

SAMPLING AND ANALYSIS PLAN

Section 3.0

Topography

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New Mexico Mining and Minerals Division
&
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3.0 Topography

3.1 Introduction and Background

Topographic features of the Roca Honda permit area and the permit area are shown in Figure 3-1. Figure 3-1 also shows the permit area and the location of all buildings within a half-mile of the permit area and all man-made features within the permit area. The base map for this figure was prepared from two 1:24,000 scale U.S. Geological Survey (USGS) 7.5-minute topographic maps – San Mateo and San Lucas Dam (1995 editions). Nearly all of the Roca Honda permit area, except for the extreme north parts of Sections 9 and 10, is covered by the San Mateo topographic map. The extreme north ends of Sections 9 and 10 are covered by the San Lucas Dam topographic map. Features on both maps are based on imagery taken in 1991 and 1993.

The roads, ponds and all the power lines except the one in Section 16 shown on Figure 3-1, were compiled using USGS topographic maps. The location of the power line shown in Section 16 was obtained from the description in the easement provided by the electrical company. More recent features were added to the topographic map using Environmental Systems Research Institute (ESRI) software to view aerial photographs taken in 2005 as part of the National Agricultural Imaging Program (NAIP) (<http://165.221.201.14/NAIP.html>). These more recent features are shown in Figure 3-1 and discussed below. Additionally, Figure 3-2 is a recent aerial photograph of the permit area that provides a realistic view of current conditions of the area.

Man-made features inside the Roca Honda permit area include overhead power lines, two ponds, a weather station, an air monitoring station, and three monitor wells. The wells were drilled in 2007. The two small stock ponds are located in Section 16 of the Roca Honda permit area: one in a small canyon near the south boundary (which has been breached), and one just northeast of the center of the section. There are no buildings within the permit area.

The only buildings within the half mile margin around the permit area are buildings associated with the Lee Ranch shop facilities in the NE $\frac{1}{4}$ Section 17. This is also the location of what is shown on some maps as the “Lee Mine”. The mine shaft was never completed and the mine never operated. Other man-made features within the half mile margin of the permit area include a small fenced area northeast of the Lee Ranch shop facilities, an old windmill just east of the Lee Ranch shop facilities buildings and a former pond east of the windmill, a small pond and cleared area (formerly Bull Pasture Tank) south of the Lee Ranch shop facilities, a small pond along the Cañada Las Vacas in the south-central part of Section 3, a berm area (formerly San Mateo pond) in the NW $\frac{1}{4}$ Section 11, and a berm area (formerly Buck Tank) in the SW $\frac{1}{4}$ Section 15. Also within the half-mile margin outside the permit area is a pair of northwest-oriented overhead power lines northeast of Section 10 and an overhead power line that extends south from the southeast corner of Section 10 and then extends southwest through the NW $\frac{1}{4}$ Section 22.

Additional man-made features just outside the half-mile margin around the permit area include the several buildings of the Lee Ranch in the NE $\frac{1}{4}$ Section 22 and State Highway 605 less than 1 mile south of the permit area.

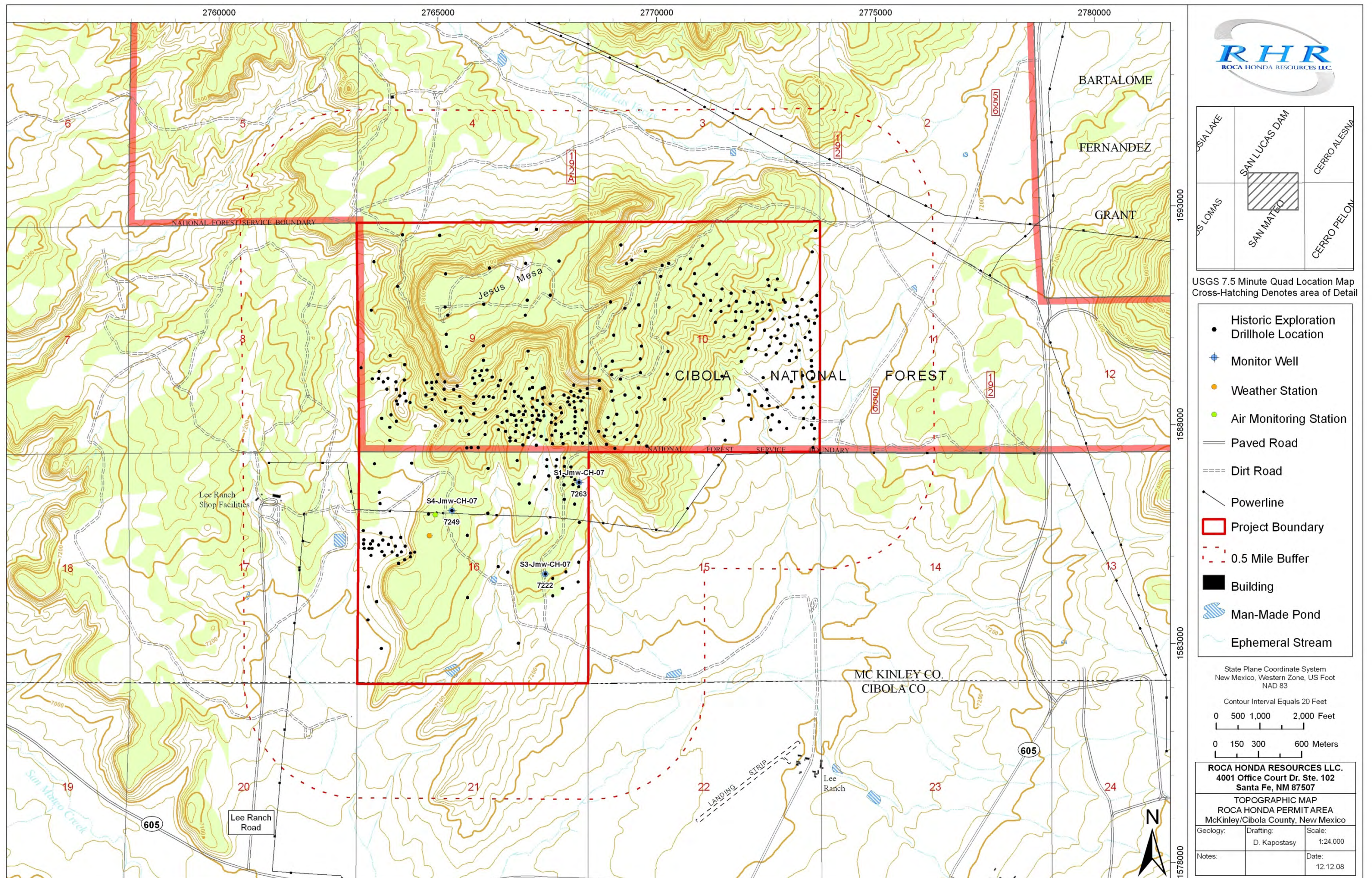


Figure 3-1. Topographic Base Map Showing the Proposed Permit Area (1:24,000)

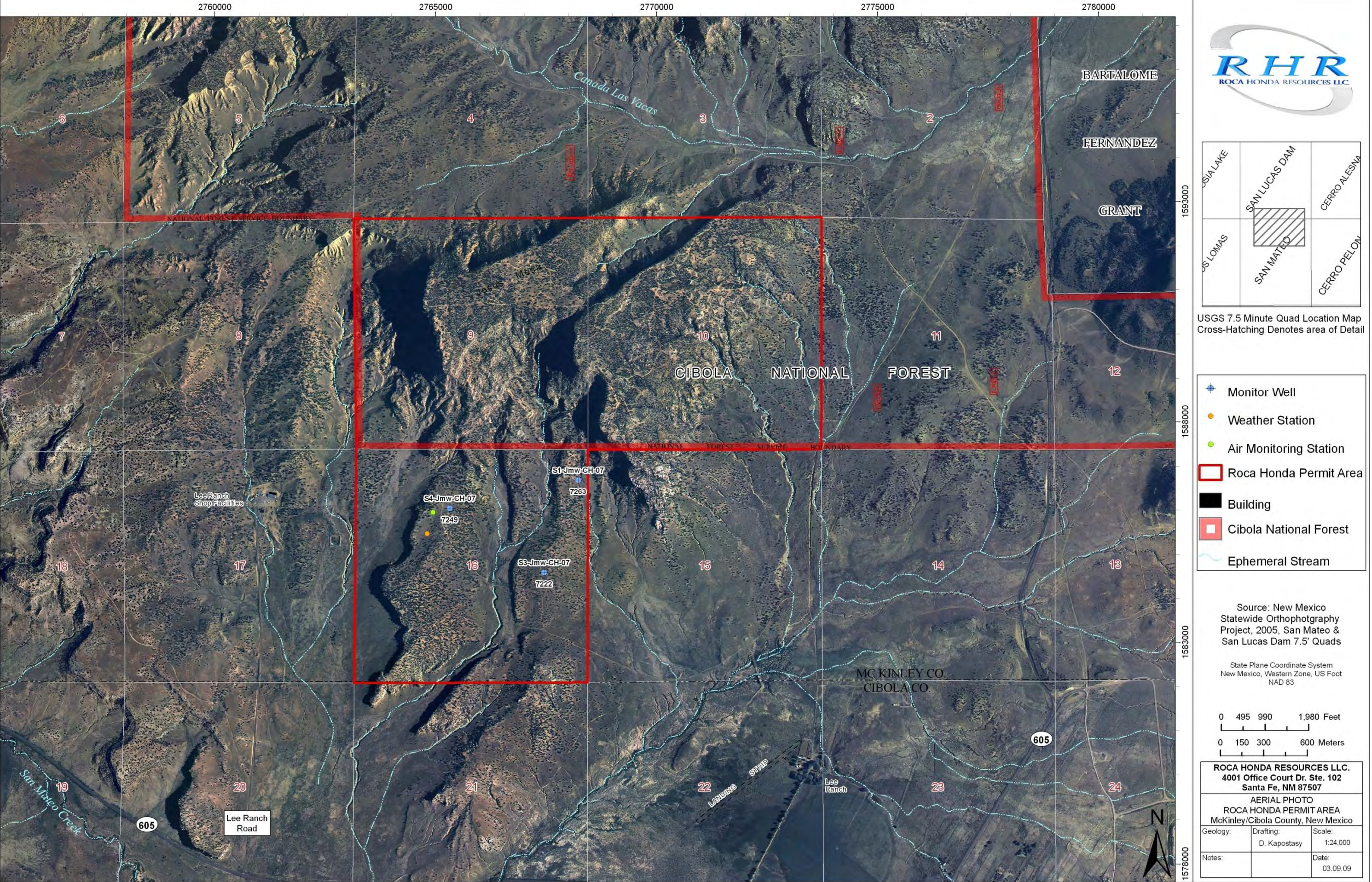


Figure 3-2. Aerial Photo Base Map Showing the Proposed Permit Area (1:24,000)

3.2 Sampling Objectives

The objectives of the proposed data collection are to characterize and establish baseline topographic conditions across the Roca Honda permit area in advance of mining and to supplement existing topographic data.

3.3 List of Data to be Collected

Three data needs identified for topography are summarized in Table 3–1 along with the proposed investigation to fill those needs.

Table 3–1. Data Needs Identified for Topography

Data Need	Plan to Address Data Need
Verification of the man-made features in the Roca Honda permit area and in the half-mile margin around the permit area is needed, including confirmation of extent of power lines outside Section 16.	Field investigation of the Roca Honda permit area and the half-mile margin around the permit area will be conducted to verify the existence and location of the man-made features.
Contours for engineering design.	New aerial photographs have been flown and appropriate interval contour maps will be developed as needed for engineering design.
Stream bed contours for discharge engineering decisions.	The pre-mining stream channel morphology will be defined in more detail, including channel plan, profile, and cross-section using aerial photographs and/or conventional survey techniques.

3.4 Methods of Collection

Field surveys will be conducted across the permit area and within a half mile margin of the permit area to verify the existence and location of manmade objects. These surveys will be coordinated with other field work.

New aerial photographs were completed in 2008 and used to prepare contour maps with a 5-foot topographic interval. These maps will support engineering designs.

The pre-mining stream channel morphology will be defined in more detail, including channel plan, profile, and cross-section using these aerial photographs and/or conventional survey techniques. These pre-mining data will be used to aide in designing reclamation channels, where necessary, that are naturally stable.

3.5 Parameters to be Analyzed

The permit area baseline topography including drainages and man-made features will be considered parameters to be analyzed.

3.6 Maps Providing Sampling Locations

See Figure 3-1 for topographic map and man-made features within ½ mile of the permit area. See also Figure 3-2 for an aerial photograph perspective.

3.7 Sampling Frequency

Field surveys to verify man-made features will be performed during other field activities during 2008 and 2009. The new aerial photography and surface contours was conducted in late 2008.

3.8 Laboratory and Field Quality Assurance Plan

There will be no analytical laboratory requirements for the topography field work. RHR may utilize subcontractors to assist with gathering updated information for the baseline topographic condition in the permit area. Licensed field surveyors and aerial photographers will be selected based on their qualifications and certifications. Subcontractors and in-house personnel will follow QA/QC procedures as described in the Field Quality Assurance Plan (FQAP). The RHR Task Manager or designee will select a coordinate system consistent with State requirements in order to relate all base maps and surface features to the same system. The various Field Leaders will verify the existence and location of manmade features as they walk the permit area for other data collection activities. If necessary, the features or objects will be tied to the nearest bench mark. The new digitized aerial photograph and derived contours will be used for design, baseline data presentation, and baseline conditions for reclamation and re-vegetation.

3.9 Brief Discussion Supporting Proposal

The objectives of the proposed data collection are to verify the existence, condition, and use of features within and immediately around the permit area. This baseline data will assist in the design of the facility location, any required mitigations concerning existing features, and the reclamation and replacement of features. The new aerials and contours will assist in the design enhancements or alterations to the surface drainages for water discharges. The more accurate contours will result in a more accurate grading plan for construction and for reclamation.

3.10 References

None