; pink [5YR7/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), 20% gray and red limestone, black and green diabase, black basalt, brownish-orange quartzite, and orange chert, and 30% matrix chips of brown silty sandstone; overall sample is 37% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
330 - 340	100.6 - 103.6	Matrix-supported conlgomerate; pink [7.5YR7/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 30% gray and red limestone, black and green diabase, black basalt, brownish-orange quartzite, and orange chert, 15% pink tuff (Tal), and 55% matrix chips of brown silty sandstone; overall sample is 26% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite)	subangular to subrounded chips up to 1.2 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
340 - 350	103.6 - 106.7	Matrix-supported conlgomerate; pink [7.5YR7/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 20% gray and red limestone, black and green diabase, black basalt, brownish-orange quartzite, and orange chert, 40% pink tuff (Tal), and 40% matrix chips of brown silty sandstone; overall sample is 46% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
350 - 360	106.7 - 109.7	Matrix-supported conlgomerate; pink [7.5YR7/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% gray and red limestone, black and green diabase, black basalt, brownish-orange quartzite, and orange chert, 30% pink tuff (Tal), and 10% matrix chips of brown silty sandstone; overall sample is 19% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
360 - 370	109.7 - 112.8	Matrix-supported conlgomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 80% gray and red limestone, black and green diabase, black basalt, brownish-orange quartzite, and orange chert, 10% pink tuff (Tal), and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite)	subangular to subrounded chips up to 1.5 cm
370 - 380	112.8 - 115.8	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 80% gray and red limestone, black and green diabase, black basalt, brownish-orange quartzite, and orange chert, 10% pink tuff (Tal), and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite)	subangular to subrounded chips up to 1.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
380 - 390	115.8 - 118.9	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% gray and red limestone, black and green diabase, black basalt, brownish-orange quartzite, and orange chert, 20% pink tuff (Tal), and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite)	subangular to subrounded chips up to 1.5 cm
390 - 400	118.9 - 121.9	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% gray and red limestone, black and green diabase, black basalt, brownish-orange quartzite, and orange chert, 20% pink tuff (Tal), and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite)	subangular to subrounded chips up to 1.5 cm
400 - 410	121.9 - 125.0	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% gray and red limestone, black and green diabase, black basalt, brownish-orange quartzite, and orange chert, 20% pink tuff (Tal), and 10% matrix chips of brown silty sandstone; overall sample is 19% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite)	subangular to subrounded chips up to 1.5 cm
410 - 420	125.0 - 128.0	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% gray and red limestone, black and green diabase, black basalt, brownish-orange quartzite, and orange chert, 20% pink tuff (Tal), and 10% matrix chips of brown silty sandstone; overall sample is 19% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite)	subangular to subrounded chips up to 1.5 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
420 - 430	128.0 - 131.1	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 20% black basalt, gray and orange chert, gray limestone, light gray and brown banded tuff, orange and brown quartzite, 20% pink tuff (Tal), and 60% matrix chips of brown silty sandstone; overall sample is 76% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
430 - 440	131.1 - 134.1	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% pink tuff (Tal), 20% black basalt, gray limestone, brown and orange quartzite, and gray chert, and 10% matrix chips of brown silty sandstone; overall sample is 37% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 0.7 cm
440 - 450	134.1 - 137.2	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), 30% black basalt, gray limestone, brown and orange quartzite, and gray chert, and 10% matrix chips of brown silty sandstone; overall sample is 37% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
450 - 460	137.2 - 140.2	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), 40% black basalt, gray limestone, brown and orange quartzite, and gray chert, and 10% matrix chips of brown silty sandstone; overall sample is 37% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.6 cm
460 - 470	140.2 - 143.3	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 40% black basalt, gray limestone, brown and orange quartzite, and gray chert, 30% pink tuff (Tal), and 30% matrix chips of brown silty sandstone; overall sample is 44% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.3 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
470 - 480	143.3 - 146.3	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), 45% black basalt, gray limestone, brown and orange quartzite, and gray chert, and 5% matrix chips of brown silty sandstone; overall sample is 33% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
480 - 490	146.3 - 149.4	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 35% pink tuff (Tal), 30% black basalt, gray limestone, brown and orange quartzite, and gray chert, and 45% matrix chips of brown silty sandstone; overall sample is 67% fines and matrix chips; reaction to acid: strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
490 - 500	149.4 - 152.4	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 55% black basalt, gray limestone, brown and orange quartzite, and gray chert, 40% pink tuff (Tal), and 5% matrix chips of brown silty sandstone; overall sample is 24% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm
500 - 510	152.4 - 155.4	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 80% pink tuff (Tal), 20% black basalt, gray limestone, brown and orange quartzite, and gray chert, and trace matrix chips of brown silty sandstone; overall sample is 15% fines; reaction to acid: strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.3 cm
510 - 520	155.4 - 158.5	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 65% pink tuff (Tal), 35% black basalt, gray limestone, brown and orange quartzite, and gray chert, and trace matrix chips of brown silty sandstone; overall sample is 10% fines; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.3 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
520 - 530	158.5 - 161.5	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), 40% black basalt, gray limestone, brown and orange quartzite, and gray chert, and 10% matrix chips of brown silty sandstone; overall sample is 28% fines; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 0.5 cm
530 - 540	161.5 - 164.6	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 80% pink tuff (Tal), 20% black basalt, orange, brown and red quartzite, gray limestone, and light gray and brown banded tuff, and trace matrix chips of brown silty sandstone; overall sample is 20% fines; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 0.2 cm
540 - 550	164.6 - 167.6	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% pink tuff (Tal), 30% black basalt, orange, brown and red quartzite, gray limestone, and light gray and brown banded tuff, and trace matrix chips of brown silty sandstone; overall sample is 20% fines; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 0.3 cm
550 - 560	167.6 - 170.7	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 75% pink tuff (Tal), 15% black basalt, orange, brown and red quartzite, gray limestone, and light gray and brown banded tuff, and 10% matrix chips of brown silty sandstone; overall sample is 20% fines; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 0.3 cm
560 - 570	170.7 - 173.7	Matrix-supported conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), 30% black basalt, brown, orange and gray quartzite, gray limestone, and orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 23% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite and limonite), trace white pasty gypsum	subangular to subrounded chips up to 0.9 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
570 - 580	173.7 - 176.8	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), 30% black basalt, brown, orange and gray quartzite, gray limestone, and orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 23% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
580 - 590	176.8 - 179.8	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), 40% black basalt, brown, orange and gray quartzite, gray limestone, and orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 23% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm
590 - 600	179.8 - 182.9	Matrix-supported conlgomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), 40% black basalt, brown, orange and gray quartzite, gray limestone, and orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 23% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
600 - 610	182.9 - 185.9	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), 30% black basalt, brown, orange and gray quartzite, gray limestone, and orange chert, and 20% matrix chips of brown silty sandstone; overall sample is 36% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
610 - 620	185.9 - 189.0	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), 30% black basalt, brown, orange and gray quartzite, gray limestone, and orange chert, and 20% matrix chips of brown silty sandstone; overall sample is 44% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
620 - 630	189.0 - 192.0	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 55% pink tuff (Tal), 35% black basalt, brown, orange and gray quartzite, gray limestone, and orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 37% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
630 - 640	192.0 - 195.1	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 65% pink tuff (Tal), 35% black basalt, brown, orange and gray quartzite, gray limestone, and orange chert, and trace matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
640 - 650	195.1 - 198.1	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), 50% black basalt, brown, orange and gray quartzite, gray limestone, and orange and red chert, and trace matrix chips of brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.4 cm
650 - 660	198.1 - 201.2	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% pink tuff (Tal), 30% black basalt, brown, orange and gray quartzite, gray limestone, and orange and red chert, and trace matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.6 cm
660 - 670	201.2 - 204.2	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% pink tuff (Tal), 30% black basalt, brown, orange and gray quartzite, gray limestone, and orange and red chert, and trace matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining, trace slickensides	subangular to subrounded chips up to 1.6 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
670 - 680	204.2 - 207.3	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), 40% black basalt, brown, orange and gray quartzite, gray limestone, and orange and red chert, and trace matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.6 cm
680 - 690	207.3 - 210.3	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), 40% black basalt, brown, orange and gray quartzite, gray limestone, and orange and red chert, and trace matrix chips of brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.6 cm
690 - 700	210.3 - 213.4	Matrix-supported conlgomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), 40% black basalt, brown, orange and gray quartzite, gray limestone, black, white and green diabase, and orange and red chert, and trace matrix chips of brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.5 cm
700 - 710	213.4 - 216.4	Matrix-supported conlgomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% black basalt, black, white, green and orange diabase, orange and brown quartzite, gray limestone, and light gray and brown banded tuff, 40% pink tuff (Tal), and trace matrix chips of pale pinkish-brown silty sandstone; overall sample is 40% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.3 cm
710 - 720	216.4 - 219.5	Matrix-supported conlgomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% black basalt, black, white, green and orange diabase, orange and brown quartzite, gray limestone, pink and red chert, and light gray and brown banded tuff, 40% pink tuff (Tal), and trace matrix chips of pale pinkish-brown silty sandstone; overall sample is 40% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
720 - 730	219.5 - 222.5	Matrix-supported conlgomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 55% pink tuff (Tal), 45% black basalt, black, white, green and orange diabase, orange, red, white and brown quartzite, gray limestone, pink and red chert, and light gray and brown banded tuff, and trace matrix chips of pale pinkish-brown silty sandstone; overall sample is 40% fines; reaction to acid: strong	trace iron oxide staining, trace manganese oxide	subangular to subrounded chips up to 1.4 cm
730 - 740	222.5 - 225.6	Matrix-supported conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 80% pink tuff (Tal), 20% black basalt, black, white, and green diabase, orange, red, white and brown quartzite, gray limestone, pink and red chert, and light gray and brown banded tuff, and trace matrix chips of brownish-pink silty sandstone; overall sample is 40% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.1 cm
740 - 750	225.6 - 228.6	Matrix-supported conlgomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 65% pink tuff (Tal), 35% black basalt, black, white, and green diabase, orange, red, white and brown quartzite, gray limestone, orange chert, and light gray and brown banded tuff, and trace matrix chips of brown silty sandstone; overall sample is 40% fines; reaction to acid: very strong	trace iron oxide staining	subangular to subrounded chips up to 1.9 cm
750 - 760	228.6 - 231.6	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 85% pink tuff (Tal), 15% black basalt, black, white, and green diabase, orange, red, white and brown quartzite, gray limestone, orange chert, and light gray and brown banded tuff, and trace matrix chips of brown silty sandstone; overall sample is 40% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.4 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
760 - 770	231.6 - 234.7	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 85% pink tuff (Tal), 15% black basalt, black, white, and green diabase, orange, red, white and brown quartzite, gray limestone, orange chert, and light gray and brown banded tuff, and trace matrix chips of brown silty sandstone; overall sample is 40% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 0.5 cm
770 - 780	234.7 - 237.7	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 85% pink tuff (Tal), 15% black basalt, black, white, and green diabase, orange, red, white and brown quartzite, gray limestone, orange and gray chert, and light gray and brown banded tuff, and trace matrix chips of brown silty sandstone; overall sample is 40% fines; reaction to acid: strong	trace iron oxide staining, trace white pasty gypsum	subangular to subrounded chips up to 0.5 cm
780 - 790	237.7 - 240.8	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), 40% black basalt, brown and red quartzite, red and orange chert, gray limestone, and black and white diabase, and trace matrix chips of brown silty sandstone; overall sample is 30% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.2 cm
790 - 800	240.8 - 243.8	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 80% pink tuff (Tal), 20% black basalt, brown and red quartzite, red and orange chert, gray limestone, and black and white diabase, trace vein quartz, and trace matrix chips of brown silty sandstone; overall sample is 20% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.5 cm
800 - 810	243.8 - 246.9	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 90% pink tuff (Tal), 10% black basalt, brown and red quartzite, red and orange chert, gray limestone, and black and white diabase, trace vein quartz, and trace matrix chips of brown silty sandstone; overall sample is 35% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.8 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
810 - 820	246.9 - 249.9	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 90% pink tuff (Tal), 10% black basalt, brown and red quartzite, red and orange chert, gray limestone, and black and white diabase, trace vein quartz, and trace matrix chips of brown silty sandstone; overall sample is 40% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.5 cm
820 - 830	249.9 - 253.0	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 90% pink tuff (Tal), 10% black basalt, brown and red quartzite, red, gray and orange chert, gray limestone, and black and white diabase, trace vein quartz, and trace matrix chips of brown silty sandstone; overall sample is 30% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.5 cm
830 - 840	253.0 - 256.0	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 75% pink tuff (Tal), 25% black basalt, brown and red quartzite, red, gray and orange chert, gray limestone, and black and white diabase, trace vein quartz, and trace matrix chips of brown silty sandstone; overall sample is 30% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.8 cm
840 - 850	256.0 - 259.1	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 55% pink tuff (Tal), 35% black basalt, brown, green, orange and red quartzite, grayish-brown limestone, orange and gray chert, and green and black diabase, and 10% matrix chips of brown silty sandstone; overall sample is 37% fines and matrix chips; reaction to acid: strong	some iron oxide staining	subangular to subrounded chips up to 1.6 cm
850 - 860	259.1 - 262.1	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 85% pink tuff (Tal), 15% black basalt, gray limestone, brown and green quartzite, and gray chert, and trace matrix chips of brown silty sandstone; overall sample is 30% fines; reaction to acid: strong	trace iron oxide staining, trace manganese oxide, trace white pasty gypsum	subangular to subrounded chips up to 1.4 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
860 - 870	262.1 - 265.2	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 95% pink tuff (Tal), 5% black basalt, gray limestone, brown and green quartzite, and gray chert, and trace matrix chips of brown silty sandstone; overall sample is 30% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
870 - 880	265.2 - 268.2	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 95% pink tuff (Tal), 5% black basalt, gray limestone, brown and green quartzite, and gray chert, and trace matrix chips of brown silty sandstone; overall sample is 20% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
880 - 890	268.2 - 271.3	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 90% pink tuff (Tal), 10% black basalt, gray limestone, brown and green quartzite, and gray chert, and trace matrix chips of brown silty sandstone; overall sample is 20% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.2 cm
890 - 900	271.3 - 274.3	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 90% pink tuff (Tal), 10% black basalt, gray limestone, brown and green quartzite, and gray chert, and trace matrix chips of brown silty sandstone; overall sample is 35% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.1 cm
900 - 910	274.3 - 277.4	Matrix-supported conlgomerate; reddish brown [5YR5/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% black basalt, gray limestone, brown and green quartzite, and gray chert, and trace matrix chips of brown silty sandstone; overall sample is 15% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 0.7 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
910 - 920	277.4 - 280.4	Matrix-supported conlgomerate; reddish brown [5YR5/4]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 98% pink tuff (Tal), 2% black and red limestone, brown quartzite, and orange chert, and trace matrix chips of brown silty sandstone; overall sample is 20% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
920 - 930	280.4 - 283.5	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 98% pink tuff (Tal), 2% black and red limestone, brown quartzite, and orange chert, and trace matrix chips of brown silty sandstone; overall sample is 15% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
930 - 940	283.5 - 286.5	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 90% pink tuff (Tal), 10% black and red limestone, brown quartzite, and orange chert, and trace matrix chips of brown silty sandstone; overall sample is 15% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.4 cm
940 - 950	286.5 - 289.6	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of pink tuff (Tal), trace black and red limestone, brown quartzite, and orange chert, and trace matrix chips of brown silty sandstone; overall sample is 25% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.1 cm
950 - 960	289.6 - 292.6	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 85% pink tuff (Tal), 15% black and red limestone, brown quartzite, and orange chert, and trace matrix chips of brown silty sandstone; overall sample is 30% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 2.0 cm
960 - 970	292.6 - 295.7	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% black and red limestone, brown quartzite, and orange chert, and trace matrix chips of brown silty sandstone; overall sample is 20% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.3 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
970 - 980	295.7 - 298.7	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% black and red limestone, brown quartzite, and orange chert, and trace matrix chips of brown silty sandstone; overall sample is 20% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.1 cm
980 - 990	298.7 - 301.8	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of 95% pink tuff (Tal), 5% black basalt, brown and red quartzite, gray and red limestone, green diabase, and red chert, and trace matrix chips of brown silty sandstone; overall sample is 10% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
990 - 1,000	301.8 - 304.8	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of pink tuff (Tal), trace black basalt, brown and red quartzite, gray and red limestone, green diabase, and red chert, and trace matrix chips of brown silty sandstone; overall sample is 5% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.4 cm
1,000 - 1,010	304.8 - 307.8	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 80% pink tuff (Tal), trace gray limestone and red quartzite, and 20% matrix chips of brown silty sandstone; overall sample is 32% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.4 cm
1,010 - 1,020	307.8 - 310.9	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 40% pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and 60% matrix chips of brown silty sandstone; overall sample is 68% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace slickensides, trace white pasty gypsum	subangular to subrounded chips up to 1.2 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,020 - 1,030	310.9 - 313.9	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 40% pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and 60% matrix chips of brown silty sandstone; overall sample is 62% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.5 cm
1,030 - 1,040	313.9 - 317.0	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and 30% matrix chips of brown silty sandstone; overall sample is 33% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.5 cm
1,040 - 1,050	317.0 - 320.0	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and trace matrix chips of brown silty sandstone; overall sample is 10% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,050 - 1,060	320.0 - 323.1	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and trace matrix chips of brown silty sandstone; overall sample is 10% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,060 - 1,070	323.1 - 326.1	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 70% pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and 30% matrix chips of brown silty sandstone; overall sample is 37% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.4 cm
1,070 - 1,080	326.1 - 329.2	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 20% pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and 80% matrix chips of brown silty sandstone; overall sample is 82% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,080 - 1,090	329.2 - 332.2	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and 40% matrix chips of brown silty sandstone; overall sample is 46% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.5 cm
1,090 - 1,100	332.2 - 335.3	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; silty sand; cut chips are clasts of 90% pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and 10% matrix chips of brown silty sandstone; overall sample is 91% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.3 cm
1,100 - 1,110	335.3 - 338.3	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 85% pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and 15% matrix chips of brown silty sandstone; overall sample is 28% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,110 - 1,120	338.3 - 341.4	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 85% pink tuff (Tal), trace black basalt, brown quartzite, and gray limestone, and 15% matrix chips of brown silty sandstone; overall sample is 28% fines; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,120 - 1,130	341.4 - 344.4	Matrix-supported conlgomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), trace brown and red quartzite, brown limestone, and black basalt, and 50% matrix chips of brown silty sandstone; overall sample is 67% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,130 - 1,140	344.4 - 347.5	Matrix-supported conlgomerate; light reddish brown [5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), trace brown and red quartzite, brown limestone, and black basalt, and 50% matrix chips of brown silty sandstone; overall sample is 62% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.4 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,140 - 1,150	347.5 - 350.5	Matrix-supported conlgomerate; pink [7.5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 60% pink tuff (Tal), trace gray limestone, black and green diabase, and brown quartzite, and 40% matrix chips of brown silty sandstone; overall sample is 49% fines and matrix chips; reaction to acid: moderate		subangular to subrounded chips up to 0.7 cm
1,150 - 1,160	350.5 - 353.6	Matrix-supported conlgomerate; pink [7.5YR7/3]; moderately lithified; silty sand; cut chips are clasts of 10% pink tuff (Tal), trace gray limestone, black and green diabase, and brown quartzite, and 90% matrix chips of brown silty sandstone; overall sample is 91% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,160 - 1,170	353.6 - 356.6	Matrix-supported conlgomerate; pink [7.5YR7/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 40% pink tuff (Tal), trace gray limestone, black and green diabase, and brown quartzite, and 60% matrix chips of brown silty sandstone; overall sample is 62% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace slickensides on tuff chip	subangular to subrounded chips up to 1.0 cm
1,170 - 1,180	356.6 - 359.7	Matrix-supported conlgomerate; pink [7.5YR7/3]; moderately lithified; gravelly sand; cut chips are clasts of 95% pink tuff (Tal), trace gray limestone, black and green diabase, and brown quartzite, and 5% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace slickensides on tuff chip	subangular to subrounded chips up to 1.1 cm
1,180 - 1,190	359.7 - 362.7	Matrix-supported conlgomerate; pink [7.5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), trace gray limestone, black and green diabase, and brown quartzite, and 50% matrix chips of brown silty sandstone; overall sample is 55% fines and matrix chips; reaction to acid: strong		subangular to subrounded chips up to 1.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,190 - 1,200	362.7 - 365.8	Matrix-supported conlgomerate; pink [5YR7/3]; moderately lithified; silty sand; cut chips are clasts of 10% pink tuff (Tal), trace gray chert and black and green diabase, and 90% matrix chips of brown silty sandstone; overall sample is 90% fines and matrix chips; reaction to acid: weak		subangular to subrounded chips up to 1.2 cm
1,200 - 1,210	365.8 - 368.8	Matrix-supported conlgomerate; pink [5YR7/3]; moderately lithified; silty sand; cut chips are clasts of 10% pink tuff (Tal), trace gray chert and black and green diabase, and 90% matrix chips of brown silty sandstone; overall sample is 90% fines and matrix chips; reaction to acid: moderate		subangular to subrounded chips up to 1.4 cm
1,210 - 1,220	368.8 - 371.9	Matrix-supported conlgomerate; pink [5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 50% pink tuff (Tal), trace gray chert and black and green diabase, and 50% matrix chips of brown silty sandstone; overall sample is 52% fines and matrix chips; reaction to acid: moderate		subangular to subrounded chips up to 1.0 cm
1,220 - 1,230	371.9 - 374.9	Matrix-supported conlgomerate; pink [5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 70% pink tuff (Tal), trace gray limestone, black and green diabase, and brown quartzite, and 30% matrix chips of brown silty sandstone; overall sample is 33% fines and matrix chips; reaction to acid: moderate	trace slickensides on tuff chip	subangular to subrounded chips up to 1.1 cm
1,230 - 1,240	374.9 - 378.0	Matrix-supported conlgomerate; pink [5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 70% pink tuff (Tal), trace gray limestone, black and green diabase, and brown quartzite, and 30% matrix chips of brown silty sandstone; overall sample is 33% fines and matrix chips; reaction to acid: moderate	trace slickensides on tuff chip, trace white pasty gypsum	subangular to subrounded chips up to 1.1 cm
1,240 - 1,250	378.0 - 381.0	Matrix-supported conlgomerate; pink [5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 90% pink tuff (Tal), trace gray limestone, black and green diabase, and brown quartzite, and 10% matrix chips of brown silty sandstone; overall sample is 23% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace slickensides on tuff chip, trace white pasty gypsum	subangular to subrounded chips up to 1.6 cm

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DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,250 - 1,260	381.0 - 384.0	Matrix-supported conlgomerate; brown [7.5YR5/4]; moderately lithified; gravelly silty sand; cut chips are clasts of 80% pink tuff (Tal), trace gray limestone, black and green diabase, and brown quartzite, and 20% matrix chips of brown silty sandstone; overall sample is 32% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace white pasty gypsum	subangular to subrounded chips up to 1.0 cm
1,260 - 1,270	384.0 - 387.1	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 70% pinkish-brown tuff (Tal), trace red and gray limestone, and 30% matrix chips of brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,270 - 1,280	387.1 - 390.1	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are 70% clasts of pinkish-brown tuff (Tal), and 30% matrix chips of brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace white pasty gypsum	subangular to subrounded chips up to 1.0 cm
1,280 - 1,290	390.1 - 393.2	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 70% pinkish-brown tuff (Tal), trace silvery schist and brown quartzite, and 30% matrix chips of brown silty sandstone; overall sample is 47% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace white pasty gypsum	subangular to subrounded chips up to 1.0 cm
1,290 - 1,300	393.2 - 396.2	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 70% pinkish-brown tuff (Tal), trace silvery schist, brown quartzite and gray chert, and 30% matrix chips of brown silty sandstone; overall sample is 44% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace white pasty gypsum	subangular to subrounded chips up to 1.0 cm
1,300 - 1,310	396.2 - 399.3	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of pinkish-brown tuff (Tal), trace silvery schist, brown quartzite and gray chert, and trace matrix chips of brown silty sandstone; overall sample is 30% fines; reaction to acid: moderate	trace iron oxide staining, trace white pasty gypsum	subangular to subrounded chips up to 1.0 cm

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Resolution Copper Mining
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DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,310 - 1,320	399.3 - 402.3	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 75% pinkish-brown tuff (Tal), trace black, white and green diabase, brown quartzite, gray chert, and gray limestone, and 25% matrix chips of brown silty sandstone; overall sample is 59% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace white pasty gypsum	subangular to subrounded chips up to 1.0 cm
1,320 - 1,330	402.3 - 405.4	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 75% pinkish-brown tuff (Tal), trace brown quartzite and black and green diabase, and 25% matrix chips of brown silty sandstone; overall sample is 44% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace white pasty gypsum	subangular to subrounded chips up to 1.0 cm
1,330 - 1,340	405.4 - 408.4	Matrix-supported conlgomerate; pink [7.5YR7/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 75% pinkish-brown tuff (Tal), trace brown quartzite and black and green diabase, and 25% matrix chips of brown silty sandstone; overall sample is 55% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace white pasty gypsum	subangular to subrounded chips up to 1.0 cm
1,340 - 1,350	408.4 - 411.5	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 70% pinkish-brown tuff (Tal), trace brown quartzite and black and green diabase, and 30% matrix chips of brown silty sandstone; overall sample is 51% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace white pasty gypsum	subangular to subrounded chips up to 1.0 cm
1,350 - 1,360	411.5 - 414.5	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% pinkish-brown tuff (Tal), 10% black basalt, brown quartzite, brown chert, gray limestone, and black and green diabase, and 60% matrix chips of brown silty sandstone; overall sample is 78% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm

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DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,360 - 1,370	414.5 - 417.6	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% pinkish-brown tuff (Tal), 10% black basalt, brown quartzite, brown chert, gray limestone, and black and green diabase, and 60% matrix chips of brown silty sandstone; overall sample is 78% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,370 - 1,380	417.6 - 420.6	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% pinkish-brown tuff (Tal), 10% black basalt, brown quartzite, brown and red chert, gray limestone, and black and green diabase, and 60% matrix chips of brown silty sandstone; overall sample is 72% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,380 - 1,390	420.6 - 423.7	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% pinkish-brown tuff (Tal), 10% black basalt, brown quartzite, brown and red chert, gray, red and yellow limestone, and black and green diabase, and 60% matrix chips of brown silty sandstone; overall sample is 72% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 1.0 cm
1,390 - 1,400	423.7 - 426.7	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 35% pinkish-brown tuff (Tal), 5% black basalt, brown quartzite, brown and red chert, gray, red and yellow limestone, and black and green diabase, and 60% matrix chips of brown silty sandstone; overall sample is 72% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace dendritic manganese oxide on limestone chip	subangular to subrounded chips up to 1.0 cm
1,400 - 1,420	426.7 - 432.8	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 45% pinkish-brown tuff (Tal), 5% black basalt, red and brown quartzite, silvery schist and gray limestone, and 50% matrix chips of brown silty sandstone; overall sample is 65% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.4 cm; Drillers collected samples every 20 feet by mistake for 1400-1520 feet

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,420 - 1,440	432.8 - 438.9	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 45% pinkish-brown tuff (Tal), 5% black basalt, red and brown quartzite, silvery schist and gray limestone, and 50% matrix chips of brown silty sandstone; overall sample is 70% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.4 cm
1,440 - 1,460	438.9 - 445.0	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% pinkish-brown tuff (Tal), 5% black basalt, red and brown quartzite, silvery schist, clear vein quartz and gray limestone, and 75% matrix chips of brown silty sandstone; overall sample is 89% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 1.4 cm
1,460 - 1,480	445.0 - 451.1	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; silty sand; cut chips are clasts of 20% pinkish-brown tuff (Tal), 5% black and green diabase, yellow and gray limestone, red chert, and black basalt, and 75% matrix chips of brown silty sandstone; overall sample is 89% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 2.0 cm
1,480 - 1,500	451.1 - 457.2	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; silty sand; cut chips are clasts of 20% pinkish-brown and light gray tuff (Tal), 5% black and green diabase, yellow and gray limestone, red chert, and black basalt, and 75% matrix chips of brown silty sandstone; overall sample is 86% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 2.0 cm
1,500 - 1,520	457.2 - 463.3	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% pinkish-brown tuff (Tal), 20% gray limestone, red chert, green and brown quartzite, and black basalt, and 60% matrix chips of brown silty sandstone; overall sample is 68% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace manganese oxide	subangular to subrounded chips up to 1.8 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,520 - 1,530	463.3 - 466.3	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% black basalt, red and gray chert, pink and gray limestone, brown and orange quartzite, and black and white diabase, 10% pinkish-brown (Tal), and 50% matrix chips of brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	REVERSE CIRCULATION AIR PERCUSSION; subangular to subrounded chips up to 0.4 cm; 20% green cement chips
1,530 - 1,540	466.3 - 469.4	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% black basalt, red and gray chert, pink and gray limestone, brown and orange quartzite, and black and white diabase, 10% pinkish-brown (Tal), and 40% matrix chips of brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 0.4 cm; 30% green cement chips
1,540 - 1,550	469.4 - 472.4	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 15% black basalt, gray limestone, brown quartzite, and brown chert, 30% pinkish-brown (Tal), and 55% matrix chips of brown silty sandstone; overall sample is 55% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 0.5 cm
1,550 - 1,560	472.4 - 475.5	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% pinkish-brown (Tal), 10% black basalt, gray limestone, brown quartzite, and brown chert, and 70% matrix chips of brown silty sandstone; overall sample is 70% fines and matrix chips; reaction to acid: weak to moderate	trace iron oxide staining	subangular to subrounded chips up to 0.7 cm
1,560 - 1,570	475.5 - 478.5	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% black basalt, gray limestone, brown quartzite, and brown and red chert, 10% pinkish-brown (Tal), and 70% matrix chips of brown silty sandstone; overall sample is 70% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 0.7 cm

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DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- Tal-rich (QTg)				
1,570 - 1,580	478.5 - 481.6	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 20% black basalt, gray limestone, brown quartzite, yellow mudstone, and brown and red chert, 10% pinkish-brown (Tal), and 70% matrix chips of brown silty sandstone; overall sample is 70% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining, trace manganese oxide	subangular to subrounded chips up to 0.5 cm
1,580 - 1,590	481.6 - 484.6	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% black basalt, gray limestone, brown quartzite, and brown and red chert, 10% pinkish-brown (Tal), and 60% matrix chips of brown silty sandstone; overall sample is 60% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 0.6 cm
1,590 - 1,600	484.6 - 487.7	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 15% black basalt, gray limestone, brown quartzite, black and white diabase, and brown, gray and red chert, 10% pinkish-brown (Tal), and 75% matrix chips of brown silty sandstone; overall sample is 75% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining	subangular to subrounded chips up to 0.6 cm
1,600 - 1,610	487.7 - 490.7	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% black basalt, gray and brown limestone, green, brown and orange quartzite, and red and gray chert, 20% pinkish-brown (Tal), and 50% matrix chips of brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: strong	trace iron oxide staining, trace manganese oxide	subangular to subrounded chips up to 0.5 cm
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,610 - 1,620	490.7 - 493.8	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 30% black basalt, gray and brown limestone, green, brown, red and orange quartzite, vein quartz and red and gray chert, 10% pinkish-brown (Tal), and 60% matrix chips of brown silty sandstone; overall sample is 60% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 0.6 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,620 - 1,630	493.8 - 496.8	Matrix-supported conlgomerate; pale brown [10YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 40% black basalt, gray and brown limestone, green, brown, red and orange quartzite, gray schist, vein quartz and red and gray chert, 10% pinkish-brown (Tal), and 50% matrix chips of brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 0.6 cm
1,630 - 1,640	496.8 - 499.9	Matrix-supported conlgomerate; pale brown [10YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 50% black basalt, gray and brown limestone, green, brown, red and orange quartzite, gray schist, vein quartz and red and gray chert, 15% pinkish-brown (Tal), and 35% matrix chips of brown silty sandstone; overall sample is 35% fines and matrix chips; reaction to acid: very strong	trace iron oxide staining, trace manganese oxide	subangular to subrounded chips up to 0.9 cm
1,640 - 1,650	499.9 - 502.9	Matrix-supported conlgomerate; light brown [7.5YR6/3]; moderately lithified; gravelly silty sand; cut chips are clasts of 75% black basalt, gray, red and brown limestone, green, brown, red and orange quartzite, vein quartz and red, brown and gray chert, 10% pinkish-brown (Tal), and 15% matrix chips of brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
1,650 - 1,660	502.9 - 506.0	Matrix-supported conlgomerate; light brown [7.5YR6/3]; well lithified; gravelly silty sand; cut chips are clasts of 70% black basalt, gray, red and brown limestone, green, brown, red and orange quartzite, vein quartz and red, brown and gray chert, 10% pinkish-brown (Tal), and 20% matrix chips of well-lithified brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,660 - 1,670	506.0 - 509.0	Matrix-supported conlgomerate; light brown [7.5YR6/3]; well lithified; gravelly silty sand; cut chips are clasts of 75% black basalt, gray, red and brown limestone, green, brown, red and orange quartzite, vein quartz and red, brown and gray chert, 10% pinkish-brown (Tal), and 15% matrix chips of well-lithified brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
1,670 - 1,680	509.0 - 512.1	Matrix-supported conlgomerate; reddish brown [5YR5/3]; well lithified; gravelly silty sand; cut chips are clasts of 50% black basalt, gray, red and brown limestone, green, brown, red and orange quartzite, vein quartz and red, brown and gray chert, 10% pinkish-brown (Tal), and 40% matrix chips of well-lithified brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
1,680 - 1,690	512.1 - 515.1	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; well lithified; gravelly silty sand; cut chips are clasts of 55% black basalt, gray, red and brown limestone, green, brown, red and orange quartzite, vein quartz and red, brown and gray chert, 5% pinkish-brown (Tal), and 40% matrix chips of well-lithified brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite), trace rhombohedral calcite	subangular to subrounded chips up to 0.5 cm
1,690 - 1,700	515.1 - 518.2	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; well lithified; gravelly silty sand; cut chips are clasts of 65% black basalt, gray, red and brown limestone, green, brown, red and orange quartzite, vein quartz and red, brown and gray chert, 5% pinkish-brown (Tal), and 35% matrix chips of well-lithified brown silty sandstone; overall sample is 35% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,700 - 1,710	518.2 - 521.2	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; well lithified; gravelly silty sand; cut chips are 60% clasts of black basalt, brown, red and orange quartzite, brown, gray and red limestone, red chert, and pink tuff (Tal), and 40% matrix chips of well-lithified brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite), trace manganese oxide	subangular to subrounded chips up to 1.0 cm
1,710 - 1,720	521.2 - 524.3	Matrix-supported conlgomerate; pinkish gray [5YR7/2]; well lithified; gravelly silty sand; cut chips are 50% black basalt, brown, red and orange quartzite, brown, gray and red limestone, red chert, and pink tuff (Tal), and 50% matrix chips of well-lithified brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
1,720 - 1,730	524.3 - 527.3	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; well lithified; gravelly silty sand; cut chips are 50% clasts of black basalt, brown, red and orange quartzite, brown, gray and red limestone, gray schist, red chert, and pink tuff (Tal), and 50% matrix chips of well-lithified brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite), trace white calcite	subangular to subrounded chips up to 0.6 cm
1,730 - 1,740	527.3 - 530.4	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; well lithified; gravelly silty sand; cut chips are 50% clasts of black basalt, brown, red and orange quartzite, brown, gray and red limestone, gray schist, red chert, and pink tuff (Tal), and 50% matrix chips of well-lithified brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
1,740 - 1,750	530.4 - 533.4	Matrix-supported conlgomerate; light reddish brown [5YR6/3]; well lithified; gravelly silty sand; cut chips are 70% clasts of black basalt, red and brown quartzite, gray, brown and red limestone, gray and red chert, and pink tuff (Tal), and 30% matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: very strong	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 0.7 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,750 - 1,760	533.4 - 536.4	Matrix-supported conlgomerate; light brown [7.5YR6/3]; well lithified; gravelly silty sand; cut chips are 40% clasts of black basalt, red and brown quartzite, black and white diabase, red chert, gray limestone, and pink tuff (Tal), and 60% matrix chips of brown silty sandstone; overall sample is 60% fines and matrix chips; reaction to acid: strong	trace iron oxide staining	subangular to subrounded chips up to 0.5 cm
1,760 - 1,770	536.4 - 539.5	Matrix-supported conlgomerate; pale brown [10YR6/3]; well lithified; gravelly silty sand; cut chips are 15% clasts of black basalt, black, white and green diabase, brown and red quartzite, pinkish-white limestone, red chert, pink tuff, and gray schist, and 85% matrix chips of brown silty sandstone; overall sample is 85% fines and matrix chips; reaction to acid: weak	trace iron oxide staining	subangular to subrounded chips up to 0.4 cm
1,770 - 1,780	539.5 - 542.5	Matrix-supported conlgomerate; pale brown [10YR6/3]; well lithified; gravelly silty sand; cut chips are 15% clasts of black basalt, black, white and green diabase, brown and red quartzite, pinkish-white limestone, more red chert, pink tuff, and gray schist, and 85% matrix chips of brown silty sandstone; overall sample is 85% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite)	subangular to subrounded chips up to 0.4 cm
1,780 - 1,790	542.5 - 545.6	Matrix-supported conlgomerate; pale brown [10YR6/3]; well lithified; gravelly silty sand; cut chips are 15% clasts of black basalt, black, white and green diabase, brown and red quartzite, pinkish-white limestone, red chert, pink tuff, and gray schist, and 85% matrix chips of brown silty sandstone; overall sample is 85% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite)	subangular to subrounded chips up to 0.6 cm
1,790 - 1,800	545.6 - 548.6	Matrix-supported conlgomerate; very pale brown [10YR7/2]; well lithified; gravelly silty sand; cut chips are 15% clasts of black basalt, black, white and green diabase, brown and red quartzite, pinkish-white limestone, less red chert, pink tuff, and gray schist, trace yellow tuff, and 85% matrix chips of brown silty sandstone; overall sample is 85% fines and matrix chips; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.3 cm

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Resolution Copper Mining
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DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- tuff (Tvs)				
1,800 - 1,810	548.6 - 551.7	Tuff and Basalt; pale yellow [5Y8/3], olive gray [5Y4/2], and weak red [10R4/3]; well lithified; 55% yellow and white tuff with an aphanitic groundmass and tiny lithic fragments, 40% dark brown basalt, 5% red scoria, trace Gila matrix chips and clasts of gray limestone, red chert, and brown quartzite; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.5 cm
1,810 - 1,820	551.7 - 554.7	Tuff and Basalt; pale yellow [5Y8/3], olive gray [5Y4/2], and weak red [10R4/3]; well lithified; 70% yellow and white tuff with an aphanitic groundmass and tiny lithic fragments, 20% dark brown basalt, 10% red scoria, trace Gila matrix chips and clasts of gray limestone, red chert, and brown quartzite; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.9 cm
1,820 - 1,830	554.7 - 557.8	Tuff and Basalt; pale yellow [5Y8/3]; well lithified; 85% yellow and white tuff with an aphanitic groundmass and tiny lithic fragments, 15% dark brown basalt, trace red scoria, trace Gila matrix chips and clasts of gray limestone, red chert, and brown quartzite; reaction to acid: weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 0.2 cm
1,830 - 1,840	557.8 - 560.8	Tuff and Basalt; pale yellow [5Y8/3]; well lithified; 85% yellow and white tuff with an aphanitic groundmass and tiny lithic fragments, 15% dark brown basalt, trace red scoria, trace Gila matrix chips and clasts of gray limestone, red chert, and brown quartzite; reaction to acid: very weak	trace iron oxide staining	subangular to subrounded chips up to 0.5 cm
1,840 - 1,850	560.8 - 563.9	Tuff and Scoria; pale yellow [5Y8/3] and weak red [10R4/3]; well lithified; 60% yellow and white tuff with an aphanitic groundmass, phenocrysts of white feldspar and tiny lithics, 35% red scoria, 5% black and brown basalt; reaction to acid: very weak	some iron oxide staining, trace calcite, trace calcite amygdules in scoria	subangular to subrounded chips up to 1.0 cm
TERTIARY VOLCANICS- tuffaceous sandstone and scoria (Tvs)				
1,850 - 1,860	563.9 - 566.9	Tuffaceous Sandstone and Scoria; pale yellow [5Y8/3] and weak red [10R4/3]; well lithified; 60% pinkish-brown tuffaceous sandstone and yellow tuff, 35% red scoria, 5% brown basalt; reaction to acid: weak	common iron oxide staining, trace vein quartz	subangular to subrounded chips up to 0.4 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- tuffaceous sandstone and scoria (Tvs)				
1,860 - 1,870	566.9 - 570.0	Scoria, Tuffaceous Sandstone, and Tuff; pale yellow [5Y8/3] and weak red [10R4/3]; well lithified; 40% red clayey scoria, 30% pinkish-brown tuffaceous sandstone, 20% yellow and white tuff with phenocrysts of white feldspar with reaction rims and tiny lithics, 10% brown basalt; reaction to acid: moderate	abundant iron oxide staining, trace slickensides, calcite in scoria, trace vein quartz	subangular to subrounded chips up to 1.3 cm
TERTIARY VOLCANICS- basalt (Tvs)				
1,870 - 1,880	570.0 - 573.0	Basalt and Scoria; weak red [10R4/3], reddish black [10R2.5/1], and pale yellow [2.5Y7/3]; well lithified; 70% dark gray to black basalt, 20% dark red scoria, 10% pinkish-brown tuffaceous sandstone; reaction to acid: very weak	common iron oxide staining and speckling, trace vein quartz	subangular to subrounded chips up to 0.9 cm
1,880 - 1,890	573.0 - 576.1	Basalt; black [N2.5]; well lithified; black basalt; reaction to acid: very weak	trace iron oxide speckling (hematite) on fracture surfaces, trace slickensides, trace white gypsum and calcite on fracture surfaces, trace green serpentine	subangular to subrounded chips up to 2.5 cm
1,890 - 1,900	576.1 - 579.1	Basalt; black [N2.5]; well lithified; black basalt; reaction to acid: very weak	trace iron oxide speckling (hematite), trace white gypsum on fracture surfaces, trace calcite, trace green serpentine	subangular to subrounded chips up to 0.3 cm
1,900 - 1,910	579.1 - 582.2	Basalt; black [N2.5]; well lithified; black basalt; reaction to acid: very weak	trace iron oxide speckling (hematite), trace white gypsum on fracture surfaces, trace calcite, trace green serpentine	subangular to subrounded chips up to 1.8 cm
1,910 - 1,920	582.2 - 585.2	Basalt; black [N2.5]; well lithified; black basalt; reaction to acid: very weak	trace iron oxide speckling (hematite), trace white gypsum on fracture surfaces, trace calcite, trace green serpentine	subangular to subrounded chips up to 2.5 cm
1,920 - 1,930	585.2 - 588.3	Basalt; black [N2.5]; well lithified; black basalt; reaction to acid: very weak	trace iron oxide speckling (hematite), trace gypsum, calcite and serpentine in fractures	subangular to subrounded chips up to 1.7 cm
1,930 - 1,940	588.3 - 591.3	Basalt; black [N2.5]; well lithified; black basalt, trace red sandstone; reaction to acid: very weak	trace iron oxide speckling (hematite)	subangular to subrounded chips up to 1.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- paleosol (Tvs)				
1,940 - 1,950	591.3 - 594.4	Paleosol; weak red [10R5/4]; moderately lithified; red paleosol of baked sandstone and mudstone, trace black basalt, 5% red clayey silt; reaction to acid: very weak	abundant iron oxide staining (hematite), trace manganese oxide, trace white vein quartz	subangular to subrounded chips up to 2.2 cm
1,950 - 1,960	594.4 - 597.4	Paleosol; reddish brown [2.5YR4/4]; moderately lithified; red paleosol of baked sandstone and mudstone, trace black basalt, 5% red clayey silt; reaction to acid: weak	abundant iron oxide staining (hematite)	subangular to subrounded chips up to 1.1 cm
1,960 - 1,970	597.4 - 600.5	Paleosol; brown [7.5YR5/3]; moderately lithified; reddish-brown paleosol of baked sandstone and mudstone, trace black basalt, 10% brown clayey silt; reaction to acid: very weak	some iron oxide staining (hematite)	subangular to subrounded chips up to 1.1 cm
TERTIARY VOLCANICS- basalt (Tvs)				
1,970 - 1,980	600.5 - 603.5	Basalt and Paleosol; black [N2.5] and brown [7.5YR5/3]; well lithified; 80% brown to black basalt, 20% brown paleosol of sandstone and mudstone, trace brown clayey silt; reaction to acid: very weak	trace iron oxide staining, gypsum amygdules in basalt, trace white vein quartz	subangular to subrounded chips up to 1.2 cm
1,980 - 1,990	603.5 - 606.6	Basalt; black [N2.5]; well lithified; black basalt, trace brown sandstone; reaction to acid: very weak	trace iron oxide speckling, trace calcite amygdules	subangular to subrounded chips up to 1.2 cm
1,990 - 2,000	606.6 - 609.6	Basalt; black [N2.5]; well lithified; black basalt; reaction to acid: very weak	trace iron oxide speckling, green serpentine and white gypsum on fracture surfaces, trace calcite	subangular to subrounded chips up to 2.0 cm
2,000 - 2,010	609.6 - 612.6	Basalt; reddish black [2.5YR2.5/1]; well lithified; brownish-black basalt, trace brown chert in gray limestone; reaction to acid: very weak	some iron oxide staining (hematite), white gypsum and green serpentine on fracture surfaces, trace calcite	subangular to subrounded chips up to 1.9 cm
2,010 - 2,020	612.6 - 615.7	Basalt; black [10YR2/1]; well lithified; black basalt; reaction to acid: very weak	trace iron oxide staining (hematite), white and brown gypsum and trace green serpentine on fracture surfaces, trace calcite	subangular to subrounded chips up to 1.7 cm
2,020 - 2,030	615.7 - 618.7	Basalt; black [10YR2/1]; well lithified; brownish-black basalt, trace brown sandstone; reaction to acid: very weak	trace iron oxide staining, white gypsum and green serpentine on fracture surfaces	subangular to subrounded chips up to 1.6 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- basalt (Tvs)				
2,030 - 2,040	618.7 - 621.8	Basalt; black [10YR2/1]; well lithified; brownish-black basalt, trace brown sandstone; reaction to acid: very weak	trace iron oxide staining, white gypsum and green serpentine on fracture surfaces	subangular to subrounded chips up to 2.1 cm
2,040 - 2,050	621.8 - 624.8	Basalt; black [10YR2/1]; well lithified; brownish-black basalt, trace brown sandstone; reaction to acid: very weak	trace iron oxide staining, white gypsum and green serpentine on fracture surfaces	subangular to subrounded chips up to 1.2 cm
2,050 - 2,060	624.8 - 627.9	Basalt; black [10YR2/1]; well lithified; black basalt; reaction to acid: very weak	trace iron oxide staining (hematite), trace green serpentine and white gypsum on fracture surfaces, trace calcite	subangular to subrounded chips up to 1.7 cm
2,060 - 2,070	627.9 - 630.9	Basalt; black [10YR2/1]; well lithified; black basalt; reaction to acid: very weak	trace iron oxide staining (hematite), trace green serpentine and white gypsum on fracture surfaces, trace calcite	subangular to subrounded chips up to 0.8 cm
2,070 - 2,080	630.9 - 634.0	Basalt; black [10YR2/1] and reddish brown [5YR4/3]; well lithified; 90% brownish-black basalt, 10% reddish-brown paleosol of siltstone; reaction to acid: very weak	some iron oxide staining (hematite), white gypsum and green serpentine on fracture surfaces, trace calcite	subangular to subrounded chips up to 1.7 cm
2,080 - 2,090	634.0 - 637.0	Basalt; black [10YR2/1] and reddish brown [5YR4/3]; well lithified; 95% brownish-black basalt, 5% reddish-brown paleosol of siltstone; reaction to acid: very weak	some iron oxide staining (hematite), white gypsum and green serpentine on fracture surfaces, trace calcite	subangular to subrounded chips up to 0.5 cm
2,090 - 2,100	637.0 - 640.1	Basalt; black [10YR2/1] and reddish brown [5YR4/3]; well lithified; 90% brownish-black basalt, 10% red paleosol of siltstone and clayey scoria, trace red clayey silt; reaction to acid: very weak	common iron oxide staining (hematite), trace white gypsum on fracture surfaces, trace calcite	subangular to subrounded chips up to 0.6 cm
2,100 - 2,110	640.1 - 643.1	Basalt and Paleosol; very dark gray [5YR3/1] and red [10R4/6]; well lithified; 60% brownish-black basalt, 40% red paleosol of sandstone and scoria, trace red clayey silt; reaction to acid: very weak	common iron oxide staining (hematite and limonite), trace white gypsum and green serpentine on basalt	subangular to subrounded chips up to 0.5 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- paleosol (Tvs)				
2,110 - 2,120	643.1 - 646.2	Paleosol and Basalt; very dark gray [5YR3/1] and red [10R4/6]; well lithified; 60% red paleosol of mudstone, scoria and brown sandstone, 40% black basalt, trace red clayey silt; reaction to acid: weak	abundant iron oxide staining (hematite), trace white gypsum on fracture surfaces of basalt	subangular to subrounded chips up to 0.8 cm
2,120 - 2,130	646.2 - 649.2	Paleosol; brown [7.5YR5/4]; well lithified; brown paleosol of siltstone and mudstone, trace black basalt, 5% brown silt; reaction to acid: moderate	trace iron oxide staining, trace calcite, trace white gypsum	subangular to subrounded chips up to 0.4 cm
2,130 - 2,140	649.2 - 652.3	Paleosol; brown [7.5YR5/4]; well lithified; brown paleosol of siltstone and mudstone, trace black basalt, 5% brown silt; reaction to acid: moderate	trace iron oxide staining, trace calcite, trace white gypsum	subangular to subrounded chips up to 0.4 cm
2,140 - 2,150	652.3 - 655.3	Paleosol and Basalt; brown [7.5YR5/4] and very dark gray [10YR3/1]; well lithified; 70% brown paleosol of siltstone and mudstone, trace red scoria, 30% black basalt, 5% of sample is brown silt; reaction to acid: weak	trace iron oxide staining, white gypsum on basalt, trace calcite	subangular to subrounded chips up to 0.7 cm
2,150 - 2,160	655.3 - 658.4	Paleosol and Basalt; brown [7.5YR5/4] and very dark gray [10YR3/1]; well lithified; 50% brown paleosol of siltstone and mudstone, trace red scoria, 50% black basalt, trace brown silt; reaction to acid: weak	trace iron oxide staining, white gypsum on basalt, trace calcite	subangular to subrounded chips up to 0.9 cm
TERTIARY VOLCANICS- basalt (Tvs)				
2,160 - 2,170	658.4 - 661.4	Basalt; dark brown [7.5YR3/2] and weak red [10R4/4]; well lithified; 90% brownish-black basalt, 10% red paleosol of siltstone and scoria; reaction to acid: very weak	some iron oxide staining (hematite)	subangular to subrounded chips up to 0.4 cm
2,170 - 2,180	661.4 - 664.5	Basalt; red [2.5YR4/6]; well lithified; 95% red paleosol of sandy siltstone and scoria, 5% black basalt, 5% of sample is red clayey silt; reaction to acid: weak to moderate	abundant iron oxide staining (hematite), calcite amygdules in scoria, white gypsum on basalt	subangular to subrounded chips up to 0.9 cm
TERTIARY VOLCANICS- paleosol and scoria (Tvs)				
2,180 - 2,190	664.5 - 667.5	Paleosol; red [2.5YR4/6]; well lithified; 95% red paleosol of sandy siltstone and scoria, 5% black basalt, 5% of sample is red clayey silt; reaction to acid: weak to moderate	abundant iron oxide staining (hematite), calcite amygdules in scoria, white gypsum on basalt	subangular to subrounded chips up to 0.5 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-04
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- paleosol and scoria (Tvs)				
2,190 - 2,200	667.5 - 670.6	Paleosol; red [2.5YR4/6]; well lithified; red paleosol of sandy siltstone and scoria, trace black basalt, 5% of sample is red clayey silt; reaction to acid: moderate	abundant iron oxide staining (hematite), calcite amygdules in scoria, white gypsum on basalt	subangular to subrounded chips up to 0.6 cm
2,200 - 2,210	670.6 - 673.6	Paleosol and Basalt; red [2.5YR4/6]; well lithified; 85% red paleosol of sandy siltstone, scoria, and brown siltstone, 15% black basalt, trace red clayey silt; reaction to acid: moderate	abundant iron oxide staining (hematite), calcite amygdules in scoria, white gypsum on basalt	subangular to subrounded chips up to 0.7 cm
2,210 - 2,220	673.6 - 676.7	Paleosol; red [2.5YR4/6]; well lithified; red paleosol of sandy siltstone, scoria, and brown siltstone, trace black basalt, 5% red clayey silt; reaction to acid: weak	abundant iron oxide staining (hematite), calcite amygdules in scoria, white gypsum on basalt	subangular to subrounded chips up to 0.3 cm
2,220 - 2,230	676.7 - 679.7	Paleosol; red [2.5YR4/6]; well lithified; red paleosol of sandy siltstone, scoria, and brown siltstone, trace black basalt, trace red clayey silt; reaction to acid: moderate	abundant iron oxide staining (hematite), calcite amygdules in scoria, white gypsum on basalt	subangular to subrounded chips up to 0.3 cm
2,230 - 2,240	679.7 - 682.8	Paleosol; red [2.5YR4/6]; well lithified; red paleosol of sandy siltstone, scoria, and brown siltstone, trace black basalt, trace red clayey silt; reaction to acid: weak	abundant iron oxide staining (hematite), white gypsum and calcite amygdules in scoria	subangular to subrounded chips up to 0.3 cm
2,240 - 2,250	682.8 - 685.8	Paleosol; red [2.5YR4/6]; well lithified; red paleosol of sandy siltstone, scoria, and brown siltstone, trace black basalt, trace red clayey silt; reaction to acid: weak	abundant iron oxide staining (hematite), white gypsum and calcite amygdules in scoria	subangular to subrounded chips up to 0.3 cm
2,250 - 2,260	685.8 - 688.8	Paleosol and Basalt; red [2.5YR4/6] and dark reddish gray [2.5YR3/1]; well lithified; 50% red paleosol of siltstone and scoria, 50% dark gray vesicular basalt, trace red clayey silt; reaction to acid: moderate	abundant iron oxide staining (hematite), calcite amygdules in scoria	subangular to subrounded chips up to 0.3 cm
2,260 - 2,270	688.8 - 691.9	Paleosol and Basalt; red [2.5YR4/6] and dark reddish gray [2.5YR3/1]; well lithified; 50% red paleosol of siltstone and scoria, 50% dark gray vesicular basalt, trace red clayey silt; reaction to acid: weak	abundant iron oxide staining (hematite), calcite amygdules in scoria	subangular to subrounded chips up to 0.3 cm
TERTIARY VOLCANICS- basalt (Tvs)				
2,270 - 2,280	691.9 - 694.9	Basalt and Scoria; dark reddish gray [2.5YR3/1]; well lithified; 80% dark gray basalt, 20% red scoria, trace red clayey silt; reaction to acid: weak	some iron oxide staining (hematite), trace white gypsum on basalt	subangular to subrounded chips up to 0.3 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- basalt (Tvs)				
2,280 - 2,290	694.9 - 698.0	NO SAMPLE		
2,290 - 2,300	698.0 - 701.0	Basalt; black [N2.5]; well lithified; black basalt, trace red scoria; reaction to acid: very weak	trace iron oxide staining (hematite), white gypsum	subangular to subrounded chips up to 1.3 cm
2,300 - 2,310	701.0 - 704.1	Basalt; dusky red [2.5YR3/2]; well lithified; dark purplish-black andesitic basalt, trace brown siltstone, trace purplish-black clayey silt; reaction to acid: strong	trace iron oxide staining, calcite	subangular to subrounded chips up to 1.0 cm
2,310 - 2,320	704.1 - 707.1	Basalt; dusky red [2.5YR3/2]; well lithified; dark purplish-black andesitic basalt, trace brown siltstone, trace purplish-black clayey silt; reaction to acid: very weak	trace iron oxide staining, calcite	subangular to subrounded chips up to 1.0 cm
2,320 - 2,330	707.1 - 710.2	Basalt; dusky red [2.5YR3/2]; well lithified; dark purplish-black andesitic basalt, trace brown siltstone, trace purplish-black clayey silt; reaction to acid: weak to moderate	trace iron oxide staining, calcite	subangular to subrounded chips up to 0.6 cm
2,330 - 2,340	710.2 - 713.2	Basalt; reddish black [2.5YR2.5/1]; well lithified; 60% black basalt, 40% purplish-black andesite basalt; reaction to acid: weak	trace iron oxide staining, trace green serpentine on fracture surfaces	subangular to subrounded chips up to 2.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
0 - 20	0.0 - 6.1	Clast-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; silty sandy gravel; cut chips are clasts of pink, orange, brown, white and green quartzite, silvery schist, black, white and green diabase, light gray aphanitic felsic tuff, black and purple basalt, and very trace matrix chips of brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: very weak	common iron oxide staining (hematite and limonite), trace calcite	CONVENTIONAL AIR ROTARY; Munsell Color Version: 2000 revised edition; subangular to subrounded chips up to 3.1 cm; Drillers sampled at strange intervals from 0-300 feet
20 - 24	6.1 - 7.3	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 90% clasts of pink, orange, brown, white and green quartzite, silvery schist, black, white and green diabase, light gray aphanitic felsic tuff, black and purple basalt, and 10% matrix chips of brown silty sandstone; overall sample is 19% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite), trace calcite	CONVENTIONAL MUD ROTARY; subangular to subrounded chips up to 0.5 cm
24 - 50	7.3 - 15.2	Matrix-supported conglomerate; light brownish gray [2.5Y6/2]; weakly to moderately lithified; silty gravelly sand; cut chips are 90% clasts of pink, orange, brown, white and green quartzite, silvery schist, black, white and green diabase, light gray aphanitic felsic tuff, black and purple basalt, pink dacite tuff (Tal?), and 10% matrix chips of brown silty sandstone; overall sample is 24% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 0.5 cm
50 - 78	15.2 - 23.8	Matrix-supported conglomerate; light brownish gray [2.5Y6/2]; weakly to moderately lithified; silty gravelly sand; cut chips are 70% clasts of pink, orange, brown, white and green quartzite, silvery schist, black, white and green diabase, light gray aphanitic felsic tuff, black and purple basalt, pink dacite tuff (Tal?), and 30% matrix chips of brown silty sandstone; overall sample is 44% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 0.7 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
84 - 98	25.6 - 29.9	Matrix-supported conglomerate; light olive brown [2.5Y5/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 70% clasts of pink, orange, brown, white and green quartzite, silvery schist, black, white and green diabase, light gray aphanitic felsic tuff, more black and purple basalt, pink dacite tuff (Tal?), trace gray limestone, and 30% matrix chips of brown silty sandstone; overall sample is 44% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.6 cm
98 - 116	29.9 - 35.4	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are 60% matrix chips of brown silty sandstone, 40% clasts of brown, green and orange quartzite, black basalt, black, white and green diabase, silvery schist, light gray and brown felsic banded tuff; overall sample is 72% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
116 - 136	35.4 - 41.5	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly silty sand; cut chips are 50% matrix chips of brown silty sandstone, 50% clasts of brown, green and orange quartzite, black basalt, black, white and green diabase, silvery schist, light gray and brown felsic banded tuff; overall sample is 65% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
136 - 156	41.5 - 47.5	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 40% matrix chips of brown silty sandstone, 60% clasts of brown, green and orange quartzite, black basalt, black, white and green diabase, silvery schist, light gray and brown felsic banded tuff, white anhydrite, clear vein quartz, and pink limestone with epidote; overall sample is 58% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 3.7 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
156 - 174	47.5 - 53.0	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 10% matrix chips of brown silty sandstone, 90% clasts of brown, green and orange quartzite, black basalt with trace magnetite, black, white and green diabase, silvery schist, light gray and brown felsic banded tuff, white anhydrite, clear vein quartz, and pink limestone with epidote; overall sample is 37% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm; some silt balls
174 - 194	53.0 - 59.1	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 20% matrix chips of brown silty sandstone, 80% clasts of brown, green and orange quartzite, black basalt with trace magnetite, black, white and green diabase, silvery schist, light gray and brown felsic banded tuff, white anhydrite, clear vein quartz, and pink limestone with epidote; overall sample is 36% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
194 - 214	59.1 - 65.2	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 20% matrix chips of brown silty sandstone, 80% clasts of brown, green and orange quartzite, black basalt with trace magnetite, black, white and green diabase, silvery schist, light gray and brown felsic banded tuff, white anhydrite, clear vein quartz, and pink limestone with epidote; overall sample is 36% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
214 - 237	65.2 - 72.2	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 5% matrix chips of brown silty sandstone, 95% clasts of brown, green and orange quartzite with trace epidote, black basalt with trace magnetite, black, white and green diabase, silvery schist, light gray and brown felsic banded tuff, white anhydrite, clear vein quartz, trace limestone, and trace calcite; overall sample is 24% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
237 - 257	72.2 - 78.3	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 10% matrix chips of brown silty sandstone, 90% clasts of brown, green and orange quartzite with trace epidote, black basalt with trace magnetite, black, white and green diabase, silvery schist, light gray and brown felsic banded tuff, trace white anhydrite, clear vein quartz, trace limestone, and trace calcite; overall sample is 28% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
257 - 277	78.3 - 84.4	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 10% matrix chips of brown silty sandstone, 90% clasts of brown, green and orange quartzite with trace epidote, black basalt with trace magnetite, black, white and green diabase, silvery schist, light gray and brown felsic banded tuff, trace white anhydrite, clear vein quartz, trace limestone, and trace calcite; overall sample is 19% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
277 - 297	84.4 - 90.5	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 98% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite with trace epidote, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, and 2% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 12% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm
297 - 317	90.5 - 96.6	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite with trace epidote, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 24% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
300 - 310	91.4 - 94.5	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite with trace epidote, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 24% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
310 - 320	94.5 - 97.5	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 95% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite with trace epidote, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, and 5% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 10% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
320 - 330	97.5 - 100.6	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 95% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite with trace epidote, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, and 5% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
330 - 340	100.6 - 103.6	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 95% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, and 5% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 10% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
340 - 350	103.6 - 106.7	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 95% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, and 5% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
350 - 360	106.7 - 109.7	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 98% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, and 2% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 12% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
360 - 370	109.7 - 112.8	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 98% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, and 2% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 12% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
370 - 380	112.8 - 115.8	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 98% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, and 2% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 12% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
380 - 390	115.8 - 118.9	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 98% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, trace epidote, and 2% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 7% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm
390 - 400	118.9 - 121.9	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 98% clasts of black basalt with trace magnetite, black, white and green diabase, white, brown, orange and green quartzite, red chert, light gray aphanitic felsic tuff, trace silvery schist, trace gray limestone, trace vein quartz, trace calcite, trace epidote, and 2% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 10% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm
400 - 410	121.9 - 125.0	Matrix-supported conglomerate; light yellowish brown [2.5Y6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown green, orange and white quartzite, silvery schist, pinkish-gray limestone, vein quartz, pink and orange tuff (Tal), red chert, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
410 - 420	125.0 - 128.0	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown green, orange and white quartzite, silvery schist, pinkish-gray limestone, vein quartz, pink and orange tuff (Tal), red chert, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
420 - 430	128.0 - 131.1	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
430 - 440	131.1 - 134.1	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
440 - 450	134.1 - 137.2	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, light gray and brown felsic banded tuff, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
450 - 460	137.2 - 140.2	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, and trace matrix chips of brown silty sandstone and silt balls; overall sample is 2% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm
460 - 470	140.2 - 143.3	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, trace oolitic limestone, and trace matrix chips of brown silty sandstone and silt balls; overall sample is 2% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
470 - 480	143.3 - 146.3	Clast-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; gravel; cut chips are clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, and trace matrix chips of brown silty sandstone and silt balls; overall sample is 2% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm; mostly large chips
480 - 490	146.3 - 149.4	Clast-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; gravel; cut chips are 95% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, and 5% matrix chips of brown silty sandstone and silt balls; overall sample is 10% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm; mostly large chips

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
490 - 500	149.4 - 152.4	Clast-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; silty sandy gravel; cut chips are 85% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, and 15% matrix chips of brown silty sandstone and silt balls; overall sample is 21% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm; mostly large chips
500 - 510	152.4 - 155.4	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
510 - 520	155.4 - 158.5	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
520 - 530	158.5 - 161.5	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
530 - 540	161.5 - 164.6	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
540 - 550	164.6 - 167.6	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, trace white anhydrite, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
550 - 560	167.6 - 170.7	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white and green diabase, brown, orange and green quartzite, white limestone, vein quartz, red chert, pink and orange tuff (Tal), silvery schist, trace white anhydrite, and 10% matrix chips of brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
560 - 570	170.7 - 173.7	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray limestone, silvery schist, yellow and white vein quartz, orange chert, pink and orange tuff (Tal), and 10% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 14% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
570 - 580	173.7 - 176.8	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 60% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), and 40% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 43% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
580 - 590	176.8 - 179.8	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 75% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), and 25% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 29% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
590 - 600	179.8 - 182.9	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 75% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), and 25% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 29% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
600 - 610	182.9 - 185.9	Clast-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; gravel; cut chips are 90% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray and pink limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), trace calcite, and 10% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 14% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm; mostly large chips
610 - 620	185.9 - 189.0	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray and pink limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), trace calcite, and 10% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 19% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm
620 - 630	189.0 - 192.0	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray and pink limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), trace calcite, and 10% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 14% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
630 - 640	192.0 - 195.1	Clast-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; silty sandy gravel; cut chips are 80% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray and pink limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), trace calcite, and 20% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 24% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm; mostly large chips
640 - 650	195.1 - 198.1	Clast-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; silty sandy gravel; cut chips are 75% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray and pink limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), trace calcite, and 25% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 29% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm; mostly large chips
650 - 660	198.1 - 201.2	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray and pink limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), trace calcite, and 10% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 19% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
660 - 670	201.2 - 204.2	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; gravelly silty sand; cut chips are 40% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray and pink limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), trace calcite, and 60% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 62% fines and matrix chips; reaction to acid: moderate to strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.1 cm; mostly large chips
670 - 680	204.2 - 207.3	Clast-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; silty sandy gravel; cut chips are 60% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray and pink limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), trace calcite, and 40% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 43% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm; mostly large chips
680 - 690	207.3 - 210.3	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 70% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray and pink limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), trace calcite, and 30% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 40% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
690 - 700	210.3 - 213.4	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 70% clasts of black basalt with trace magnetite, black, white, green and red diabase, brown, red, orange, green and white quartzite, gray and pink limestone, silvery schist, yellow and white vein quartz, orange and gray chert, pink and orange tuff (Tal), trace calcite, and 30% matrix chips of easily broken brown silty sandstone, silt balls and trace pasty white gypsum; overall sample is 33% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm; mostly large chips
700 - 710	213.4 - 216.4	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite); slickensides on 1 chip	subangular to subrounded chips up to 1.5 cm
710 - 720	216.4 - 219.5	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
720 - 730	219.5 - 222.5	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
730 - 740	222.5 - 225.6	Clast-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; gravel; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.8 cm; mostly large chips
740 - 750	225.6 - 228.6	Clast-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; gravel; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.8 cm; mostly large chips
750 - 760	228.6 - 231.6	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: moderate to strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
760 - 770	231.6 - 234.7	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 85% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 15% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 3.2 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
770 - 780	234.7 - 237.7	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm
780 - 790	237.7 - 240.8	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 18% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite); trace slickensides	subangular to subrounded chips up to 1.7 cm
790 - 800	240.8 - 243.8	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.9 cm
800 - 810	243.8 - 246.9	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite), slickensides on 1 chip	subangular to subrounded chips up to 1.4 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
810 - 820	246.9 - 249.9	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; silty gravelly sand; cut chips are 75% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 25% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 32% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm
820 - 830	249.9 - 253.0	Clast-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravel; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm; mostly large chips
830 - 840	253.0 - 256.0	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% black basalt, black, white and green diabase, pink and orange tuff (Tal), white, brown, red, green and orange quartzite, orange chert, silvery schist, gray limestone, light gray and brown banded tuff, and 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm
840 - 850	256.0 - 259.1	Clast-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; silty sandy gravel; cut chips are 50% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 50% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 52% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm; mostly large chips

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
850 - 860	259.1 - 262.1	Clast-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravel; cut chips are 85% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 15% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm; mostly large chips
860 - 870	262.1 - 265.2	Matrix-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are 85% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 15% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm
870 - 880	265.2 - 268.2	Clast-supported conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravel; cut chips are 85% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 15% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm; mostly large chips
880 - 890	268.2 - 271.3	Clast-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravel; cut chips are 85% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 15% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm; mostly large chips

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
890 - 900	271.3 - 274.3	Clast-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravel; cut chips are 85% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 15% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 19% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm; mostly large chips
900 - 910	274.3 - 277.4	Clast-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; silty sandy gravel; cut chips are 50% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 50% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 52% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm; mostly large chips
910 - 920	277.4 - 280.4	Matrix-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are 30% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 70% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 71% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm; mostly large chips
920 - 930	280.4 - 283.5	Matrix-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly silty sand; cut chips are 45% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 55% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 57% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
930 - 940	283.5 - 286.5	Matrix-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; silty gravelly sand; cut chips are 50% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 50% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 52% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
940 - 950	286.5 - 289.6	Matrix-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; silty gravelly sand; cut chips are 60% clasts of black basalt, black, white, green and red diabase, brown, orange and red quartzite, red chert, light gray limestone, white calcite, 40% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 49% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm
950 - 960	289.6 - 292.6	Matrix-supported conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; silty gravelly sand; cut chips are 90% clasts of black basalt, black, white, green and red diabase, pinkish-orange tuff (Tal), brown, orange and red quartzite, light gray and brown banded tuff, silvery schist, red chert, vein quartz, trace anhydrite, 10% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 14% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
960 - 970	292.6 - 295.7	Matrix-supported conglomerate; light brown [7.5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are 30% clasts of black basalt, black, white, green and red diabase, pinkish-orange tuff (Tal), brown, orange and red quartzite, light gray and brown banded tuff, silvery schist, red chert, trace vein quartz, gray limestone, and 70% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 73% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
970 - 980	295.7 - 298.7	Matrix-supported conglomerate; light brown [7.5YR6/4]; weakly to moderately lithified; gravelly silty sand; cut chips are 30% clasts of black basalt, black, white, green and red diabase, pinkish-orange tuff (Tal), brown, orange and red quartzite, light gray and brown banded tuff, silvery schist, red chert, trace vein quartz, and 70% matrix chips of easily broken brown silty sandstone and silt balls; overall sample is 71% fines and matrix chips; reaction to acid: weak to moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm; mostly large chips
980 - 990	298.7 - 301.8	Matrix-supported conglomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly clayey silt; cut chips are 50% clasts of black basalt, black, white and green diabase, brown, red and orange quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), 50% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 57% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm
990 - 1,000	301.8 - 304.8	Matrix-supported conglomerate; light brown [7.5YR6/4]; weakly to moderately lithified; gravelly clayey silt; cut chips are 35% clasts of black basalt, black, white and green diabase, brown, red and orange quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), 65% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 70% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm
1,000 - 1,010	304.8 - 307.8	Matrix-supported conglomerate; light brown [7.5YR6/4]; weakly to moderately lithified; clayey silt; cut chips are 5% clasts of black basalt, black, white and green diabase, brown, red, orange and white quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), 95% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 96% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,010 - 1,020	307.8 - 310.9	Matrix-supported conglomerate; pink [7.5YR7/3]; weakly to moderately lithified; gravelly clayey silt; cut chips are 30% clasts of black basalt, black, white and green diabase, brown, red, orange and white quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), grayish-pink limestone, and 70% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 80% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
1,020 - 1,030	310.9 - 313.9	Matrix-supported conglomerate; very pale brown [10YR7/4]; weakly to moderately lithified; clayey silt; cut chips are 20% clasts of black basalt, black, white and green diabase, brown, red, orange and white quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), grayish-pink limestone, and 80% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 88% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
1,030 - 1,040	313.9 - 317.0	Matrix-supported conglomerate; very pale brown [10YR7/4]; weakly to moderately lithified; gravelly clayey silt; cut chips are 30% clasts of black basalt, black, white and green diabase, brown, red, orange and white quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), grayish-pink limestone, and 70% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 82% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
1,040 - 1,050	317.0 - 320.0	Matrix-supported conglomerate; very pale brown [10YR7/4]; weakly to moderately lithified; gravelly clayey silt; cut chips are 35% clasts of black basalt, black, white and green diabase, brown, red, orange and white quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), grayish-pink limestone, and 65% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 79% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,050 - 1,060	320.0 - 323.1	Matrix-supported conglomerate; light brown [7.5YR6/4]; weakly to moderately lithified; clayey silt; cut chips are 15% clasts of black basalt, black, white and green diabase, brown, red, orange and white quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), grayish-pink limestone, and 85% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 89% fines and matrix chips; reaction to acid: weak to moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.4 cm
1,060 - 1,070	323.1 - 326.1	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; clayey silt; cut chips are 15% clasts of black basalt, black, white and green diabase, brown, red, orange and white quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), grayish-pink limestone, and 85% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 89% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
1,070 - 1,080	326.1 - 329.2	Matrix-supported conglomerate; pale brown [10YR6/3]; weakly to moderately lithified; clayey silt; cut chips are 5% clasts of black basalt, black, white and green diabase, brown, red, orange and white quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), grayish-pink limestone, and 95% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 98% fines and matrix chips; reaction to acid: weak to moderate	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
1,080 - 1,090	329.2 - 332.2	Matrix-supported conglomerate; brown [10YR5/4]; weakly to moderately lithified; clayey silt; cut chips are 2% clasts of black basalt, black, white and green diabase, brown, red, orange and white quartzite, light gray and brown banded tuff, vein quartz, pinkish-orange tuff (Tal), grayish-pink limestone, and 98% matrix chips of brown siltstone with some clay and trace white pasty gypsum; overall sample is 99% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.4 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,090 - 1,100	332.2 - 335.3	Matrix-supported conglomerate; brown [10YR5/3]; weakly to moderately lithified; clayey silt; cut chips are 90% matrix chips of easily broken brown siltstone with some clay, 8% black basalt, 2% clasts of orange chert, brown and red quartzite, silvery schist; overall sample is 94% fines and matrix chips; reaction to acid: moderate	trace iron oxide staining (hematite and limonite), vein quartz and calcite on basalt, trace euhedral quartz crystals (open fractures)	subangular to subrounded chips up to 0.8 cm
TERTIARY VOLCANICS- basalt (Tvs)				
1,100 - 1,110	335.3 - 338.3	Basalt; light brown [7.5YR6/4]; well lithified; 95% black basalt, 5% Gila matrix balls, trace silvery schist, trace brown and green quartzite; reaction to acid: weak	trace iron oxide staining (hematite) on fracture surfaces; some slickensides; white gypsum and green serpentine on fracture surfaces and in sample	subangular to subrounded chips up to 0.5 cm; 10% fines probably from Gila
1,110 - 1,120	338.3 - 341.4	Basalt; light brown [7.5YR6/4]; well lithified; black basalt, 10% Gila matrix balls, trace silvery schist, trace brown and red quartzite, trace red limestone; reaction to acid: weak	trace iron oxide staining (hematite), white gypsum and green serpentine on fractures, trace calcite	subangular to subrounded chips up to 0.6 cm; 15% fines probably from Gila
1,120 - 1,130	341.4 - 344.4	Basalt; light brown [7.5YR6/4]; well lithified; 98% black basalt, 2% Gila matrix balls, trace silvery schist, trace brown and red quartzite, trace red limestone, trace pinkish-orange tuff (Tal); reaction to acid: weak	trace iron oxide staining (hematite) on fracture surfaces, white gypsum and green serpentine on fractures, trace calcite	subangular to subrounded chips up to 1.2 cm; 7% fines probably from Gila
1,130 - 1,140	344.4 - 347.5	Basalt; light brown [7.5YR6/4]; well lithified; black basalt, trace Gila matrix balls, trace brown mudstone, trace silvery schist, trace brown and red quartzite, trace red limestone, trace pinkish-orange tuff (Tal); reaction to acid: moderate	trace iron oxide staining (hematite) on fracture surfaces, white gypsum and green serpentine on fractures, trace calcite	REVERSE CIRCULATION AIR PERCUSSION; subangular to subrounded chips up to 1.7 cm; 5% fines probably from Gila
1,140 - 1,150	347.5 - 350.5	Basalt; black [N2.5]; well lithified; 95% black basalt, 5% brown sandy mudstone chips, trace green and black diabase, trace green quartzite; reaction to acid: no	trace iron oxide staining (hematite) on fracture surfaces, white gypsum and green serpentine on fractures, trace calcite	subangular to subrounded chips up to 1.8 cm; no fines; mostly large chips
1,150 - 1,160	350.5 - 353.6	Basalt; black [N2.5]; well lithified; 95% black basalt, 5% brown sandy mudstone chips, trace brown quartzite; reaction to acid: no	trace iron oxide staining (hematite) on fracture surfaces, white gypsum and green serpentine on fractures, trace calcite	subangular to subrounded chips up to 1.8 cm; no fines; mostly large chips; trace cement in cuttings

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- basalt (Tvs)				
1,160 - 1,170	353.6 - 356.6	Basalt; black [N2.5]; well lithified; black basalt, trace brown quartzite; reaction to acid: no	trace iron oxide staining (hematite) speckling and on fracture surfaces; trace slickensides, white gypsum and green serpentine on fractures, trace calcite	subangular to subrounded chips up to 1.8 cm; no fines; mostly large chips
1,170 - 1,180	356.6 - 359.7	Basalt; black [N2.5]; well lithified; black basalt, trace brown quartzite; reaction to acid: no	trace iron oxide staining (hematite) speckling and on fracture surfaces, white gypsum and green serpentine on fractures, trace calcite	subangular to subrounded chips up to 0.5 cm; trace fines
1,180 - 1,190	359.7 - 362.7	Basalt; black [N2.5]; well lithified; black basalt, trace brown quartzite; reaction to acid: no	trace iron oxide staining (hematite) speckling and on fracture surfaces, white gypsum and green serpentine on fractures, trace calcite	subangular to subrounded chips up to 2.6 cm; trace fines; mostly larger chips
1,190 - 1,200	362.7 - 365.8	Basalt; black [N2.5]; well lithified; black basalt, trace brown quartzite; reaction to acid: no	trace iron oxide staining (hematite) speckling and on fracture surfaces; trace slickensides, white gypsum and green serpentine on fractures, trace calcite	subangular to subrounded chips up to 2.1 cm; trace fines; mostly larger chips
1,200 - 1,210	365.8 - 368.8	Basalt; black [N2.5]; well lithified; black basalt, trace brown quartzite; reaction to acid: very weak	trace iron oxide staining (hematite) speckling and on fracture surfaces, white gypsum and green serpentine on fractures, trace calcite	subangular to subrounded chips up to 0.4 cm; trace fines
1,210 - 1,220	368.8 - 371.9	Basalt; red [10R5/6]; well lithified; 95% black and dark purplish-brown basalt with red hematite speckling, 5% red paleosol of baked mudstone and sandstone; reaction to acid: very weak	some iron oxide staining (hematite), white gypsum and green serpentine on fractures of basalt, trace calcite	subangular to subrounded chips up to 1.3 cm; 5% red fines
TERTIARY VOLCANICS- paleosol and basalt (Tvs)				
1,220 - 1,230	371.9 - 374.9	Basalt and paleosol; red [10R5/6]; well lithified; 60% black and dark purplish-brown basalt with red hematite speckling, 40% red paleosol of baked mudstone and sandstone; reaction to acid: very weak	common iron oxide staining (hematite and trace limonite), white gypsum and green serpentine on fractures of basalt, trace calcite	subangular to subrounded chips up to 1.0 cm; 5% red clayey silt

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- paleosol and basalt (Tvs)				
1,230 - 1,240	374.9 - 378.0	Paleosol and basalt; red [2.5YR5/6]; well lithified; 55% red paleosol of baked mudstone and sandstone, 45% black and dark purplish-brown basalt with red hematite speckling; reaction to acid: very weak	abundant iron oxide staining (hematite and trace limonite), white gypsum and green serpentine on fractures of basalt, trace calcite	subangular to subrounded chips up to 1.0 cm; 5% red clayey silt
1,240 - 1,250	378.0 - 381.0	Paleosol and basalt; yellowish red [5YR5/6]; well lithified; 65% red paleosol of baked sandstone and mudstone with red amygdaloidal scoria, 30% black and brown basalt; reaction to acid: very weak	abundant iron oxide staining (hematite and trace limonite) in paleosol and some on fracture surfaces, 5% white gypsum	subangular to subrounded chips up to 1.0 cm; 5% red clayey silt
1,250 - 1,260	381.0 - 384.0	Basalt and paleosol; reddish brown [2.5YR5/4]; well lithified; 80% black and brown vesicular basalt, 15% red paleosol of baked sandstone and mudstone with red amygdaloidal scoria; reaction to acid: very weak	common iron oxide staining (hematite and trace limonite), 5% white gypsum	subangular to subrounded chips up to 1.0 cm; 2% red clayey silt
TERTIARY VOLCANICS- basalt (Tvs)				
1,260 - 1,270	384.0 - 387.1	Basalt; reddish brown [2.5YR5/4]; well lithified; 90% black and brown vesicular basalt, 5% red paleosol of baked sandstone and mudstone with red amygdaloidal scoria; reaction to acid: very weak	common iron oxide staining (hematite and trace limonite), 5% white gypsum and green serpentine	subangular to subrounded chips up to 1.0 cm; 2% red clayey silt
1,270 - 1,280	387.1 - 390.1	Basalt; reddish brown [2.5YR5/4]; well lithified; black and brown vesicular basalt with quartz and plagioclase amygdules, trace red paleosol of baked mudstone; reaction to acid: very weak	some iron oxide staining (hematite), white gypsum and green serpentine on fractures of basalt	subangular to subrounded chips up to 1.2 cm; 2% red clayey silt
1,280 - 1,290	390.1 - 393.2	Basalt; weak red [2.5YR4/2]; well lithified; black and brown vesicular basalt with quartz and plagioclase amygdules, trace red paleosol of baked mudstone; reaction to acid: very weak	some iron oxide staining (hematite), white gypsum and green serpentine on fractures of basalt	subangular to subrounded chips up to 1.2 cm; trace red clayey silt
1,290 - 1,300	393.2 - 396.2	Basalt; reddish brown [2.5YR4/3]; well lithified; black and brown vesicular basalt with quartz and plagioclase amygdules, trace red paleosol of baked mudstone; reaction to acid: very weak	some iron oxide staining (hematite), white gypsum and green serpentine on fractures of basalt	subangular to subrounded chips up to 0.7 cm; 2% red clayey silt
1,300 - 1,310	396.2 - 399.3	Basalt; dark reddish gray [2.5YR4/1]; well lithified; 90% black and brown vesicular basalt with quartz and plagioclase amygdules, trace red paleosol of baked mudstone; reaction to acid: very weak	some iron oxide staining (hematite), 10% white gypsum and green serpentine	subangular to subrounded chips up to 2.5 cm; trace red clayey silt

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- basalt (Tvs)				
1,310 - 1,320	399.3 - 402.3	Basalt; weak red [2.5YR4/2]; well lithified; 90% black and brown vesicular basalt with quartz and plagioclase amygdules, trace red paleosol of baked mudstone; reaction to acid: very weak	some iron oxide staining (hematite), 10% white gypsum and green serpentine	subangular to subrounded chips up to 0.5 cm; trace red clayey silt
1,320 - 1,330	402.3 - 405.4	Basalt; reddish brown [2.5YR4/4]; well lithified; black, brown and red vesicular basalt and scoria with olivine; reaction to acid: very weak	some iron oxide staining (hematite) speckling, abundant amygdules of white gypsum and green serpentine	subangular to subrounded chips up to 3.0 cm; trace red clayey silt
1,330 - 1,340	405.4 - 408.4	Basalt; reddish brown [2.5YR4/4]; well lithified; 95% black and brown vesicular basalt and scoria with quartz and plagioclase amygdules, trace red paleosol of baked mudstone; reaction to acid: very weak	common iron oxide staining (hematite), 5% white gypsum and green serpentine	subangular to subrounded chips up to 1.5 cm; 2% red clayey silt
1,340 - 1,350	408.4 - 411.5	Basalt; reddish black [2.5YR2.5/1]; well lithified; brown vesicular basalt and scoria; reaction to acid: very weak	some iron oxide staining (hematite), white and yellow gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.4 cm; very trace red clayey silt
1,350 - 1,360	411.5 - 414.5	Basalt; reddish brown [2.5YR4/1]; well lithified; brown vesicular basalt and scoria; reaction to acid: very weak	trace iron oxide staining (hematite), white and yellow gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 0.4 cm; trace red clayey silt
1,360 - 1,370	414.5 - 417.6	Basalt; reddish black [2.5YR2.5/1]; well lithified; brown, black, yellow and red vesicular basalt and scoria; reaction to acid: no	some iron oxide staining (hematite and limonite), white gypsum and green serpentine in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.3 cm; trace red clayey silt
1,370 - 1,380	417.6 - 420.6	Basalt; black [N2.5] and reddish brown [2.5YR4/4]; well lithified; black, brown, red and yellow vesicular basalt and scoria, trace red paleosol of baked mudstone; reaction to acid: no	some iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.6 cm; trace red clayey silt
1,380 - 1,390	420.6 - 423.7	Basalt; reddish brown [2.5YR4/4]; well lithified; black, brown, red and yellow vesicular basalt and scoria; reaction to acid: no	abundant iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 0.8 cm; trace red clayey silt

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- basalt (Tvs)				
1,390 - 1,400	423.7 - 426.7	Basalt; reddish brown [2.5YR4/4]; well lithified; black, brown, red and yellow vesicular basalt and scoria; reaction to acid: very weak	abundant iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces, trace clear calcite	subangular to subrounded chips up to 0.8 cm; 2% red clayey silt
1,400 - 1,410	426.7 - 429.8	Basalt; reddish brown [2.5YR4/4]; well lithified; black, brown, red and yellow vesicular basalt and scoria; reaction to acid: no	common iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.6 cm; trace red clayey silt
1,410 - 1,420	429.8 - 432.8	Basalt; dark reddish gray [2.5YR3/1]; well lithified; black, brown, red and yellow vesicular basalt and scoria; reaction to acid: very weak	some iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.4 cm; trace red clayey silt
1,420 - 1,430	432.8 - 435.9	Basalt; dark reddish gray [2.5YR3/1]; well lithified; black, brown, red and yellow vesicular basalt and scoria, trace yellow mudstone; reaction to acid: no	some iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.7 cm; trace red clayey silt
1,430 - 1,440	435.9 - 438.9	Basalt; red [2.5YR4/6]; well lithified; 95% black, brown, red and yellow vesicular basalt and scoria, 5% yellow mudstone; reaction to acid: very weak	abundant iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.5 cm; 2% red clayey silt
1,440 - 1,450	438.9 - 442.0	Basalt; reddish brown [2.5YR4/4]; well lithified; 95% black, brown, red and yellow vesicular basalt and scoria, 5% yellow mudstone; reaction to acid: no	common iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.8 cm; trace red clayey silt
1,450 - 1,460	442.0 - 445.0	Basalt; dark reddish gray [2.5YR3/1]; well lithified; 95% black, brown, red and yellow vesicular basalt and scoria, 5% yellow mudstone; reaction to acid: no to very weak	some iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.2 cm; trace red clayey silt
1,460 - 1,470	445.0 - 448.1	Basalt; dark reddish gray [2.5YR3/1]; well lithified; 95% black, brown, red and yellow vesicular basalt and scoria, 5% yellow mudstone; reaction to acid: no to very weak	some iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.2 cm; trace red clayey silt
1,470 - 1,480	448.1 - 451.1	Basalt; reddish brown [2.5YR5/4]; well lithified; black, brown, red and yellow vesicular basalt and scoria; reaction to acid: no to very weak	common iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 2.4 cm; 2% red clayey silt

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- basalt (Tvs)				
1,480 - 1,490	451.1 - 454.2	Basalt; dark reddish gray [2.5YR3/1]; well lithified; black, brown, red and yellow vesicular basalt and scoria, trace yellow mudstone; reaction to acid: no to very weak	some iron oxide staining (hematite and limonite), white gypsum in amygdules and on fracture surfaces	subangular to subrounded chips up to 1.8 cm; trace red clayey silt
1,490 - 1,500	454.2 - 457.2	Basalt; reddish black [2.5YR2.5/1]; well lithified; black basalt, trace red paleosol of baked sandstone; reaction to acid: very weak	some iron oxide staining (hematite and limonite), trace white gypsum on fracture surfaces	subangular to subrounded chips up to 1.9 cm; trace red clayey silt
1,500 - 1,510	457.2 - 460.2	Basalt; dark reddish gray [2.5YR3/1]; well lithified; black basalt, trace orange and brown sandstone and quartzite; reaction to acid: very weak	trace iron oxide staining (hematite) speckling and on fracture surfaces, slickensides and calcite on 1 chip	subangular to subrounded chips up to 1.5 cm; trace brown silt on cuttings
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,510 - 1,520	460.2 - 463.3	Schist-rich conglomerate; reddish brown [5YR5/4], very dark gray [5YR3/1], and yellowish red [5YR5/8], bluish gray [5PB5/1], and white [N8]; weakly to moderately lithified; gravelly sand; cut chips are 95% clasts of silvery schist, black, white and green diabase, orange, brown, red and green quartzite, pink and orange chert, black and red basalt, vein quartz, light gray and brown banded tuff, pinkish-orange tuff, trace epidote, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.7 cm
1,520 - 1,530	463.3 - 466.3	Schist-rich conglomerate; reddish brown [5YR5/4], very dark gray [5YR3/1], and yellowish red [5YR5/8], bluish gray [5PB5/1], and white [N8]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, black, white and green diabase, orange, brown, red and green quartzite, pink and orange chert, black and red basalt, vein quartz, light gray and brown banded tuff, pinkish-orange tuff, light pink and beige rhyolitic tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,530 - 1,540	466.3 - 469.4	Schist-rich conglomerate; reddish brown [5YR5/4], very dark gray [5YR3/1], and yellowish red [5YR5/8], bluish gray [5PB5/1], and white [N8]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, black, white and green diabase, orange, brown, red and green quartzite, pink and orange chert, black and red basalt, vein quartz, light gray and brown banded tuff, pinkish-orange tuff, red and gray limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite), trace dendritic manganese oxide on limestone fragment, trace calcite	subangular to subrounded chips up to 1.7 cm
1,540 - 1,560	469.4 - 475.5	Schist-rich conglomerate; reddish brown [5YR5/4], very dark gray [5YR3/1], and yellowish red [5YR5/8], bluish gray [5PB5/1], and white [N8]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, black, white and green diabase, orange, brown, red and green quartzite, pink and orange chert, black and red basalt, vein quartz, light gray and brown banded tuff, pinkish-orange tuff, red and gray limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.7 cm; samples 1540-1550 & 1550-1560 were combined as 1540-1560'
1,560 - 1,570	475.5 - 478.5	Schist-rich conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, red, green and brown quartzite, silvery schist, black and green diabase, orange chert, vein quartz, light gray felsic tuff, black basalt, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.4 cm
1,570 - 1,580	478.5 - 481.6	Schist-rich conglomerate; black [N2.5], very dark gray [5YR3/1], and bluish gray [5PB5/1], white [N8], and weak red [10R4/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, red, green and brown quartzite, silvery schist, black and green diabase, orange chert, vein quartz, light gray felsic tuff, black basalt, gray and red limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 3.3 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,580 - 1,590	481.6 - 484.6	Schist-rich conglomerate; black [N2.5], very dark gray [5YR3/1], and bluish gray [5PB5/1], white [N8], and weak red [10R4/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, red, green and brown quartzite, silvery schist, black and green diabase, orange chert, vein quartz, light gray felsic tuff, black basalt, gray and red limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: very weak	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.4 cm
1,590 - 1,600	484.6 - 487.7	Schist-rich conglomerate; black [N2.5], very dark gray [5YR3/1], and bluish gray [5PB5/1], white [N8], and weak red [10R4/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, red, green and brown quartzite, silvery schist, black and green diabase, orange chert, vein quartz, light gray felsic tuff, black basalt, gray and red limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: very weak	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.7 cm
1,600 - 1,610	487.7 - 490.7	Schist-rich conglomerate; black [N2.5], very dark gray [5YR3/1], and bluish gray [5PB5/1], white [N8], and weak red [10R4/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, red, green and brown quartzite, silvery schist, black and green diabase, orange chert, vein quartz, light gray felsic tuff, black basalt, gray and red limestone, trace beige, light pink and yellow rhyolitic tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: very weak	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.7 cm
1,610 - 1,620	490.7 - 493.8	Schist-rich conglomerate; black [N2.5], very dark gray [5YR3/1], and bluish gray [5PB5/1], white [N8], and weak red [10R4/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, red, green and brown quartzite, silvery schist, black and green diabase, orange chert, vein quartz, light gray felsic tuff, black basalt, gray and red limestone, trace beige, light pink and yellow rhyolitic tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: very weak	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.5 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- mixed lithologies (QTg)				
1,620 - 1,630	493.8 - 496.8	Schist-rich conglomerate; black [N2.5], very dark gray [5YR3/1], and bluish gray [5PB5/1], white [N8], and weak red [10R4/4]; weakly to moderately lithified; gravelly sand; cut chips are 70% clasts of orange, red, green and brown quartzite, silvery schist, black and green diabase, orange chert, vein quartz, light gray felsic tuff, black basalt, gray and red limestone, trace epidote, 30% beige, light pink and yellow rhyolitic tuff, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: very weak	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.5 cm
1,630 - 1,640	496.8 - 499.9	Schist-rich conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are 70% clasts of orange, red, brown and green quartzite, black and green diabase, black basalt, silvery schist, gray limestone, orange chert, light gray and brown banded tuff, vein quartz, 30% beige to light pink rhyolitic tuff, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.8 cm
TERTIARY VOLCANICS- tuff (Tvs)				
1,640 - 1,650	499.9 - 502.9	Schist-rich conglomerate; weak red [2.5YR5/2]; weakly to moderately lithified; tuff and gravelly sand; cut chips are 65% beige to light pink rhyolitic tuff, 35% clasts of orange, red, brown and green quartzite, black and green diabase, black basalt, silvery schist, gray limestone, orange chert, light gray and brown banded tuff, vein quartz, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: very weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.1 cm
1,650 - 1,660	502.9 - 506.0	Schist-rich conglomerate; weak red [10R5/4]; well lithified; 98% pink and brown crystal-rich tuff with a light pink aphanitic groundmass and phenocrysts of quartz, feldspar and biotite, and 2% gravel of orange quartzite, orange chert, black basalt, white vein quartz, and trace epidote; reaction to acid: very weak	common iron oxide staining (hematite), trace calcite	subangular to subrounded chips up to 1.6 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
TERTIARY VOLCANICS- tuff (Tvs)				
1,660 - 1,670	506.0 - 509.0	Schist-rich conglomerate; weak red [2.5YR5/2]; well lithified; pink and brown crystal-rich rhyolitic tuff with light pinkish-brown aphanitic groundmass and phenocrysts of quartz, plagioclase and biotite, white pumice fragments, trace tiny lithics; reaction to acid: very weak	trace iron oxide staining, trace calcite	subangular to subrounded chips up to 2.0 cm
1,670 - 1,680	509.0 - 512.1	Schist-rich conglomerate; weak red [2.5YR5/2]; well lithified; pink and brown crystal-rich rhyolitic tuff with light pinkish-brown aphanitic groundmass and phenocrysts of quartz, plagioclase and biotite, white pumice fragments, trace tiny lithics or clasts of black basalt, orange chert, green and red quartzite; reaction to acid: very weak	trace iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.2 cm
GILA CONGLOMERATE- schist rich (QTg)				
1,680 - 1,690	512.1 - 515.1	Schist-rich conglomerate; reddish brown [5YR5/4], bluish gray [5PB5/1], and yellowish red [5YR5/8], and white; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, brown, red and green quartzite, black basalt, black and green diabase, silvery schist, orange chert, light pink rhyolitic tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.2 cm
1,690 - 1,700	515.1 - 518.2	Schist-rich conglomerate; reddish brown [5YR5/4], bluish gray [5PB5/1], and yellowish red [5YR5/8], and white; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, brown, red and green quartzite, black basalt, black and green diabase, silvery schist, orange chert, light pink rhyolitic tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: no to very weak	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.4 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- schist rich (QTg)				
1,700 - 1,710	518.2 - 521.2	Schist-rich conglomerate; reddish brown [5YR5/4], bluish gray [5PB5/1], and yellowish red [5YR5/8], and white; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, brown, red and green quartzite, black basalt, black and green diabase, silvery schist, orange chert, light pink rhyolitic tuff, trace orange limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: no to very weak	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 2.0 cm
1,710 - 1,720	521.2 - 524.3	Schist-rich conglomerate; reddish brown [5YR5/4], bluish gray [5PB5/1], and yellowish red [5YR5/8], and white; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, brown, red and green quartzite, black basalt, black and green diabase, silvery schist, orange chert, trace orange limestone, trace pink tuff, trace light gray and brown banded tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: no to very weak	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.4 cm
1,720 - 1,730	524.3 - 527.3	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, brown, red and green quartzite, black basalt, black and green diabase, silvery schist, orange chert, yellow vein quartz, trace orange limestone, trace pink tuff, trace light gray and brown banded tuff, trace rhyolitic tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 2.4 cm
1,730 - 1,740	527.3 - 530.4	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, brown, red and green quartzite, black basalt, black and green diabase, silvery schist, orange chert, yellow vein quartz, trace orange limestone, trace pink tuff, trace light gray and brown banded tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.5 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- schist rich (QTg)				
1,740 - 1,750	530.4 - 533.4	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, brown, red and green quartzite, black basalt, black and green diabase, silvery schist, orange chert, yellow vein quartz, white and orange limestone, trace pink tuff, trace light gray and brown banded tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.5 cm
1,750 - 1,760	533.4 - 536.4	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of orange, brown, red and green quartzite, black basalt, black and green diabase, silvery schist, orange chert, yellow vein quartz, trace pink tuff, trace light gray and brown banded tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 2.0 cm
1,760 - 1,770	536.4 - 539.5	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are 90% clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, white, brown and pink limestone, red chert, white and yellow vein quartz, pink tuff, trace epidote, and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.9 cm
1,770 - 1,780	539.5 - 542.5	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, white, brown and pink limestone, red chert, white and yellow vein quartz, pink tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.3 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- schist rich (QTg)				
1,780 - 1,790	542.5 - 545.6	Schist-rich conglomerate; light brown [7.5YR6/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, more pink rhyolitic tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.0 cm
1,790 - 1,800	545.6 - 548.6	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, pink rhyolitic tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 2% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.8 cm
1,800 - 1,810	548.6 - 551.7	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, pink rhyolitic tuff, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.0 cm
1,810 - 1,820	551.7 - 554.7	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, pink rhyolitic tuff, trace gray limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
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DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- schist rich (QTg)				
1,820 - 1,830	554.7 - 557.8	Schist-rich conglomerate; brown [7.5YR5/3], white [N8], and yellowish red [2.5YR5/8] and bluish gray [5PB5/1]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, pink rhyolitic tuff, trace gray limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: very weak	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.0 cm
1,830 - 1,840	557.8 - 560.8	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, pink rhyolitic tuff, trace gray limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.0 cm
1,840 - 1,850	560.8 - 563.9	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, pink rhyolitic tuff, trace gray limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 2.0 cm
1,850 - 1,860	563.9 - 566.9	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, pink rhyolitic tuff, trace gray limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 2.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- schist rich (QTg)				
1,860 - 1,870	566.9 - 570.0	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, pink rhyolitic tuff, trace gray limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 2.5 cm
1,870 - 1,880	570.0 - 573.0	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, pink rhyolitic tuff, trace gray limestone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 0.9 cm
1,880 - 1,890	573.0 - 576.1	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are 95% clasts of silvery schist, brown, green, orange and white quartzite, black, white and green diabase, black basalt, red chert, white and yellow vein quartz, pink rhyolitic tuff, trace gray limestone, trace epidote, and 5% matrix chips of brown silty sandstone; overall sample is 7% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.7 cm
1,890 - 1,900	576.1 - 579.1	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and red quartzite, black, white and green diabase, black basalt, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 2% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 2.1 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- schist rich (QTg)				
1,900 - 1,910	579.1 - 582.2	Schist-rich conglomerate; brown [7.5YR4/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and red quartzite, black, white and green diabase, black basalt, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.8 cm
1,910 - 1,920	582.2 - 585.2	Schist-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of silvery schist, brown, green, orange and red quartzite, black, white and green diabase, black basalt, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 2% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.1 cm
GILA CONGLOMERATE- diabase rich (QTg)				
1,920 - 1,930	585.2 - 588.3	Diabase-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of brown, green, orange and red quartzite, more black, white and green diabase, more black basalt, less silvery schist, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 2% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.1 cm
1,930 - 1,940	588.3 - 591.3	Diabase-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of brown, green, orange and red quartzite, black, white and green diabase, black basalt, silvery schist, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 2% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.1 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
1,940 - 1,950	591.3 - 594.4	Diabase-rich conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of brown, green, orange and red quartzite, black, white and green diabase, black basalt, silvery schist, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 2.0 cm
1,950 - 1,960	594.4 - 597.4	Diabase-rich conglomerate; brown [7.5YR5/4]; weakly to moderately lithified; gravelly sand; cut chips are clasts of brown, green, orange and red quartzite, black, white and green diabase, black basalt, silvery schist, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.0 cm
1,960 - 1,970	597.4 - 600.5	Diabase-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of brown, green, orange and red quartzite, black, white and green diabase, black basalt, silvery schist, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.0 cm
1,970 - 1,980	600.5 - 603.5	Diabase-rich conglomerate; brown [7.5YR5/2]; weakly to moderately lithified; gravelly sand; cut chips are clasts of brown, green, orange and red quartzite, black, white and green diabase, black basalt, silvery schist, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, yellow siliceous mudstone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 2% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 0.7 cm

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DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
1,980 - 1,990	603.5 - 606.6	Diabase-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of brown, green, orange and red quartzite, black, white and green diabase, black basalt, silvery schist, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace yellow siliceous mudstone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.0 cm
1,990 - 2,000	606.6 - 609.6	Diabase-rich conglomerate; brown [7.5YR5/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of brown, green, orange and red quartzite, more black, white and green diabase, less black basalt, silvery schist, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace yellow siliceous mudstone, trace epidote, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.3 cm
2,000 - 2,010	609.6 - 612.6	Diabase-rich conglomerate; brown [7.5YR5/3]; moderately lithified; gravelly sand; cut chips are clasts of brown, green, orange and red quartzite, black, white and green diabase, black basalt, silvery schist, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace yellow siliceous mudstone, trace epidote, and trace well-lithified matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.5 cm
2,010 - 2,020	612.6 - 615.7	Diabase-rich conglomerate; brown [7.5YR5/3]; moderately lithified; gravelly sand; cut chips are clasts of brown, green, orange and red quartzite, black, white and green diabase, black basalt, silvery schist, orange chert, gray and red limestone, pink tuff, white and yellow vein quartz, trace yellow siliceous mudstone, trace epidote, and trace well-lithified matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite), trace calcite	subangular to subrounded chips up to 1.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,020 - 2,030	615.7 - 618.7	Diabase-rich conglomerate; brown [7.5YR4/3]; weakly to moderately lithified; gravelly sand; cut chips are clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and trace matrix chips of easily broken brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
2,030 - 2,040	618.7 - 621.8	Diabase-rich conglomerate; brown [7.5YR4/3]; moderately lithified; gravelly sand; cut chips are 95% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 5% matrix chips of well-lithified brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.2 cm
2,040 - 2,050	621.8 - 624.8	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 80% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 20% matrix chips of well-lithified brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
2,050 - 2,060	624.8 - 627.9	Diabase-rich conglomerate; brown [7.5YR5/2]; moderately to well lithified; gravelly sand; cut chips are 95% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 5% matrix chips of well-lithified brown silty sandstone; overall sample is 7% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm

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Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,060 - 2,070	627.9 - 630.9	Diabase-rich conglomerate; brown [7.5YR4/3]; moderately to well lithified; gravelly sand; cut chips are 95% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 5% matrix chips of well-lithified brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm
2,070 - 2,080	630.9 - 634.0	Diabase-rich conglomerate; brown [7.5YR4/3]; moderately to well lithified; gravelly sand; cut chips are 95% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 5% matrix chips of well-lithified brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
2,080 - 2,090	634.0 - 637.0	Diabase-rich conglomerate; brown [7.5YR4/3]; moderately to well lithified; gravelly sand; cut chips are 90% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 10% matrix chips of well-lithified brown silty sandstone; overall sample is 12% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.2 cm
2,090 - 2,100	637.0 - 640.1	Diabase-rich conglomerate; brown [7.5YR5/3]; moderately to well lithified; gravelly sand; cut chips are 85% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 15% matrix chips of well-lithified brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: weak to moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,100 - 2,110	640.1 - 643.1	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; silty sandy gravel; cut chips are 70% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 30% matrix chips of well-lithified brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
2,110 - 2,120	643.1 - 646.2	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; gravelly sand; cut chips are 95% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 5% matrix chips of well-lithified brown silty sandstone; overall sample is 7% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,120 - 2,130	646.2 - 649.2	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; gravelly sand; cut chips are 95% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 5% matrix chips of well-lithified brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,130 - 2,140	649.2 - 652.3	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; gravelly sand; cut chips are 95% clasts of black, white and green diabase, black basalt, green, orange, brown and red quartzite, silvery schist, orange chert, gray and red limestone, white and yellow vein quartz, trace epidote, and 5% matrix chips of well-lithified brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: weak to moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,140 - 2,150	652.3 - 655.3	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 70% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red limestone, and 30% matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm
2,150 - 2,160	655.3 - 658.4	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 70% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 30% matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm
2,160 - 2,170	658.4 - 661.4	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 60% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 40% matrix chips of brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
2,170 - 2,180	661.4 - 664.5	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 50% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 50% matrix chips of brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
2,180 - 2,190	664.5 - 667.5	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 50% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 50% matrix chips of brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: very weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,190 - 2,200	667.5 - 670.6	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 65% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 35% matrix chips of brown silty sandstone; overall sample is 35% fines and matrix chips; reaction to acid: very weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
2,200 - 2,210	670.6 - 673.6	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; gravelly sand; cut chips are 85% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 15% matrix chips of brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: very weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm
2,210 - 2,220	673.6 - 676.7	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; silty sandy gravel; cut chips are 50% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 50% matrix chips of brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm
2,220 - 2,230	676.7 - 679.7	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; silty sandy gravel; cut chips are 60% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 40% matrix chips of brown silty sandstone; overall sample is 41% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,230 - 2,240	679.7 - 682.8	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; silty sandy gravel; cut chips are 70% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 30% matrix chips of brown silty sandstone; overall sample is 31% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,240 - 2,250	682.8 - 685.8	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; silty sandy gravel; cut chips are 70% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 30% matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
2,250 - 2,260	685.8 - 688.8	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; silty sandy gravel; cut chips are 50% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 50% matrix chips of brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
2,260 - 2,270	688.8 - 691.9	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; silty sandy gravel; cut chips are 50% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 50% matrix chips of brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: very weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,270 - 2,280	691.9 - 694.9	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; silty sandy gravel; cut chips are 70% clasts of black, white and green diabase, silvery schist, brown, red and green quartzite, orange chert, pink tuff, red and gray limestone, and 30% matrix chips of brown silty sandstone; overall sample is 31% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,280 - 2,290	694.9 - 698.0	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 65% clasts of silvery schist, green limestone with chlorite and epidote, orange, red and gray quartzite, gray and red limestone, orange chert, white vein quartz, and 35% matrix chips of brown silty sandstone; overall sample is 35% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,290 - 2,300	698.0 - 701.0	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 50% clasts of silvery schist, green limestone with chlorite and epidote, orange, red and gray quartzite, gray and red limestone, orange chert, white vein quartz, and 50% matrix chips of brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
2,300 - 2,310	701.0 - 704.1	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 70% clasts of silvery schist, green limestone with chlorite and epidote, orange, red and gray quartzite, gray and red limestone, orange chert, white vein quartz, and 30% matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.9 cm
2,310 - 2,320	704.1 - 707.1	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 60% clasts of silvery schist, orange, red and gray quartzite, gray and red limestone, orange chert, white vein quartz, trace green limestone, and 40% matrix chips of brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
2,320 - 2,330	707.1 - 710.2	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 60% clasts of silvery schist, orange, red and gray quartzite, gray and red limestone, orange chert, white vein quartz, trace green limestone, and 40% matrix chips of brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,330 - 2,340	710.2 - 713.2	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 70% clasts of silvery schist, orange, red and gray quartzite, gray and red limestone, orange chert, white vein quartz, trace green limestone, and 30% matrix chips of brown silty sandstone; overall sample is 30% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.4 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,340 - 2,350	713.2 - 716.3	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; gravelly sand; cut chips are 85% clasts of silvery schist, orange, red and gray quartzite, gray and red limestone, orange chert, white vein quartz, trace green limestone, and 15% matrix chips of brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	REVERSE CIRCULATION AIR ROTARY; subangular to subrounded chips up to 1.4 cm
2,350 - 2,360	716.3 - 719.3	Diabase-rich conglomerate; dark reddish gray [5YR4/2], very dark greenish gray [5G3/1], and light red [10R6/6], white [N8], and red [2.5YR4/6]; well lithified; silty sandy gravel; cut chips are 80% clasts of green and white diabase, silvery schist, orange, beige and red quartzite, gray limestone, green quartzite with epidote, trace light pink rhyolitic tuff, white vein quartz, and 20% matrix chips of brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.1 cm
2,360 - 2,370	719.3 - 722.4	Diabase-rich conglomerate; dark reddish gray [5YR4/2], very dark greenish gray [5G3/1], and light red [10R6/6], white [N8], and red [2.5YR4/6]; well lithified; silty sandy gravel; cut chips are 80% clasts of green and white diabase, silvery schist, orange, beige and red quartzite, gray limestone, green quartzite with epidote, trace light pink rhyolitic tuff, trace limestone with epidote, white vein quartz, and 20% matrix chips of brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
2,370 - 2,380	722.4 - 725.4	Diabase-rich conglomerate; dark reddish gray [5YR4/2], very dark greenish gray [5G3/1], and light red [10R6/6], white [N8], and red [2.5YR4/6]; well lithified; silty sandy gravel; cut chips are 50% clasts of green and white diabase, silvery schist, orange, beige and red quartzite, gray limestone, green quartzite with epidote, trace light pink rhyolitic tuff, trace limestone with epidote, white vein quartz, and 50% matrix chips of brown silty sandstone; overall sample is 50% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,380 - 2,390	725.4 - 728.5	Diabase-rich conglomerate; dark reddish gray [5YR4/2], very dark greenish gray [5G3/1], and light red [10R6/6], white [N8], and red [2.5YR4/6]; well lithified; silty sandy gravel; cut chips are 80% clasts of green and white diabase, silvery schist, orange, beige and red quartzite, gray limestone, green quartzite with epidote, light pink rhyolitic tuff, trace orange chert, white vein quartz, and 20% matrix chips of brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
2,390 - 2,400	728.5 - 731.5	Diabase-rich conglomerate; dark reddish gray [5YR4/2], very dark greenish gray [5G3/1], and light red [10R6/6], white [N8], and red [2.5YR4/6]; well lithified; silty sandy gravel; cut chips are 60% clasts of green and white diabase, silvery schist, orange, beige and red quartzite, gray limestone, green quartzite with epidote, trace light pink rhyolitic tuff, trace orange chert, white vein quartz, and 40% matrix chips of brown silty sandstone; overall sample is 40% fines and matrix chips; reaction to acid: weak to moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
2,400 - 2,410	731.5 - 734.6	Diabase-rich conglomerate; brown [7.5YR4/3]; well lithified; silty sandy gravel; cut chips are 60% clasts of green and white diabase, silvery schist, orange, beige and red quartzite, gray limestone, green quartzite with epidote, trace light pink rhyolitic tuff, trace orange chert, white vein quartz, and 40% matrix chips of brown silty sandstone; overall sample is 41% fines and matrix chips; reaction to acid: weak	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
2,410 - 2,420	734.6 - 737.6	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; silty sandy gravel; cut chips are 75% clasts of green and white diabase, silvery schist, orange, beige and red quartzite, gray limestone, green quartzite with epidote, trace light pink rhyolitic tuff, trace orange chert, trace green siliceous mudstone, white vein quartz, and 25% matrix chips of brown silty sandstone; overall sample is 26% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,420 - 2,430	737.6 - 740.7	Diabase-rich conglomerate; dark reddish gray [5YR4/2], very dark greenish gray [5G3/1], and light red [10R6/6], white [N8], and red [2.5YR4/6]; well lithified; silty sandy gravel; cut chips are 75% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 25% matrix chips of brown silty sandstone; overall sample is 25% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
2,430 - 2,440	740.7 - 743.7	Diabase-rich conglomerate; dark reddish gray [5YR4/2], very dark greenish gray [5G3/1], and light red [10R6/6], white [N8], and red [2.5YR4/6]; well lithified; gravelly sand; cut chips are 85% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 15% matrix chips of brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm
2,440 - 2,450	743.7 - 746.8	Diabase-rich conglomerate; brown [7.5YR5/4]; well lithified; gravelly sand; cut chips are 85% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 15% matrix chips of brown silty sandstone; overall sample is 19% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.9 cm
2,450 - 2,460	746.8 - 749.8	Diabase-rich conglomerate; brown [7.5YR5/4]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 10% matrix chips of brown silty sandstone; overall sample is 12% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,460 - 2,470	749.8 - 752.9	Diabase-rich conglomerate; dark reddish gray [5YR4/2], very dark greenish gray [5G3/1], and light red [10R6/6], white [N8], and red [2.5YR4/6]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,470 - 2,480	752.9 - 755.9	Diabase-rich conglomerate; dark reddish gray [5YR4/2], very dark greenish gray [5G3/1], and light red [10R6/6], white [N8], and red [2.5YR4/6]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: weak	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,480 - 2,490	755.9 - 759.0	Diabase-rich conglomerate; brown [7.5YR5/4]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
2,490 - 2,500	759.0 - 762.0	Diabase-rich conglomerate; brown [7.5YR5/4]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,500 - 2,510	762.0 - 765.0	Diabase-rich conglomerate; brown [7.5YR5/4]; well lithified; silty sandy gravel; cut chips are 80% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 20% matrix chips of brown silty sandstone; overall sample is 24% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.4 cm
2,510 - 2,520	765.0 - 768.1	Diabase-rich conglomerate; brown [7.5YR5/4]; well lithified; gravelly sand; cut chips are 85% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 15% matrix chips of brown silty sandstone; overall sample is 17% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
2,520 - 2,530	768.1 - 771.1	Diabase-rich conglomerate; brown [7.5YR5/4]; well lithified; silty sandy gravel; cut chips are 65% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 35% matrix chips of brown silty sandstone; overall sample is 36% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
2,530 - 2,540	771.1 - 774.2	Diabase-rich conglomerate; brown [7.5YR5/4]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 5% matrix chips of brown silty sandstone; overall sample is 7% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
2,540 - 2,550	774.2 - 777.2	Diabase-rich conglomerate; brown [7.5YR5/4]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, orange, red and green quartzite, silvery schist, orange chert, white vein quartz, gray and pink limestone, trace epidote, and 5% matrix chips of brown silty sandstone; overall sample is 7% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
2,550 - 2,560	777.2 - 780.3	Diabase-rich conglomerate; NO SAMPLE	common iron oxide staining (hematite and limonite)	

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,560 - 2,570	780.3 - 783.3	Diabase-rich conglomerate; brown [7.5YR5/4]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, orange, red and green quartzite, pink and gray limestone, white vein quartz, and 5% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
2,570 - 2,580	783.3 - 786.4	Diabase-rich conglomerate; light brown [7.5YR6/4]; well lithified; gravelly sand; cut chips are clasts of green diabase, orange, red and green quartzite, pink and gray limestone, white and yellow vein quartz, light pink tuff, and trace matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.5 cm
2,580 - 2,590	786.4 - 789.4	Diabase-rich conglomerate; light brown [7.5YR6/4]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, orange, red and green quartzite, pink and gray limestone, white and yellow vein quartz, light pink tuff, orange chert, and 5% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.5 cm
2,590 - 2,600	789.4 - 792.5	Diabase-rich conglomerate; light brown [7.5YR6/4]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, orange, red and green quartzite, pink and gray limestone, white and yellow vein quartz, light pink tuff, orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,600 - 2,610	792.5 - 795.5	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, orange, red, green and white quartzite, pink, gray and brown limestone, white and yellow vein quartz, light pink tuff, orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,610 - 2,620	795.5 - 798.6	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, orange, red, green and white quartzite, pink, gray and brown limestone, white and yellow vein quartz, light pink tuff, orange chert, and 5% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
2,620 - 2,630	798.6 - 801.6	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, orange, red, green and white quartzite, pink, gray and brown limestone, white and yellow vein quartz, light pink tuff, orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite), trace calcite on fracture surface	subangular to subrounded chips up to 1.0 cm
2,630 - 2,640	801.6 - 804.7	Diabase-rich conglomerate; brown [7.5YR5/3]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, orange, red, green and white quartzite, pink, gray and brown limestone, white and yellow vein quartz, light pink tuff, orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 14% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
2,640 - 2,650	804.7 - 807.7	Diabase-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; sandy gravel; cut chips are 90% clasts of more pink, gray and brown limestone, green diabase, orange, red, green and white quartzite, white and yellow vein quartz, light pink tuff, orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.8 cm; mostly larger chips

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- diabase rich (QTg)				
2,650 - 2,660	807.7 - 810.8	Diabase-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; silty sandy gravel; cut chips are 75% clasts of pink, gray and brown limestone, green diabase, orange, red, green and white quartzite, white and yellow vein quartz, light pink tuff, orange chert, and 25% matrix chips of brown silty sandstone; overall sample is 25% fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.8 cm; mostly larger chips
2,660 - 2,670	810.8 - 813.8	Diabase-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 85% clasts of pink, gray and brown limestone, green diabase, orange, red, green and white quartzite, white and yellow vein quartz, light pink tuff, orange chert, trace light gray tuff, and 15% matrix chips of brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: moderate to strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
2,670 - 2,680	813.8 - 816.9	Diabase-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; silty sandy gravel; cut chips are 80% clasts of pink, gray and brown limestone, green diabase, orange, red, green and white quartzite, white and yellow vein quartz, light pink tuff, orange chert, trace light gray tuff, and 20% matrix chips of brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: moderate to strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.1 cm
GILA CONGLOMERATE- limestone and diabase rich (QTg)				
2,680 - 2,690	816.9 - 819.9	Pink dolomitic limestone and diabase-rich conglomerate; pink (neon pink) and dark greenish gray [10GY4/1]; well lithified; gravelly sand; cut chips are clasts of 80% neon pink dolomitic limestone, 10% green diabase, 10% gray dolomite, orange and white quartzite, vein quartz, gray limestone, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: strong	abundant iron oxide staining (hematite and limonite), vein calcite	subangular to subrounded chips up to 1.4 cm

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Resolution Copper Mining
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DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- limestone rich (QTg)				
2,690 - 2,700	819.9 - 823.0	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, gray and brown limestone, neon pink dolomitic limestone, orange, brown, red and white quartzite, vein quartz, orange chert, and 5% matrix chips of brown silty sandstone; reaction to acid: strong		subangular to subrounded chips up to 0.6 cm
2,700 - 2,710	823.0 - 826.0	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, brown, pink and gray limestone, green, brown, orange and white quartzite, vein quartz, light pink tuff, orange chert, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
2,710 - 2,720	826.0 - 829.1	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, brown, pink and gray limestone, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange chert, trace oolitic limestone, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.7 cm
2,720 - 2,730	829.1 - 832.1	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, brown, pink and gray limestone, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- limestone rich (QTg)				
2,730 - 2,740	832.1 - 835.2	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, brown, pink and gray limestone, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.6 cm
2,740 - 2,750	835.2 - 838.2	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, brown, pink and gray limestone, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.6 cm
2,750 - 2,760	838.2 - 841.2	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, brown, pink and gray limestone, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: moderate	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm
2,760 - 2,770	841.2 - 844.3	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, brown, pink and gray limestone, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- limestone rich (QTg)				
2,770 - 2,780	844.3 - 847.3	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are clasts of green diabase, brown, pink and gray limestone, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: moderate	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.5 cm
2,780 - 2,790	847.3 - 850.4	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 90% clasts of green diabase, brown, pink and gray limestone, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
2,790 - 2,800	850.4 - 853.4	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 95% clasts of green diabase, brown, pink and gray limestone, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.5 cm
2,800 - 2,810	853.4 - 856.5	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; silty sandy gravel; cut chips are 80% clasts of brown, pink and gray limestone, less green diabase, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 20% matrix chips of brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- limestone rich (QTg)				
2,810 - 2,820	856.5 - 859.5	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 85% clasts of brown, pink and gray limestone, green diabase, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 15% matrix chips of brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.1 cm
2,820 - 2,830	859.5 - 862.6	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 90% clasts of brown, pink, gray and yellow limestone, green diabase, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
2,830 - 2,840	862.6 - 865.6	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1], white [N8], and weak red [2.5YR5/2]; well lithified; gravelly sand; cut chips are 90% clasts of brown, pink, gray and yellow limestone, green diabase, green, brown, orange, white and yellow quartzite, vein quartz, light pink tuff, orange and gray chert, trace oolitic limestone, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 2.0 cm
2,840 - 2,850	865.6 - 868.7	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R5/4], and dark greenish gray [10GY4/1] and yellowish brown [10YR5/4]; well lithified; gravelly sand; cut chips are 95% gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- limestone rich (QTg)				
2,850 - 2,860	868.7 - 871.7	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R5/4], and dark greenish gray [10GY4/1] and yellowish brown [10YR5/4]; well lithified; gravelly sand; cut chips are gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, and trace matrix chips of brown silty sandstone; overall sample is trace fines and matrix chips; reaction to acid: strong	some iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,860 - 2,870	871.7 - 874.8	Limestone-rich conglomerate; brown [7.5YR6/3]; well lithified; gravelly sand; cut chips are gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, and trace matrix chips of brown silty sandstone; overall sample is 2% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
2,870 - 2,880	874.8 - 877.8	Limestone-rich conglomerate; brown [7.5YR6/3], weak red [10R5/4], and dark greenish gray [10GY4/1] and yellowish brown [10YR5/4]; well lithified; gravelly sand; cut chips are 95% gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, vein quartz, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
2,880 - 2,890	877.8 - 880.9	Limestone-rich conglomerate; brown [7.5YR6/3], weak red [10R5/4], and dark greenish gray [10GY4/1] and yellowish brown [10YR5/4]; well lithified; gravelly sand; cut chips are 95% gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, vein quartz, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- limestone rich (QTg)				
2,890 - 2,900	880.9 - 883.9	Limestone-rich conglomerate; brown [7.5YR6/3], weak red [10R5/4], and dark greenish gray [10GY4/1] and yellowish brown [10YR5/4]; well lithified; gravelly sand; cut chips are 95% gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, vein quartz, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: very strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
2,900 - 2,910	883.9 - 887.0	Limestone-rich conglomerate; brown [7.5YR6/3]; well lithified; gravelly sand; cut chips are 90% gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, vein quartz, and 10% matrix chips of brown silty sandstone; overall sample is 10% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
2,910 - 2,920	887.0 - 890.0	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R5/4], and dark greenish gray [10GY4/1] and yellowish brown [10YR5/4]; well lithified; gravelly sand; cut chips are 95% gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, vein quartz, and 5% matrix chips of brown silty sandstone; overall sample is 5% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm
2,920 - 2,930	890.0 - 893.1	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R5/4], and dark greenish gray [10GY4/1] and yellowish brown [10YR5/4]; well lithified; gravelly sand; cut chips are 85% gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, vein quartz, and 15% matrix chips of brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.3 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- limestone rich (QTg)				
2,930 - 2,940	893.1 - 896.1	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R5/4], and dark greenish gray [10GY4/1] and yellowish brown [10YR5/4]; well lithified; gravelly sand; cut chips are 85% gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, vein quartz, and 15% matrix chips of brown silty sandstone; overall sample is 15% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.9 cm
2,940 - 2,950	896.1 - 899.2	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R5/4], and dark greenish gray [10GY4/1] and yellowish brown [10YR5/4]; well lithified; silty sandy gravel; cut chips are 80% gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, vein quartz, and 20% matrix chips of brown silty sandstone; overall sample is 20% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.0 cm
2,950 - 2,960	899.2 - 902.2	Limestone-rich conglomerate; brown [7.5YR6/3]; well lithified; gravelly sand; cut chips are 90% gray, brown and pink limestone, red, brown, white and yellow quartzite, green diabase, gray tuff, orange chert, vein quartz, and 10% matrix chips of brown silty sandstone; overall sample is 12% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 1.2 cm
2,960 - 2,970	902.2 - 905.3	Limestone-rich conglomerate; NO SAMPLE		
2,970 - 2,980	905.3 - 908.3	Limestone-rich conglomerate; NO SAMPLE		
2,980 - 2,990	908.3 - 911.4	Limestone-rich conglomerate; brown [7.5YR6/3]; well lithified; gravelly sand; cut chips are 85% clasts of gray, pink and red limestone, orange, white, brown and red quartzite, green diabase, dark gray shale, and 15% matrix chips of brown silty sandstone; overall sample is 17% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.8 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- limestone rich (QTg)				
2,990 - 3,000	911.4 - 914.4	Limestone-rich conglomerate; brown [7.5YR6/3]; well lithified; gravelly sand; cut chips are 85% clasts of gray, pink and red limestone, orange, white, brown and red quartzite, green diabase, dark gray shale, and 15% matrix chips of brown silty sandstone; overall sample is 17% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.5 cm
3,000 - 3,010	914.4 - 917.4	Limestone-rich conglomerate; brown [7.5YR6/3]; well lithified; gravelly sand; cut chips are 85% clasts of gray, pink and red limestone, orange, white, brown and red quartzite, green diabase, dark gray shale, trace light pink tuff, and 15% matrix chips of brown silty sandstone; overall sample is 17% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
3,010 - 3,018	917.4 - 919.9	Limestone-rich conglomerate; brown [7.5YR6/3]; well lithified; gravelly sand; cut chips are 90% clasts of gray, pink and red limestone, orange, white, brown and red quartzite, green diabase, dark gray shale, light pink tuff, and 10% matrix chips of brown silty sandstone; overall sample is 12% fines and matrix chips; reaction to acid: strong	common iron oxide staining (hematite and limonite)	subangular to subrounded chips up to 0.7 cm
3,020 - 3,030	920.5 - 923.5	Limestone-rich conglomerate; brown [7.5YR5/3], weak red [10R4/4], and greenish gray [5GY5/1]; well lithified; sandy silty gravelly sand; cut chips are 70% clasts of gray, tan and pink limestone, green diabase, gray, brown, red and white quartzite, vein quartz, orange chert, light pink and gray tuff, and 30% matrix chips of brown silty mudstone; reaction to acid: strong	trace iron oxide staining (hematite) on clasts	subangular to subrounded chips up to 1.1 cm
3,030 - 3,040	923.5 - 926.6	Limestone-rich conglomerate; brown [7.5YR5/3] and weak red [10R4/4]; well lithified; sandy silty gravelly sand; cut chips are 70% clasts of gray, tan, light purple and pink limestone, green diabase, gray, brown, red and white quartzite, vein quartz, orange chert, light pink and gray tuff, and 30% matrix chips of brown silty mudstone; reaction to acid: strong	trace iron oxide staining (hematite) on clasts	subangular to subrounded chips up to 0.9 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- limestone rich (QTg)				
3,040 - 3,050	926.6 - 929.6	Limestone-rich conglomerate; brown [7.5YR5/3] and weak red [10R4/4]; well lithified; sandy silty gravelly sand; cut chips are 60% clasts of black siltstone, gray, tan, light purple and pink limestone, green diabase, gray, brown, red and white quartzite, greenish-brown mudstone, vein quartz, orange chert, light pink and gray tuff, and 40% matrix chips of brown silty mudstone; reaction to acid: strong	trace iron oxide staining (hematite) on clasts	subangular to subrounded chips up to 2.0 cm
3,050 - 3,060	929.6 - 932.7	Limestone-rich conglomerate; brown [7.5YR5/3] and weak red [10R4/4]; well lithified; sandy silty gravelly sand; cut chips are 80% clasts of black siltstone, gray, tan, light purple and pink limestone, green diabase, gray, brown, red and white quartzite, greenish-brown mudstone, vein quartz, orange chert, light pink and gray tuff, and 20% matrix chips of brown silty mudstone; reaction to acid: strong	trace iron oxide staining (hematite) on clasts	subangular to subrounded chips up to 1.9 cm
3,060 - 3,070	932.7 - 935.7	Limestone-rich conglomerate; brown [7.5YR5/3] and weak red [10R4/4]; well lithified; sandy silty gravelly sand; cut chips are 80% clasts of black siltstone, gray, tan, light purple and pink limestone, green diabase, gray, brown, red and white quartzite, greenish-brown mudstone, vein quartz, orange chert, light pink and gray tuff, and 20% matrix chips of brown silty mudstone; reaction to acid: strong	trace iron oxide staining (hematite) on clasts	subangular to subrounded chips up to 1.4 cm
3,070 - 3,080	935.7 - 938.8	Limestone-rich conglomerate; brown [7.5YR5/3] and weak red [10R4/4]; well lithified; sandy silty gravelly sand; cut chips are 80% clasts of black siltstone, gray, tan, light purple and pink limestone, green diabase, mostly orange, gray, brown, red and white quartzite, greenish-brown mudstone, vein quartz, orange chert, light pink and gray tuff, and 20% matrix chips of brown silty mudstone; reaction to acid: strong	trace iron oxide staining (hematite) on clasts	subangular to subrounded chips up to 1.6 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
GILA CONGLOMERATE- limestone rich (QTg)				
3,080 - 3,090	938.8 - 941.8	Limestone-rich conglomerate; brown [7.5YR5/3] and weak red [10R4/4]; well lithified; sandy silty gravelly sand; cut chips are 80% clasts of black siltstone, gray, tan, light purple and pink limestone, green diabase, mostly orange, gray, brown, red and white quartzite, greenish-brown mudstone, vein quartz, orange chert, light pink and gray tuff, and 20% matrix chips of brown silty mudstone; reaction to acid: strong	trace iron oxide staining (hematite) on clasts	subangular to subrounded chips up to 1.2 cm
3,090 - 3,100	941.8 - 944.9	Limestone-rich conglomerate; brown [7.5YR5/3] and weak red [10R4/4]; well lithified; sandy silty gravelly sand; cut chips are 80% clasts of black siltstone, gray, tan, light purple and pink limestone, green diabase, mostly orange, gray, brown, red and white quartzite, greenish-brown mudstone, vein quartz, orange chert, light pink and gray tuff, and 20% matrix chips of brown silty mudstone, red-brown and tan clay/gouge; reaction to acid: strong	trace iron oxide staining (hematite) on clasts and in clay	subangular to subrounded chips up to 1.7 cm
APACHE LEAP TUFF - White Unit (Talw)				
3,100 - 3,110	944.9 - 947.9	White Unit; brown [7.5YR5/3], reddish brown [2.5YR5/4], and greenish gray [5GY5/1]; well lithified; 80% porphyritic tuff with 60% aphanitic white groundmass and 40% phenocrysts of plagioclase, quartz, and biotite; 20% clasts of black siltstone, gray, tan, light purple and pink limestone, green diabase, mostly orange, gray, brown, red and white quartzite, greenish-brown mudstone, vein quartz, orange chert, light pink and gray tuff, and matrix chips of brown silty mudstone; reaction to acid: no to strong	trace iron oxide staining (hematite) on clasts	subangular to subrounded chips up to 1.6 cm
3,110 - 3,120	947.9 - 951.0	White Unit; reddish brown [2.5YR5/4] and greenish gray [5GY5/1]; well lithified; 60% porphyritic tuff with 60% aphanitic white groundmass and 40% phenocrysts of plagioclase, quartz, and biotite; 30% greenish-gray mudstone; 10% clasts of black siltstone, gray, tan, light purple and pink limestone, green diabase, mostly orange, gray, brown, red and white quartzite, greenish-brown mudstone, vein quartz, orange chert, light pink and gray tuff, and matrix chips of brown silty mudstone; reaction to acid: no to weak		subrounded chips up to 0.8 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - White Unit (Talw)				
3,120 - 3,130	951.0 - 954.0	White Unit; reddish brown [2.5YR5/4] and greenish gray [5GY5/1]; well lithified; 95% porphyritic tuff with 60% aphanitic white groundmass, 40% phenocrysts: plagioclase, quartz, and biotite; 5% clasts of black siltstone, gray, tan, light purple and pink limestone, green diabase, mostly orange, gray, brown, red and white quartzite, greenish-brown mudstone, vein quartz, orange chert, light pink and gray tuff, and matrix chips of brown silty mudstone; reaction to acid: no		subrounded chips up to 0.8 cm
3,130 - 3,140	954.0 - 957.1	White Unit; reddish brown [2.5YR5/4] and greenish gray [5GY5/1]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 40% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 5% euhedral bronzy to black biotite, trace amphibole, trace pumice, trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite)	subrounded chips up to 1.9 cm
3,140 - 3,150	957.1 - 960.1	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 40% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 5% euhedral bronzy to black biotite, trace amphibole, trace pumice, trace dark brown silty clay balls, trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite)	subrounded chips up to 2.3 cm
3,150 - 3,160	960.1 - 963.2	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 40% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 5% euhedral bronzy to black biotite, trace amphibole, trace pumice, trace dark brown silty clay balls, very trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite)	subrounded chips up to 1.1 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - White Unit (Talw)				
3,160 - 3,170	963.2 - 966.2	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 40% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 5% euhedral bronzy to black biotite, trace amphibole, very trace pumice; reaction to acid: no	very trace iron oxide staining (hematite and limonite)	subangular chips up to 2.0 cm
3,170 - 3,180	966.2 - 969.3	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 40% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 5% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite)	subangular chips up to 2.2 cm
3,180 - 3,190	969.3 - 972.3	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 37% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 8% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite)	subangular chips up to 2.0 cm
3,190 - 3,200	972.3 - 975.4	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 37% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 8% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite)	subangular chips up to 1.8 cm
3,200 - 3,210	975.4 - 978.4	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 37% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 8% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite), very trace milky quartz vein	subangular chips up to 2.4 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - White Unit (Talw)				
3,210 - 3,220	978.4 - 981.5	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 40% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 5% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite)	subangular chips up to 1.6 cm
3,220 - 3,230	981.5 - 984.5	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 40% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 5% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite), very trace slickensides	subangular chips up to 2.0 cm
3,230 - 3,240	984.5 - 987.6	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 40% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 5% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite), very trace calcite vein, minor slickensides	subangular chips up to 1.7 cm
3,240 - 3,250	987.6 - 990.6	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of reddish-brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and more limonite), very trace slickensides	subangular chips up to 1.2 cm
3,250 - 3,260	990.6 - 993.6	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of reddish-brown siltstone, dark gray siltstone; reaction to acid: no	very trace iron oxide staining (hematite and more limonite)	subangular chips up to 2.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - White Unit (Talw)				
3,260 - 3,270	993.6 - 996.7	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of reddish-brown siltstone, dark gray siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace slickensides	subangular chips up to 1.7 cm
3,270 - 3,280	996.7 - 999.7	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of dark gray siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace slickensides, very trace calcite vein	subangular chips up to 1.9 cm
3,280 - 3,290	999.7 - 1,002.8	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of red to dark brown siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace magnetite	subangular chips up to 1.7 cm
3,290 - 3,300	1,002.8 - 1,005.8	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of red to dark brown siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace magnetite	subangular chips up to 2.3 cm
3,300 - 3,310	1,005.8 - 1,008.9	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of red to dark brown siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace magnetite	subangular chips up to 2.3 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - White Unit (Talw)				
3,310 - 3,320	1,008.9 - 1,011.9	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of red to dark brown siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace magnetite	subangular chips up to 1.6 cm
3,320 - 3,330	1,011.9 - 1,015.0	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of red to dark brown siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace magnetite	subangular chips up to 2.1 cm
3,330 - 3,340	1,015.0 - 1,018.0	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of red to dark brown siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace magnetite	subangular chips up to 1.4 cm
3,340 - 3,350	1,018.0 - 1,021.1	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 38% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 7% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of red to dark brown siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace magnetite	subangular chips up to 1.5 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - White Unit (Talw)				
3,350 - 3,360	1,021.1 - 1,024.1	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 38% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 7% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of red to dark brown siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace magnetite	subangular chips up to 1.8 cm
3,360 - 3,370	1,024.1 - 1,027.2	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 38% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 7% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of red to dark brown siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace magnetite	subangular chips up to 1.9 cm
3,370 - 3,380	1,027.2 - 1,030.2	White Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 1-2 mm sized phenocrysts of 38% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 7% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of red to dark brown siltstone; reaction to acid: no	trace iron oxide staining (limonite), very trace slickensides	subangular chips up to 1.7 cm
3,380 - 3,390	1,030.2 - 1,033.3	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% white to light pink aphanitic groundmass and 50% up to 1-2 mm sized phenocrysts of 38% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 7% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	trace milky quartz vein, very trace slickensides	subangular chips up to 2.4 cm
3,390 - 3,400	1,033.3 - 1,036.3	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% white to light pink aphanitic groundmass and 50% up to 1-2 mm sized phenocrysts of 38% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 7% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite), very trace slickensides	subangular chips up to 2.1 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - White Unit (Talw)				
3,400 - 3,410	1,036.3 - 1,039.4	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% white to light pink aphanitic groundmass and 50% up to 2-4 mm sized phenocrysts of 38% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 7% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite)	subangular chips up to 1.9 cm
3,410 - 3,420	1,039.4 - 1,042.4	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% white to light pink aphanitic groundmass and 50% up to 2-4 mm sized phenocrysts of 38% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 7% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite), very trace magnetite	subangular chips up to 1.9 cm
3,420 - 3,430	1,042.4 - 1,045.5	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% white to light pink aphanitic groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace slickensides, very trace magnetite	subangular chips up to 2.1 cm
3,430 - 3,440	1,045.5 - 1,048.5	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% white to light pink aphanitic groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	trace slickensides, very trace magnetite	subangular chips up to 1.8 cm
3,440 - 3,450	1,048.5 - 1,051.6	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% white to light pink aphanitic groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 2.3 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - White Unit (Talw)				
3,450 - 3,460	1,051.6 - 1,054.6	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 1.7 cm
3,460 - 3,470	1,054.6 - 1,057.7	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace magnetite, very trace slickensides	subangular chips up to 1.4 cm
3,470 - 3,480	1,057.7 - 1,060.7	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% white to light pink aphanitic groundmass and 40% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace magnetite, very trace slickensides, very trace calcite vein	subangular chips up to 1.6 cm
3,480 - 3,488	1,060.7 - 1,063.1	White Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink aphanitic groundmass and 40% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace magnetite, very trace milky quartz vein	subangular chips up to 1.8 cm
3,488 - 3,500	1,063.1 - 1,066.8	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole (clumped together), very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 1.8 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,500 - 3,510	1,066.8 - 1,069.8	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, trace lithic fragments of brown siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 2.3 cm
3,510 - 3,520	1,069.8 - 1,072.9	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, 1% lithic fragments of brownish-gray siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 1.9 cm
3,520 - 3,530	1,072.9 - 1,075.9	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace brown chert, 1% lithic fragments of brownish-gray siltstone; reaction to acid: no		subangular chips up to 1.8 cm
3,530 - 3,540	1,075.9 - 1,079.0	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of brownish-gray siltstone; reaction to acid: no	trace iron oxide staining (limonite), trace calcite vein, very trace slickensides	subangular chips up to 2.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,540 - 3,550	1,079.0 - 1,082.0	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole; reaction to acid: no		subangular chips up to 1.7 cm
3,550 - 3,560	1,082.0 - 1,085.1	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of dark brown siltstone; reaction to acid: no	trace milky vein quartz	subangular chips up to 1.4 cm
3,560 - 3,570	1,085.1 - 1,088.1	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of dark brown siltstone; reaction to acid: no	trace milky vein quartz, very trace slickensides	subangular chips up to 1.8 cm
3,570 - 3,580	1,088.1 - 1,091.2	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of dark brown siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 2.0 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,580 - 3,590	1,091.2 - 1,094.2	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of dark brown siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 1.7 cm
3,590 - 3,600	1,094.2 - 1,097.3	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of dark brown siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 1.6 cm
3,600 - 3,610	1,097.3 - 1,100.3	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of brown siltstone; reaction to acid: no	minor milky quartz vein, very trace iron oxide staining (limonite), very trace magnetite	subangular chips up to 1.5 cm
3,610 - 3,620	1,100.3 - 1,103.4	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of brown siltstone; reaction to acid: no	very trace milky quartz vein, very trace magnetite	subangular chips up to 1.5 cm
3,620 - 3,630	1,103.4 - 1,106.4	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of brown siltstone; reaction to acid: no	very trace milky quartz vein	subangular chips up to 1.6 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,630 - 3,640	1,106.4 - 1,109.5	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of brown siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 1.7 cm
3,640 - 3,650	1,109.5 - 1,112.5	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of brown siltstone; reaction to acid: no	trace magnetite	subangular chips up to 1.7 cm
3,650 - 3,660	1,112.5 - 1,115.6	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of brown siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 2.0 cm
3,660 - 3,670	1,115.6 - 1,118.6	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, trace amphibole; reaction to acid: no	very trace magnetite	subangular chips up to 1.5 cm
3,670 - 3,680	1,118.6 - 1,121.7	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, trace amphibole; reaction to acid: no	very trace magnetite	subangular chips up to 1.6 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,680 - 3,690	1,121.7 - 1,124.7	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace lithic fragments of dark grayish-brown siltstone; reaction to acid: no	very trace magnetite	subangular chips up to 1.6 cm
3,690 - 3,700	1,124.7 - 1,127.8	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole; reaction to acid: no		subangular chips up to 1.7 cm
3,700 - 3,710	1,127.8 - 1,130.8	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace lithic fragments of dark grayish-brown siltstone; reaction to acid: no		subangular chips up to 1.5 cm
3,710 - 3,720	1,130.8 - 1,133.9	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace lithic fragments of dark grayish-brown siltstone; reaction to acid: no		subangular chips up to 1.6 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,720 - 3,730	1,133.9 - 1,136.9	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, trace amphibole, very trace lithic fragments of dark grayish-brown siltstone, black mudstone; reaction to acid: no		subangular chips up to 1.7 cm
3,730 - 3,740	1,136.9 - 1,140.0	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of dark grayish-brown siltstone; reaction to acid: no		subangular chips up to 1.9 cm
3,740 - 3,750	1,140.0 - 1,143.0	Gray Unit; reddish brown [2.5YR4/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 42% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of dark grayish-brown siltstone, trace gray tuff; reaction to acid: no		subangular chips up to 1.8 cm
3,750 - 3,760	1,143.0 - 1,146.0	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 40% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of dark gray siltstone; reaction to acid: no		subangular chips up to 1.6 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,760 - 3,770	1,146.0 - 1,149.1	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 50% pink to pinkish-gray aphanitic to microcrystalline groundmass and 50% up to 2-4 mm sized phenocrysts of 40% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, 1% amphibole, trace lithic fragments of dark gray siltstone; reaction to acid: no		subangular chips up to 1.5 cm
3,770 - 3,780	1,149.1 - 1,152.1	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of dark gray siltstone; reaction to acid: no		subangular chips up to 1.5 cm
3,780 - 3,790	1,152.1 - 1,155.2	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole, trace lithic fragments of dark gray siltstone; reaction to acid: no		subangular chips up to 1.9 cm
3,790 - 3,800	1,155.2 - 1,158.2	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole, very trace lithic fragments of dark gray siltstone; reaction to acid: no		subangular chips up to 1.6 cm
3,800 - 3,810	1,158.2 - 1,161.3	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.7 cm

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,810 - 3,820	1,161.3 - 1,164.3	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.6 cm
3,820 - 3,830	1,164.3 - 1,167.4	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 43% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 2% euhedral bronzy to black biotite, trace amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.7 cm
3,830 - 3,840	1,167.4 - 1,170.4	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.9 cm
3,840 - 3,850	1,170.4 - 1,173.5	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.4 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,850 - 3,860	1,173.5 - 1,176.5	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.6 cm
3,860 - 3,870	1,176.5 - 1,179.6	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no		subangular chips up to 1.6 cm
3,870 - 3,880	1,179.6 - 1,182.6	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 41% clear to smoky quartz, 55% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no		subangular chips up to 1.8 cm
3,880 - 3,890	1,182.6 - 1,185.7	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 61% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.9 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,890 - 3,900	1,185.7 - 1,188.7	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 61% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite), trace calcite vein	subangular chips up to 2.0 cm
3,900 - 3,910	1,188.7 - 1,191.8	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 61% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite), trace calcite vein	subangular chips up to 1.9 cm
3,910 - 3,920	1,191.8 - 1,194.8	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 61% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite), trace calcite vein	subangular chips up to 1.4 cm
3,920 - 3,930	1,194.8 - 1,197.9	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 61% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite), minor calcite vein	subangular chips up to 1.6 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Gray Unit (Talg)				
3,930 - 3,940	1,197.9 - 1,200.9	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 61% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.4 cm
3,940 - 3,950	1,200.9 - 1,204.0	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 61% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.4 cm
APACHE LEAP TUFF - Brown Unit (Talb)				
3,950 - 3,960	1,204.0 - 1,207.0	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 61% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.9 cm
3,960 - 3,970	1,207.0 - 1,210.1	Gray Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% pink to pinkish-gray aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 61% anhedral, pink to milky white feldspar, 3% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 1.4 cm

LITHOLOGIC DESCRIPTION OF DRILL CUTTINGS FROM HYDROGEOLOGIC TEST WELL DHRES-05
Resolution Copper Mining
Pinal County, Arizona

DEPTH INTERVAL (feet)	DEPTH INTERVAL (meters)	GENERAL DESCRIPTION	SECONDARY FEATURES	COMMENTS
APACHE LEAP TUFF - Brown Unit (Talb)				
3,970 - 3,980	1,210.1 - 1,213.1	Brown Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% reddish-brown aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 60% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite)	subangular chips up to 0.7 cm
3,980 - 3,990	1,213.1 - 1,216.2	Brown Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% reddish-brown aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 60% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, 1% amphibole, very trace lithic fragments of grayish-brown siltstone, red silty sandstone; reaction to acid: no	very trace iron oxide staining (hematite and limonite)	subangular chips up to 0.9 cm
3,990 - 4,000	1,216.2 - 1,219.2	Brown Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% reddish-brown aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 60% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, 1% amphibole; reaction to acid: no	very trace iron oxide staining (hematite and limonite)	subangular chips up to 1.7 cm
4,000 - 4,010	1,219.2 - 1,222.2	Brown Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% reddish-brown aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 60% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, 1% amphibole; reaction to acid: no	very trace iron oxide staining (hematite and limonite)	subangular chips up to 1.2 cm
4,010 - 4,018	1,222.2 - 1,224.7	Brown Unit; reddish brown [2.5YR5/4]; well lithified; porphyritic tuff with 60% reddish-brown aphanitic to microcrystalline groundmass and 40% up to 2-4 mm sized phenocrysts of 35% clear to smoky quartz, 60% anhedral, pink to milky white feldspar, 4% euhedral bronzy to black biotite, 1% amphibole; reaction to acid: no	very trace iron oxide staining (hematite and limonite), trace quartz vein	subangular chips up to 2.0 cm

APPENDIX B-1. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-03, DHRES-04 AND DHRES-05

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
6-Feb	DHRES-3	J. Kent	11.89	39	11.89	39	Completed setting up site, and set up to commence drilling. Set surface casing 7-5/8"; will let cement set up over night and start drilling at 6am tomorrow morning.	7-5/8"	Expect static water table for shallow alluvial system at~ 120' plan to drill below that depth turn off the beam pump and record base line production	Gila Conglomerate
8-Feb	DHRES-3	J. Kent	251.46	825	206.66	678	Drilling going very well, cleaned hole and took a survey deviation 2 degrees at 500ft. Did static and recovery tests. Drilled until 7:45am, tripped out of hole for a new bit (drilled on used bit for 10hrs). Tripping in with hammer assembly.	6-3/4" hammer reverse air	Ground water production at 422ft, 9.49GPM. Water production held steady at 80GPM from 442-582ft. 100GPM 582-602ft. 70GPM 622-642ft. 40GPM 642-742ft. No measurements taken from 742-822ft. 18GPM at 825ft after trip out/in (6.5hrs). Water level held steady at ~450ft after trip out/in. Water parameters PH=8.48 EC=541.0µS TDS=374.6ppm Temp=17.1C. Recovery test starting at 10pm 331.7ft, end depth at 10:30pm 320.89ft.	Gila Conglomerate

APPENDIX B-1. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-03, DHRES-04 AND DHRES-05

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
9-Feb	DHRES-3	J. Kent	451.71	1482	200.25	657	Drilling going very well, took two deviation surveys @ 1002ft 1.5°, and 1360ft 1.5°. Attempted a recovery test at 10am, but there was no circulation. Got circulation back, there was a clogged up alligator sub blocking the air.	6-3/4" hammer reverse air	Ground water production from 842-862ft, 7.5GPM. 20GPM 882-902ft. 53GPM 902-922ft. 27GPM 942-1062ft. 16GPM 1082-1102ft. 35GPM 1102-1202ft. 46GPM 1222-1242ft. 13GPM 1302-1442ft. Did not get a GPM reading at 1482ft due to equipment problems. Water parameters @ 1400ft PH=8.97 EC=560.4µS Temp=14.2C TDS=390.2ppm.	Gila Conglomerate
10-Feb	DHRES-3	J. Kent	579.73	1902	128.02	420	Drilling going well, took two deviation surveys @ 1562ft .75°, and 1762ft 1°. Attempted two recovery test at 9:30pm and 11am, only got results from one.	6-3/4" hammer reverse air	Ground water production from 1522-1542ft, 17GPM. 1562-1582ft 20GPM. 1602-1622ft 26.9GPM. 1642-1662ft 32GPM. 1682-1702ft 40GPM. 1762-1782ft 18GPM. 1782-1802ft 48GPM. 1802-1882ft 60GPM. Shut air off for recovery test at 11:03am, first water level reading taken at 11:20am 841ft. Last water level reading taken at 12:03pm 473ft. Water parameters @ 1902ft PH=8.41 EC=388µS Temp=31.2C TDS=254.	Gila Conglomerate and Picket Post Mtn. Volcanics (PPMV) contact @ 1702ft. PPMV sequence down hole thus far: rhyodacite tuff (1770-1830ft), sandstone (1830-1850ft), basalt.
11-Feb	DHRES-3	J. Kent	598.02	1962	18.29	60	Drilled to 1962ft, bit was used up, decided to trip out and switch over to conventional mud with a tri-cone bit.	6-3/4" hammer reverse air	Water production from 1922-1942ft, 80.7GPM. Measured water level after rod tip (hole open for ~12hrs) 455.1ft.	Picket Post Mtn. Volcanics

APPENDIX B-1. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-03, DHRES-04 AND DHRES-05

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
12-Feb	DHRES-3	J. Kent	598.02	1962	0.00	0	Set up tri-cone assembly, and tripped in with 4-1/2" rods. Began pumping mud down hole, unable to get circulation. Pumped ~28,000gal of mud, pressure was building on the mud tank gauge but still no circulation. Current plan is to trip out of the hole, and pour in a thick lost circulation material from the surface, unable to pump this material through the mud system.	6-1/2" tri-cone conventional mud	No testing/measurements were done.	Picket Post Mtn. Volcanics
13-Feb	DHRES-3	J. Kent	598.02	1962	0.00	0	Completed tripping rods and tri-cone assembly out of the hole. Pumped down 20 bags of hole plug and thick mud from surface; plugged up lost circulation zone. While tripping back in the hole they hit a bridge at 440ft, broke through the bridge and lost circulation. Decision was made to trip back out of the hole and pump down more hole plug to regain circulation. Crew tripped back out of the hole and ran in with the sounder to check the water level; sounder was getting hung up on residual mud on the walls of the hole. Pumped ~500gal of water to clean up the hole; the water returned to the surface (circulation was back). Tipped back in the hole and circulated every 100ft down to 1962ft. Full returns for 1.5hrs, then lost returns again. Decision was made to mix up a low vis mud and begin tripping out while displacing the mud in preparation for geophysical logging.Started logging at 1900 Hr.	6-1/2" tri-cone conventional mud	Temp at 1962' -- 35 C	Picket Post Mtn. Volcanics
16-Feb	DHRES-4	J. Kent	0.00	0	0.00	0	Prepped the site for reconfiguration of the drill rig and deck; positioned the drill rig and deck. Leveled the rig and deck and stood the mast up. Currently making final inspections before setting up to drill and set the casing. Drilling will commence at 1700hrs. Surface casing will be set and cemented in this evening; will let cement set up over night and commence drilling at 0600hrs.	19" direct air	N/A	Gila Conglomerate

APPENDIX B-1. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-03, DHRES-04 AND DHRES-05

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
17-Feb	DHRES-4	J. Kent	12.19	40	12.19	40.00	Drilled and set surface casing to 40ft; finished cementing casing at 0330hrs, let cement set up for 9 1/2 hrs. Crew worked and made final adjustments to the site while the cement set up. Starting tripping tools in at 1300hrs, currently drilling 12-1/4" bore hole.	12-1/4" Conventional Mud	N/A	Gila Conglomerate
18-Feb	DHRES-4	J. Kent	109.12	358	96.93	318.00	Drilling going well, took a deviation survey @ 400ft, .75°.	12-1/4" Conventional Mud	Full mud returns.	Gila Conglomerate
19-Feb	DHRES-4	J. Kent	203.61	668	94.49	310.00	Drilling going well, lost circulation at 490ft @ 1900hrs. Mixed and pumped down new batch of thick mud with lost circulation material and plugged up the zone. Took a deviation survey @ 598ft, .75°. Fighting minor lost circulation zones between 500-540ft.	12-1/4" Conventional Mud	Lost circulation at 498ft, and minor lost circulation zones between 500-540ft. Currently drilling with full returns.	Gila Conglomerate
20-Feb	DHRES-4	J. Kent	305.71	1003	102.11	335.00	Drilling going well, took two deviation surveys @ 798ft 1°, and 998ft 0°.	12-1/4" Conventional Mud	Drilling with full returns.	Gila Conglomerate
21-Feb	DHRES-4	J. Kent	413.00	1355	107.29	352.00	Drilling going well, took deviation survey @ 1198ft 0°. Decision was made to drill until the bit life is up ~15hrs, or until we reach 1500ft. Anticipate reaching TD of the upper portion of the well late tonight; crew will then trip out and set up to cement in the 7 5/8" casing.	12-1/4" Conventional Mud	Drilling with full returns.	Gila Conglomerate
22-Feb	DHRES-4	J. Kent	462.99	1519	49.99	164.00	Drilling going well, took two deviation surveys @ 1395ft 2°, and 1519ft 1°. TD the upper portion of the well @ 1519ft, and tripped tri-cone assembly out of the hole. Set up and started tripping in 7-5/8" casing, centralizers, and grout shoe. When 7-5/8" casing is tripped in completely (~6-7hrs), they will trip in the BQ rods with the stinger and lock into the grout shoe. They will then circulate on the hole to make sure that the gout shoe, stinger, and 7-5/8" casings are sealed off. Anticipate cementing early in the morning.	12-1/4" Conventional Mud	Drilled with full returns.	Gila Conglomerate

APPENDIX B-1. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-03, DHRES-04 AND DHRES-05

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
23-Feb	DHRES-4	J. Kent	462.99	1519	0.00	0.00	Lowered 7-5/8" casing to 1508.95ft, and ran stinger and BQ rods down the inside of the 7-5/8" casing to the grout shoe. Set up and circulated on hole with mud, full returns. Completed cementing the 7-5/8" casing this morning at 0945hrs. Tripped out all BQ rods. Cement will set for 12hrs; crew will get site and drill rig ready to start drilling 6-3/4" bore hole for the lower portion of the well.	12-1/4" Conventional Mud	Cement returned to the surface, 20 super sacks (1 super sack=180gal). Added bentonite to the cement to retard it and slightly lighten it (bentonite+super sack=220gal).	Gila Conglomerate
24-Feb	DHRES-4	J. Kent	496.82	1630	33.83	111.00	Crew tried to cement up DHRES-3 but could not get the cement back to surface. Decision was made to let the cement in the hole set up, and try to cement the rest of the well after the completion of DHRES-4. Crew set up site and rig to drill with a 6-3/4" tricone bit reverse air. Drilling started out going well, plugged up tri-cone bit at 1500hrs. Tripping out of hole to switch out tri-cone bit.	6-1/2" tri-cone reverse air	Making trace amounts of water.	Gila Conglomerate
25-Feb	DHRES-4	J. Kent	579.12	1900	82.30	270.00	Tripped out and switched out bit, tripped back in and resumed drilling. Drilling going well, took a deviation survey @ 1800 3.50°. Drilling has slowed down due to a change in formation, averaging ~1rod per hour.	6-1/2" tri-cone reverse air	Ground water production at 1740-1800ft 3GPM. 13GPM 1800-1820ft. 42GPM 1820-1840ft. 55GPM 1840-1880ft. 66GPM 1880-1900ft.	Gila Conglomerate and Picket Post Mtn. Volcanics (PPMV) contact @ 1790ft. PPMV sequence down hole thus far: rhyodacite tuff (1790-1850ft), sandstone (1850-1875ft), basalt.
26-Feb	DHRES-4	J. Kent	713.23	2340	134.11	440.00	Drilling is going very well, took two deviation survey's @ 2000ft 5°, and 2220 3°. TD the hole at 1400hrs (total depth 2340ft), currently tripping out of the hole in preparation for geophysical logging. Southwest Exploration will be on site at 1800hrs.	6-1/2" tri-cone reverse air	Ground water production at 1900-1940ft 55GPM. 66GPM 1940-2060ft. 58GPM 2060-2100ft. 83GPM 2100-2280ft. 67GPM 2280-2320ft. 55GPM 2320-2340ft. Water parameters @ 2340ft PH=8.68 EC=442.9µS Temp=34.2C TDS=272.1ppm.	PPMV. Drilled through several basalt flows with paleosols in between the flows. Ended hole in basalt.

APPENDIX B-1. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-03, DHRES-04 AND DHRES-05

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
27-Feb	DHRES-4	J. Kent	713.23	2340	0.00	0.00	Southwest Exploration completed geophysical logging at 0600hrs. Had to trip rods in the hole last night to 1540ft, then lower the geophysical tools down to get by a bad spot at 1520ft (base of 12-1/4" borehole, start of 6-1/2" borehole). Crews tripped out the rods after the completion of the logging. Currently tripping in 4.5" blank and perforated rods into the production zone; we will run a 4hr air lift test and a 4hr recovery test this afternoon.	4.5" blank and perforated rods	N/A	PPMV (Basalt)
1-Mar	DHRES-5	J. Kent	6.10	20	6.10	20.00	Completed setting up site, and set up to commence drilling for surface casing. Drilled and set in 20ft of 14" surface casing; completed cementing surface casing in at 0300hrs. Setting up to drill 12-1/4" borehole, drilling will start around 1230hrs.	Set 14" surface casing	N/A	Gila Conglomerate
2-Mar	DHRES-5	J. Kent	133.20	437	127.10	417	Drilling going well, took a deviation survey @ 300ft 2°.	12-1/4" Conventional Mud	Drilling with full returns.	Gila Conglomerate
3-Mar	DHRES-5	J. Kent	249.02	817	115.82	380	Drilling going well, took a deviation survey @ 600ft 1.5°.	12-1/4" Conventional Mud	Drilling with full returns.	Gila Conglomerate
4-Mar	DHRES-5	J. Kent	347.01	1138.5	97.99	321.5	Drilling going well, took a deviation survey @ 900ft 1.5°. Decision was made to TD the upper portion of the well this morning. Currently tripping out of the hole in preparation for geophysical logging. Southwest Exploration will be onsite at 1800hrs.	12-1/4" Conventional Mud	Drilling with full returns.	Gila Conglomerate and Picket Post Mtn. Volcanics (PPMV) contact @ 1090ft. PPMV went directly into basalt.
5-Mar	DHRES-5	J. Kent	347.01	1138.5	0.00	0	Southwest Exploration completed geophysical logging at 2030hrs. Tripped in 7-5/8" casing with centralizers to 1138ft; set up and tripped in grout shoe, stinger, and BQ rods to grout in casing. Successfully grouted in casing this morning @ 1200hrs, grout will set up for 18hrs before drilling will commence.	7-5/8" casing	Cement returned to the surface, 18 super sacks (1 super sack=190gal) were used. Added bentonite to the cement to retard it and slightly lighten it (bentonite+super sack=220gal).	PPMV

APPENDIX B-1. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-03, DHRES-04 AND DHRES-05

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
6-Mar	DHRES-5	J. Kent	396.85	1302	49.83	163.5	Let cement set up overnight and prepared to drill 6-3/4" reverse air, commenced drilling at 0645hrs. Drilling going well, took a deviation survey @ 1200ft .5°.	6-3/4" hammer reverse air	No water production.	PPMV
7-Mar	DHRES-5	J. Kent	622.40	2042	225.55	740	Drilling going well, took two deviation surveys @ 1500ft 2°, and 1800ft 1°. Bit life of hammer has 4hrs left on it; crew will trip bit out of the hole and trip back in with the tri-cone bit.	6-3/4" hammer reverse air	Water production from 1642-1682ft 11GPM. 1682-1742ft 8GPM. 1742-1802ft 12GPM. 1802-1882ft 7GPM. Trace water from 1882-2002ft. 2002-2042ft 7GPM.	PPMV and Gila Conglomerate contact at 1500ft.
8-Mar	DHRES-5	J. Kent	713.84	2342	91.44	300	Drilling going well, took a deviation survey @ 2100ft 1°. Hammer lasted until 2230hrs, tripped out of hole to replace hammer with a tri-cone bit. Currently tripping back into the hole; bridges in the hole are extending trip time. Anticipate drilling this evening.	6-1/2" tri-cone reverse air	Water production from 2042-2082ft 7GPM. 2082-2102ft 4GPM. 2102-2182ft 7GPM. 2182-2262 14GPM. 2262-2302 10GPM. 2302-2342 0GPM. Water parameters @ 2262ft PH=8.78 EC=831µS Temp=17.3C TDS=583.7ppm.	Gila Conglomerate
9-Mar	DHRES-5	J. Kent	804.06	2638	90.22	296	Reamed back to bottom and commenced drilling at 2100hrs. Drilling is going well, took a deviation survey @ 2400ft 3.25°.	6-1/2" tri-cone reverse air	Water production was trace from 2342-2438ft. 7GPM 2438-2538ft. Trace 2538-2638ft. Water parameters @ 2558ft PH=8.72 EC=582.8µS Temp=18.6C TDS=403.3ppm.	Gila Conglomerate
10-Mar	DHRES-5	J. Kent	919.89	3018	115.82	380	Drilling went well, total depth of the hole was 3018ft. Took a deviation survey @ 2700ft 6°. Currently tripping out of the hole, and setting up for geophysical logging. Southwest Exploration will be onsite @ 2000hrs.	6-1/2" tri-cone reverse air	Water production was trace from 2638-2678ft. 3GPM 2698-2818ft. 16GPM 2838-2858ft. 10GPM 2858-2998ft. Water parameters @ 2840ft PH=8.73 EC=574.5µS Temp=24.8C TDS=418.3ppm.	Gila Conglomerate

APPENDIX B-1. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-03, DHRES-04 AND DHRES-05

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
11-Mar	DHRES-5	J. Kent	919.89	3018	0.00	0	Completed running geophysical logs at 0530hrs. Set up and tripped in blank and slotted casing to complete the well.	4.5" blank and perforated rods	Southwest tagged the water level at 2500ft at 1200hrs; it recovered 200ft by 0430hrs.	Gila Conglomerate
12-Mar	DHRES-5	J. Kent	919.89	3018	0.00	0	Demobilization is underway, anticipate having the site cleared by this afternoon. BLY will be completely off site by Saturday.	Demobilizing	n/a	Gila Conglomerate

APPENDIX B-2. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-05 MODIFICATION

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
9-Aug	DHRES-5	E. Jung	0.00	0.00	0.00	0.00	Mobilization to DHRES-5 and site set up completed at 0800hrs. Site inspections completed by 1130hrs. Currently tripping in to thread on to back- out sub and remove 4 1/2" casing. Anticipate removal of casing by mid-morning. Geophysical logging will be conducted before drilling resumes.	4-1/2" Casing	N/A	Gila Conglomerate (Tg)
10-Aug	DHRES-5	A. Jergenson	0.00	0.00	0.00	0.00	Assembled tool string and tripped in to the top of the back off sub at 323m, tried to thread in. First attempt to thread in to the back off sub was unsuccessful. Tripped in and out two more times attempting to connect with no luck. Painted the pin end of the string, and tripped in to try and get an idea for where the pin and box ends are lining up. Currently tripping out. While trying to thread back in (reverse threads) crew's are being careful not to unthread the 4-1/2" liner that is connected the back off sub. Shipping down spear and other fishing tools (arriving tonight ~1800hrs). Current plan is to hook into the 4-1/2" casing and pull it out.	4-1/2" Casing	N/A	Gila Conglomerate (Tg)
11-Aug	DHRES-5	A. Jergenson	0.00	0.00	0.00	0.00	Received and assembled fishing tool (grapple). Ran in with tool assembly into the 4 1/2" casing and connected successfully. Tripped out 76 joints of casing until the hydraulics went out on in the head, ~1230hrs. Currently there are 19 joints remaining in the hole, and the crew will be using the wire line cable on the rig to trip out the remaining joints. Trouble shooting the hydraulic system. Anticipate geophysical logging to commence this evening.	4-1/2" Casing	N/A	Gila Conglomerate (Tg)

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
12-Aug	DHRES-5	A. Jergenson	and conti	0.00	0.00	0.00	Completed tripping out 4 1/2" casing and commenced geophysical logging at 1730hrs. Completed running three of the five logs due to a reduction in the hole diameter at 379.5m. Both the ABI and Sonic tools require centralizers that would not have fit through the reduced borehole diameter. Currently tripping in to drill 6-1/2" Tri-cone flooded reverse, anticipate commencing drilling this evening.	4-1/2" Casing	N/A	Gila Conglomerate (Tg)
13-Aug	DHRES-5	J.Kent	947.93	3110.00	28.04	92.00	Tripped into hole and commenced drilling at 0515hrs. Down for 3.5hrs working on rig. Drilling making good progress. The hole is not losing much water, and the penetration rate is ~1.5hrs per rod.	6-1/2" Tri-cone Flooded Reverse	Drilling utilizing water and no mud products. Currently the hole is not losing much water during drilling.	Gila Conglomerate (Tg)-Anticipate encountering a fault or Tal shortly.
14-Aug	DHRES-5	E. Jung	1018.03	3340.00	70.10	230.00	Drilling, making good progress. Took surveys at 944.83m Inc 6.75°, and 975.31m Inc 7.0°. Reduced weight on bit to correct inclination.	6-1/2" Tri-cone Flooded Reverse	Drilling utilizing water and no mud products. Currently the hole is not losing much water during drilling.	Gila Conglomerate (Tg) to 950.9m. Apache Leap Tuff (Tal) from 950.9m - 1018m. Gray dacite tuff, 60% groundmass and 40% phenocrysts of quartz, feldspar, and brown-bronze biotites. Minor lithics of red-dark brown siltstone.
15-Aug	DHRES-5	A. Jergenson	1069.85	3510.00	51.82	170.00	Drilling making great progress. Took surveys at 1005.84m Inc 7.0°, and 1036.32m, Inc 6.75°. Penetration rate has remains at ~2 hours per rod.	6-1/2" Tri-cone Flooded Reverse	Drilling utilizing water and no mud products. Currently the hole is not losing much water during drilling.	Apache Leap Tuff (Tal) from 950.9m - 1069m. Gray dacite tuff, 60% groundmass and 40% phenocrysts of quartz, feldspar, and brown-bronze biotites. Minor lithics of red-dark brown siltstone.
16-Aug	DHRES-5	E. Jung	1100.33	3610.00	30.48	100.00	Drilling, making good progress. Took survey at 1066.75m Inc 6.75°. Penetration rate has decreased to 4hrs/rod.	6-1/2" Tri-cone Flooded Reverse	Drilling utilizing water and no mud products. Currently the hole is not losing much water during drilling.	Apache Leap Tuff (Tal) from 950.9m - 1069m. Gray dacite tuff, 60% groundmass and 40% phenocrysts of quartz, feldspar, and brown-bronze biotites. Minor lithics of red-dark brown siltstone.
17-Aug	DHRES-5	J.Kent	1127.76	3700.00	27.43	90.00	Drilling, making good progress. Took survey @ 1097m 6-3/4". Currently have 85hrs on the bit, going to trip out for a bit at 90hrs.	6-1/2" Tri-cone Flooded Reverse	N/A	Apache Leap Tuff (Tal)

APPENDIX B-2. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-05 MODIFICATION

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
18-Aug	DHRES-5	J.Kent	1136.60	3729.00	8.84	29.00	Drilled on bit for 92hrs, and then commenced tripping out of the hole at 2015hrs. Completed tripping out of hole and changing bit at 0800hrs. Currently tripping back into the hole. Anticipated drilling by this evening.	6-1/2" Tri-cone Flooded Reverse	N/A	Apache Leap Tuff (Tal)
19-Aug	DHRES-5	J.Kent	1160.98	3809.00	24.38	80.00	Completed tripping back into the hole at 1930hrs and commenced drilling. Took survey at 1127m Inc 6˚. Current penetration rate is between 2-4hrs.	6-1/2" Tri-cone Flooded Reverse	Drilling utilizing water and no mud products. Currently the hole is not losing much water during drilling.	Apache Leap Tuff (Tal)
20-Aug	DHRES-5	J.Kent	1208.23	3964.00	47.24	155.00	Drilling, making great progress. Took survey at 1158m Inc 6˚. Currently 16.5m away from TD; anticipate reaching TD by late tonight ~9-12hrs.	6-1/2" Tri-cone Flooded Reverse	Hole conditions are stable, minimal water loss.	Apache Leap Tuff (Tal)
21-Aug	DHRES-5	E. Jung	1224.69	4018.00	16.46	54.00	TD hole at 1224.69m, 2130hrs. Tripped out for geophysical logging. Southwest Exploration on site 1300hrs today. Currently logging hole.	6-1/2" Open hole	N/A	Apache Leap Tuff (Tal)
22-Aug	DHRES-5	E. Jung	1224.69	4018.00	0.00	0.00	Southwest Exploration conducted geophysical logging from 1300hrs - 2130hrs. All tools were run successfully. Schlumberger was scheduled to run FMI tool at 2200hrs, however, logging team has been delayed until late tonight or early tomorrow. Crew is currently organizing/measuring casing, etc. in preparation for well completion.	6-1/2" Open hole	N/A	Apache Leap Tuff (Tal)
23-Aug	DHRES-5	E. Jung	1224.69	4018.00	0.00	0.00	Crew has been on standby from 2130hrs Saturday night, waiting for geophysical logging team to arrive. Logging team arrived 1600hrs (8-23-10). Currently setting up for logging.	6-1/2" Open hole	N/A	Apache Leap Tuff (Tal)

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
24-Aug	DHRES-5	J.Kent	1224.69	4018.00	0.00	0.00	Commenced geophysical logging at 1830hrs with the FMI tool. Logged hole from 1224m to 843m before the tool became stuck in the hole. Tool became stuck in the hole because of possible slough (rock) that fell in on top of it. Crew worked on pulling up the tool for 3.5hrs before working it free. Recovered the tool and tripped into the hole with the drill string to clean it up. Currently tripping out of the hole, anticipate geophysical logging to start late tonight.	6-1/2" Open hole	N/A	Apache Leap Tuff (Tal)
25-Aug	DHRES-5	J.Kent	1224.69	4018.00	0.00	0.00	Completed tripping out of the hole at 2200hrs, and set up for geophysical logging. Commenced geophysical logging at 0000hrs. Successfully completed logging the hole from 1224m to 348m (base of 7-5/8" casing) this morning. Crew currently tripping in 4-1/2" blank and perf. casing according to M&A's well completion schedule.	4-1/2" Blank and Perf Casing	N/A	Apache Leap Tuff (Tal)
26-Aug	DHRES-5	A. Jergenson	1224.69	4018.00	0.00	0.00	Tripped 4.5" casing with packers, cement baskets, and the casing hanger as per M&A well design. While lowering the casing string into the hole the thread saver and drill rod separated causing the casing sting, plus 22 drill rods, to fall ~213m down the hole at 0530hrs. Drill crew then tripped into the hole and threaded back onto the 5.5" drill rods. While threading back onto the drill rods the crew backed off the casing hanger and the entire casing sting was set ~7.3m lower than design. Current plan is to trip AQ pipe down through the casing string to confirm that there is nothing blocking the interior of the casing/packers.	4-1/2" Blank and Perf Casing	The casing hanger securing the 4.5" liner is set at 337.9m(top). The remaining 4.5" liner consisting of two steel cement baskets, two packers, and blank/perforated steel 4.5" casing is now set in compression at 1224.7m.	Apache Leap Tuff (Tal)

APPENDIX B-2. DAILY DRILLING REPORT SUMMARY FOR HYDROLOGIC TEST WELLS DHRES-05 MODIFICATION

Date	Hole #	Reporter	Shift Change Depth (m)	Shift Change Depth (ft)	Progress in last 24 Hrs (m)	Progress in last 24 Hrs (ft)	Comments	Hole Type/Size	Hydro Data	Geology
27-Aug	DHRES-5	E. Jung	1224.69	4018.00	0.00	0.00	Tripped in AQ pipe and confirmed that there was nothing blocking the interior of the casing/packers. Conducted air-lift test at 164.58m for 1/2 hour (0500hrs)- well could not produce enough to continue test. Tripped in to 274.3m and unloaded hole. Measured recovery for 2hrs. currently tripping out AQ pipe and breaking down site for demobilization.	Demobilization	Well could not produce enough to continue air-lift test more than 1/2 hr. Tripped in to 274.3m and unloaded hole. Measured recovery for 2hrs - well has extremely slow recharge rate. Drilling this well required injection of water, so correct static water level unknown.	Apache Leap Tuff (Tal)
28-Aug	DHRES-5	E. Jung	1224.69	4018.00	0.00	0.00	DHRES-5 is complete and well head is secure. Breaking down site and mobilizing to DHRES-10 (Shaft #8). Anticipate complete site set-up by Tuesday morning.	Demobilization	N/A	Apache Leap Tuff (Tal)