APPENDIX E SUMMARY OF LARA MODEL MEMORANDUM

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memorandum

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to County of San Diego Department of Planning and Development Services
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subject Summary of LARA Model for the El Monte Sand Mining Project,
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Introduction and Summary

This memorandum outlines the County of San Diego's (County) Local Agricultural Resource Assessment (LARA) Model results as it applies to the El Monte Sand Mining Project. This memo includes an overview of the proposed project and the LARA Model, a summary of the LARA Model results, and an explanation of how the LARA Model results were determined.

The LARA Model's determination for the project site is that it is not a significant agricultural resource. The factors that led to this determination are described below. Primarily, the project site does not have a reliable water source for agricultural purposes, which greatly decreases its viability as an agricultural site.

Overview of the Proposed Project

The proposed project would extract approximately 12.5 million tons of aggregate material for commercial use. The surface mine would operate over a 16-year period, with 12 years of active mining, subject to market conditions. After mining is complete, the project would implement a Reclamation Plan that would reclaim mined lands to beneficial alternate end uses including habitat creation/restoration of open space and a recreational/equestrian trail network.

Overview of the Site

The project site is currently vacant. Although the current vegetation within the project site is primarily composed of exotic species, some native vegetation is sparsely scattered throughout the site. Riparian ecological functions on-site have been diminished as a result of previous disturbances to the project area. Disturbances include previous sand mining, agriculture, partial grading for the El Capitan Golf Course project, and the reduced water flow caused by the El Capitan Dam (located approximately 2 miles east of the Project site). In 1999, the project site was approved as the location for the El Capitan Golf Course project, and from 2003 to 2005, some preliminary grading activities were conducted onsite. In 2005, grading activities were terminated and the Golf Course project was abandoned. Sand mining operations that occurred on-site approximately 30 years ago created a clearly defined river channel, which varies in width from 250 feet to nearly 400 feet. The channel is typically 10 to 20 feet lower than the elevations of the surrounding lands. The groundwater surface within the project site is estimated to be an average of 36 to 41feet below ground surface.

Application Summary of LARA Model

Application of the LARA model is intended for use in evaluating the importance of agricultural resources when it is determined that a discretionary project could adversely impact agricultural resources located onsite. The LARA Model takes into account the following factors in determining the importance of the agricultural resource:

Required Factors

- Water
- Climate
- Soil Quality

Complementary Factors

- Surrounding Land Uses
- Land Use Consistency
- Topography

This analysis will follow the County's *Guidelines for Determining Significance: Agricultural Resources (Guidelines)* to determine a rating for the both the required and complementary factors, and a determination of the agricultural resource significance of the project site.

Summary of LARA Model Results

To determine the agricultural significance of the project site, the County's *Guidelines* provides the following matrix (**Table 1**), Interpretation of LARA Model Results. These summarized finding are described and expanded upon in the following sections of this memorandum.

TABLE 1
INTERPRETATION OF LARA MODEL RESULTS

	LARA Model Results		
Possible Scenarios	**Required Factors**	**Complementary Factors**	**LARA Model Interpretation**
Scenario 1	All three factors rated high	At least one factor rated high or moderate	The site is an important agricultural resource
Scenario 2	Two factors rated high, one factor rated moderate	At least two factors rated high or moderate	
Scenario 3	One factor rated high, two factors rated moderate	At least two factors rated high	
Scenario 4	All factors rated moderate	All factors rated high	
Scenario 5	At least one factor rated low	N/A	The site is not an important agricultural resource
Scenario 6	All other model results		

Table 2, below, provides the LARA Model results for the proposed project. As one required factor is rated low, the proposed project site falls within Scenario 5 and is not an important agricultural resource.

TABLE 2
LARA MODEL RESULTS

Required Factor	Rating
Water	Low
Climate	High
Soil Quality	High
Complementary Factor	
Surrounding Land Use	High
Land Use Consistency	Low
Slope	Moderate
Interpretation	
This site is not an important agricultural resource.	Scenario 5

Because the LARA Model results indicate that the project site is not an important agricultural resource, this memorandum will be used to support the agricultural impacts analysis in the Draft Environmental Impact Report that the County is preparing for the proposed project. The County has reviewed this memorandum and concurs with the results of the LARA Model analysis. Therefore, no further technical documentation of agricultural resources will be required.

Explanation of LARA Model Results

As mentioned above, ratings for water, climate, and soil quality are required to determine whether or not the project site is a significant agricultural resource. The following explanation of the LARA Model results for the El Monte project includes these three required factors, as well as the three complementary factors: surrounding land use, land use consistency, and slope. This discussion provides the rating for each as well as the information that supports the rating determination.

Required Factors

Water

The LARA Model water rating is based on a combination of the site's County Water Authority (CWA) service status, the underlying groundwater aquifer type, and the presence of a groundwater well. The project falls into the service status category "Outside CWA or inside CWA but infrastructure connections are not available at the site and no meter is installed," since the project site is within the CWA service area, but does not currently have infrastructure connections available. **Figure 1** shows the existing wells that are located with the project site boundary. The project site is located in an alluvial or sedimentary aquifer and has 14 existing wells, which consist of municipal wells, private wells, and well of unknown sources. There is also well 101 located southwest of the project site boundary which currently provides raw water to the nearby R.M. Levy Water Treatment Plant. The groundwater from all wells onsite would not be used for the proposed project. Instead, water for processing, dust control, and any irrigation would be supplied by Helix Water District. Although water is not being sourced from the groundwater wells, the presence of the wells is still being considered as a conservative approach in order to perform the most accurate analysis. Thus, the location of the proposed project within the CWA, the presence of wells, and the location on an aquifer would imply the water rating is moderate. However, the *Guidelines* provide for a rating reduction if there is evidence of a groundwater quantity or quality limitation. According to the *Guidelines* such a limitation exists if, "the site has inadequate cumulative well yield (<1.9 gpm per acre of irrigated crops); TDS levels above 600 mg/L; or another documented agricultural water quality or quantity limitation exists."

In the *Feasibility Study for the El Monte Valley Recharge Project*, Black & Veatch noted that the groundwater in the El Monte Valley has very high alkalinity, hardness, total dissolved solids (TDS), iron, manganese, and sulfate, with relatively high total organic carbon (TOC). The TDS concentration ranges from 430 – 2600 mg/L for the El Monte Valley.[1] TDS levels for the El Monte Valley are above the 600 mg/L recommended by the *Guidelines.* According to the *Guidelines,* while TDS levels above 500 mg/L are problematic for many of the subtropical crops produced in San Diego County, concentrations above 600 mg/L was selected as the guideline to take into account the already elevated TDS concentrations in imported water sources. Groundwater in the El Monte Valley was also found to have high arsenic concentrations, and like any other heavy metal, arsenic is toxic to plants and animals.

Helix Water District reported that Well 101 experiences problems with screens clogging from iron bacteria that progressively reduce production. However, the District implements a maintenance program with two to three year cycles to maintain and clean the well column in order to stabilize production.[2] Iron bacteria are micro-organisms which obtain energy by oxidizing soluble ferrous iron into insoluble ferric iron, which then precipitates out of solution.[3] The prevalence of iron bacteria can be problematic in wells used for irrigation because iron bacteria can clog well cases, screens, or aquifers, which can cause blockages, pumping inefficiency, and the overheating and breakdown of pumps. Iron bacteria indicates a high level of iron in the water, and while not problematic on its own, high concentrations of iron in irrigation water can oxidize on contact with the air and block drippers, filters and spray nozzles and contribute to scale build up in the pipes resulting in decreased efficiency, increased maintenance, and expensive replacement of dripper nozzles.[4]

Groundwater in the El Monte Valley has high alkalinity and hardness, TDS concentration, and arsenic, iron, manganese and sulfate levels. Alkalinity levels above 100 mg/L are considered high and not within the desirable range for irrigation water (UMass Amherst, 2016). TDS concentrations are known to be above the recommended 600 mg/L as per County *Guidelines*. Historical groundwater samples prove that the water quality in the project site has high alkalinity and TDS levels. A study done by Earth Tech in 1998 included groundwater sample results taken from three pumping wells (PW-1, PW-2, and El Monte #14) located on the central and western portions of the project site (as shown in Figure 1). These results showed that the project site had measured alkalinity levels of 130, 183, and 151 mg/L and TDS levels of 330, 686, and 490 mg/L, respectively (Earth Tech, 1998). Also, Well 101 has a history of clogged screens because of iron bacteria. These factors would cause severe problems for agricultural production. However, a groundwater evaluation report conducted by AECOM in October 2016 showed that the TDS concentrations within the project site were below 600 mg/L. TDS measurements were taken from three different wells (Well 1, 2, and 3, shown in Figure 1) located in the western, central, and eastern areas of the project site where the results showed TDS concentrations of 350, 550, and 550 mg/L, respectively. Thus,

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1 Black & Veatch, *El Monte Valley Recharge Project Final Feasibility Study,* April 2006.

2 Helix Water District, Mr. Steve Geitz, electronic communications, September 1, 2015

3 Omni Enviro Water Systems, *Irrigation and Iron Bacteria,* http://www.omnienviro.com/agriculture/irrigation.php; accessed on December 16, 2010.

4 Ibid.

the water quality limitation per the *Guidelines* would not apply, and the water rating would remain as moderate. However, the project site does not have infrastructure connections to the CWA service area. According to the County's *Guidelines*, extending infrastructure to areas without water infrastructure would be costly, and would not receive a water rating as high as sites that have existing water infrastructure connections. Due to not having water infrastructure, the project site does not have a reliable water source for agricultural purposes, which greatly decreases its viability as an agricultural site. In addition, the proposed project would abandon all onsite wells and not use any groundwater. Therefore, there is justification to reduce the water rating from moderate to low.

Climate

The proposed project is in Generalized Western Plant climate Zone 21. According to the County's *Guidelines,* Zone 21 is an air-drained thermal belt that is good for citrus and is the mildest zone that gets adequate winter chilling for some plants. The low temperatures within this zone range from 23 to 36 degrees Fahrenheit (F), with temperatures rarely dropping far below 30 degrees F. Zone 21 has a high rating according to the LARA Model.

Zone 21 is rated high because of the mild year-round temperatures and lack of freezing temperatures that allow year round production of high value crops. The importance of this zone is also related to the conversion pressure that exists due to urban encroachment. The loss of significant agricultural lands in Zone 21 would eventually relegate agriculture to areas further east where most of the County's high value crops cannot be viably produced.

Soil Quality

The project's soil quality rating is based on the presence of Prime Farmland Soils or Soils of Statewide Significance that are available for agricultural use and that have been previously used for agriculture. Land covered by structures, roads, or other uses are not typically considered in the soil quality rating. To determine the soil quality rating, the soil types on the project site must be identified and entered into the Soil Quality Matrix as outlined in the *Guidelines*. The project's Soil Quality Matrix is shown below, in **Table 3**. As shown in Table 3, the project's Soil Quality Matrix score is 0.69, which means the project has a high rating for soil quality. **Table 4** contains the Soil Quality Matrix Interpretation.

TABLE 3
SOIL QUALITY MATRIX

	Column A	Column B	Column C	Column D	Column E	Column F	Column G
	Soil Type	Size of project site (acreage)	Unavailable for agricultural use	Available for agricultural use	Proportion of project site	Is soil candidate for prime farmland or farmland of statewide significance? (Yes = 1, No = 0)	Multiply Column E by Column F
Row 1	AcG	0.92	0	0.92	0.00	0	0
Row 2	CnG2	1.82	0.39	1.43	0.00	0	0
Row 3	FxG	12.81	1.64	11.17	0.03	0	0
Row 4	Rm	146.25	22.45	123.8	0.28	0	0
Row 5	TuB	294.55	21.27	273.28	0.62	1	0.62
Row 6	VaA	32.66	0	32.66	0.07	1	0.07
Row 7	VaB	0.3	0	0.3	0.00	1	0.00
	Total	**489.31**	**Total**	**443.56**		**Soil Quality Matrix Score**	**0.69**

TABLE 4
SOIL QUALITY MATRIX INTERPRETATION

Soil Quality Matrix Score	Soil Quality Rating
The site has a Soil Quality Matrix score ranging from 0.66 to 1.0 and has a minimum of 10 acres of contiguous Prime Farmland or Statewide Importance Soils.	High
The site has a Soil Quality Matrix score ranging from 0.33 to 0.66 or the site has a minimum of 10 acres of contiguous Prime Farmland or Statewide Importance Soils.	Moderate
The site has a Soil Quality Matrix score less than 0.33 and does not have 10 acres or more of contiguous Prime Farmland or Statewide Importance Soils.	Low

Complementary Factors

Surrounding Land Use

Surrounding land use is a factor in determining the importance of an agricultural resource because surrounding land uses that are compatible with agriculture make a site more attractive for agricultural use due to lower expectations of nuisance issues and other potential impacts from non-farm neighbors. Surrounding land use is a complementary factor in the LARA model because the presence of compatible surrounding land use can support the viability of an agricultural operation; however, a lack of compatible surrounding land uses would not usually prohibit productive agriculture from taking place.

Land use in the El Monte Valley is limited by physical constraints and the presence of the San Diego River floodway. Existing land uses in the surrounding valley include rural residential, intensive agriculture, dairy farming, extractive, field and orchard crops, public lands, public utilities easements, and open space. Portions of the site south of the San Diego River are currently engaged in agricultural activities. Crops typically grown in the area include bamboo shoots, chives, and snow peas. Existing conditions north of the river consist of partially graded areas and a dairy farm. The San Diego River runs through the project site in a narrow strip of land through the central portion of the property that is zoned impact sensitive by the County of San Diego. The El Capitan Reservoir is located just east of the project site, along El Monte Road. El Monte Road, which is two lanes, serves the adjacent rural residences and is the primary access for the adjacent dairy farm and the sole access point to the El Monte County Park and the El Capitan Reservoir.

For the LARA Model, the project's Zone of Influence (ZOI) is defined as the area within a quarter-mile of the project site, and any parcels that intersect the quarter-mile boundary. If the percentage of land within the ZOI that is compatible with agriculture is greater than 50 percent, the project's Surrounding Land Use rating is high. If the percentage is greater than 25 percent but less than 50 percent, the rating is moderate, and if the percentage is less than 25 percent, the rating is low. **Figure 2** displays the ZOI and land uses within the ZOI for the proposed project. The percentage of land within the project's ZOI that is compatible with agriculture is 75 percent. The project's Surrounding Land Use rating is high.

Land Use Consistency

Land use consistency is used to measure the effect that surrounding urbanization has on the viability of ongoing agricultural uses. A site surrounded by larger parcels indicates that the site is located in an area that has not already been significantly urbanized and the area is more likely to continue to support viable agricultural uses. On the other hand, a site surrounded by smaller parcels indicates a lower likelihood of ongoing commercial agriculture viability. **Figure 2** displays the ZOI with parcel boundaries for the proposed project. The median project's parcel size of 60.75 acres is larger than the median parcel size within the project's ZOI (0.49 acres) by more than 10 acres, which means the project's Land Use Consistency rating is low.

Slope

Slope is included as a complementary factor in the LARA model to account for the important role that slope plays in the viability of a piece of land for agricultural production, as a flat site allows for a greater range of potential agricultural uses and facilitates mechanization of operations. A slope of less than 15 percent would have a high topography rating, a slope between 15 and 25 percent a moderate rating, and a slope over 25 percent would have a low rating. County-provide GIS maps and soil data were used to determine the slope rating. Using the maps, the soil types of land available for agricultural use within the project boundary and each of those soil types' slopes were determined. This information is then averaged and used to determine the slope rating for the project site. The average slope of the proposed project is 15.7 percent, and thus, the topography rating is moderate.

Direct vs Indirect Impacts

The LARA Model is a way to quantify and measure the direct impacts the proposed project would have on agricultural resources. As indicated above, the proposed project is not an important agricultural resource according to the County Guidelines. However, indirect impacts to agricultural resources could result from the proposed project. The project has potentially significant impacts from the site preparation, construction, excavation and reclamation activities related to noise and air quality that were also considered for potential effects on the Van Ommering Dairy Farm, which is located just north of the project site near the intersection of Willow Road and Dairy Road. However, the proposed project would implement noise mitigation measures and air quality mitigation measures and design considerations that result in less than significant impacts. The sound threshold expected to cause a behavioral response by animals (including dairy cows), is 85 to 90 dB, but the actual noise limit for cattle is unknown (CHSRA 2012). The Van Ommering Dairy Farm holds their dairy cows in a barn located approximately 820 feet from the proposed project's plant operations, the project's highest noise activity. At this distance, plant operations would be approximately 58 dBA, and therefore would not impact dairy cows. In addition, as the mining activities are phased from east to west, mining equipment and truck traffic would be moved away from agricultural lands and the dairy farm, creating a spatial barrier. Additionally, reclamation and revegetated lands would create buffers between subsequent mining phases and offsite land uses, including adjacent agricultural operations. Areas would be stabilized with vegetation after approximately 2 years, habitats would be established and no longer in need of irrigation within 3 years, with plants are expected to reach maturity after 3 to 5 years. All truck traffic associated with the proposed project would exit the site on El Monte Road, west of the surrounding agricultural land uses. The proposed project would not result in groundwater impacts to the adjacent agricultural users due to increased groundwater demand, as the onsite wells would be abandoned and groundwater would not be used for the project operations and reclamation and revegetation activities. Water would be supplied by Helix Water District to be used to minimize dust created from truck traffic and construction equipment on the project site. Compliance with local storm water regulations and permits would reduce any potential water quality impacts. As a result, truck traffic, dust, and water usage would not have a significant impact to the surrounding agricultural production, and would not significantly interfere with the surrounding on-going agricultural practices. Therefore, the proposed project would not adversely impact the viability of the surrounding agricultural uses.

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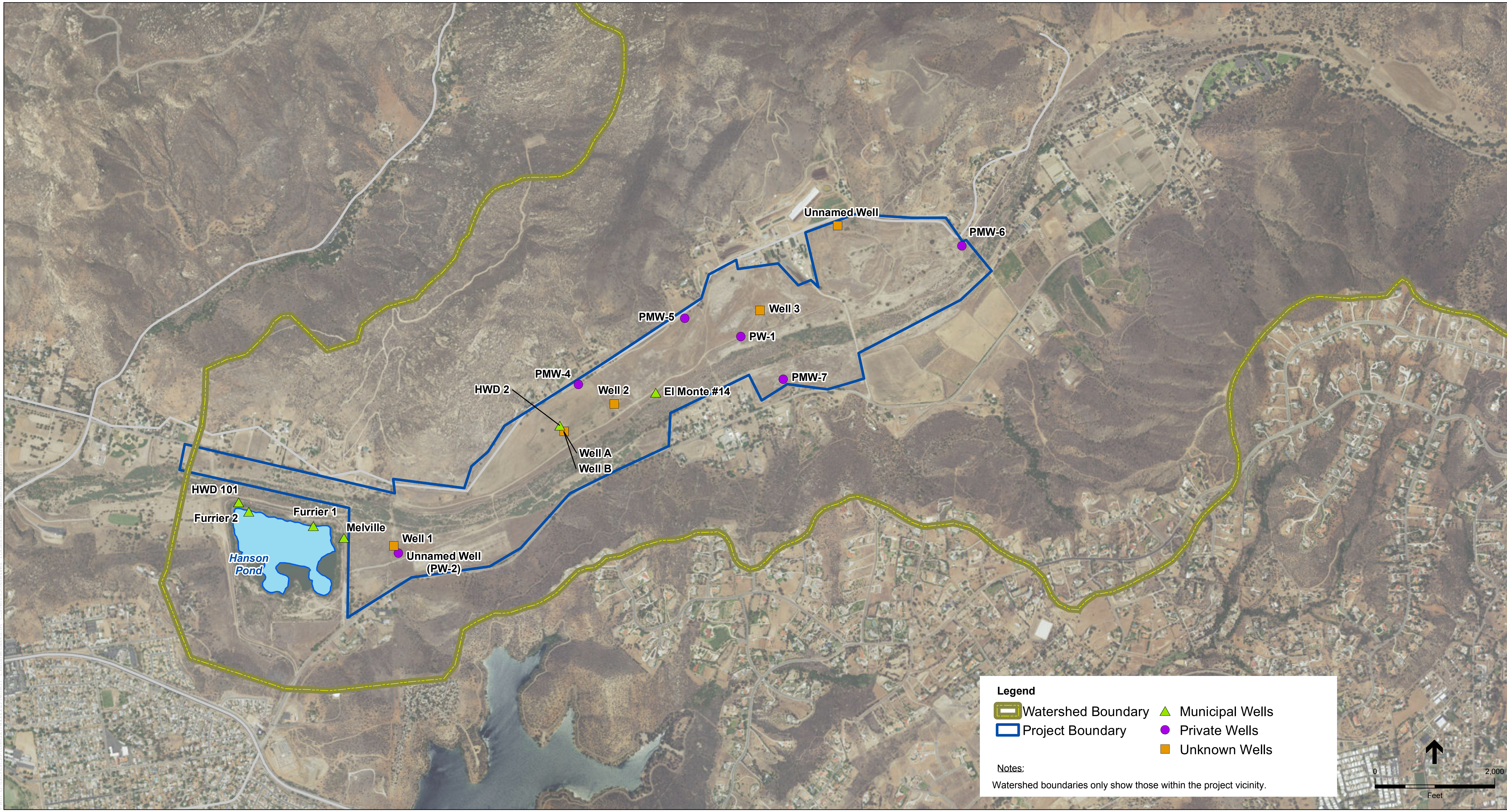
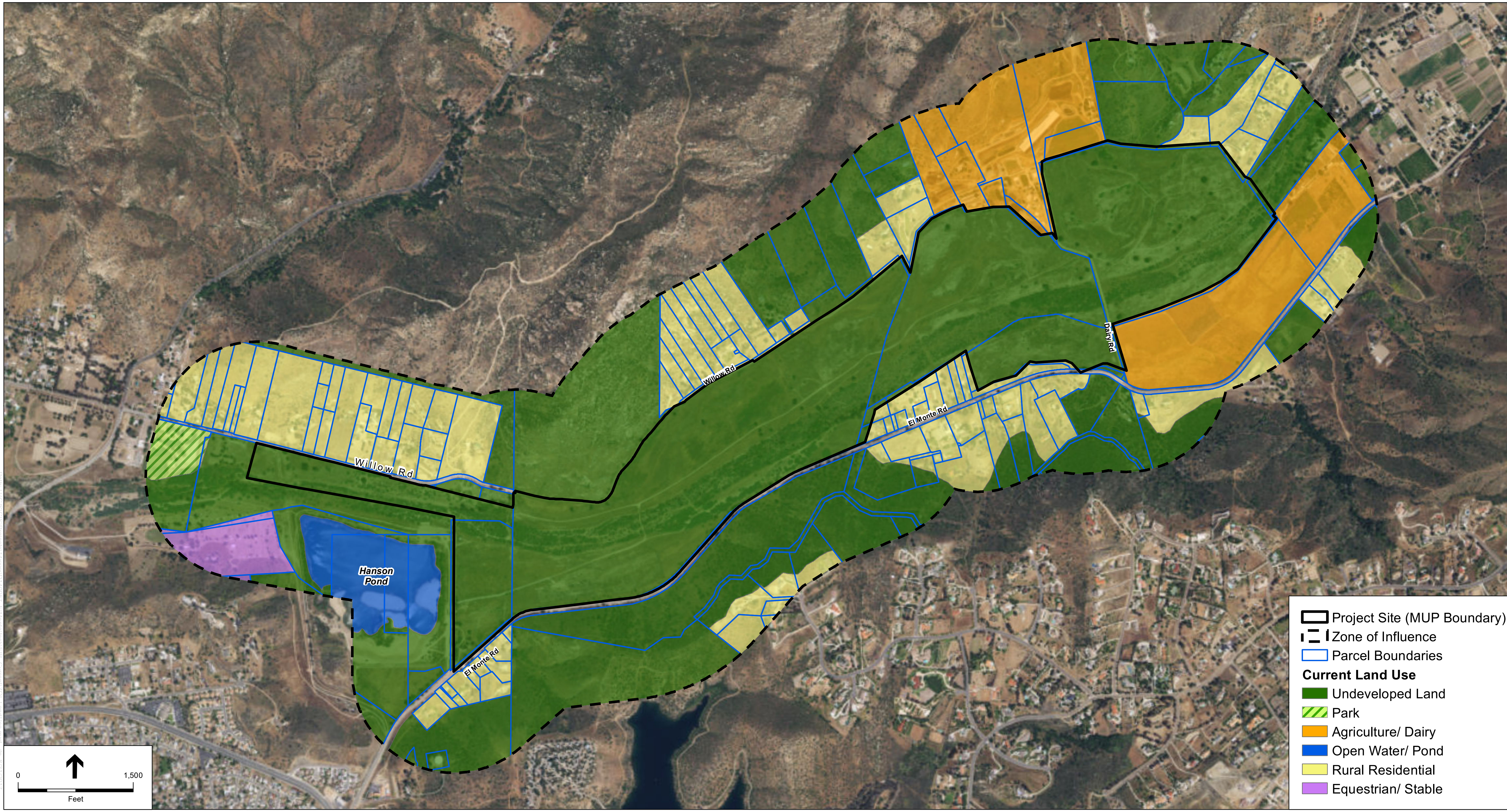


SOURCE: ESRI; AECOM, 2016

El Monte Sand Mining Project . 140957

Figure 1

Onsite Well Locations



SOURCE: NAIP 2014; SanGIS 2015

El Monte Sand Mining Project. 140957

Figure 2

Existing Onsite and Surrounding Land Use