APPENDIX H

WATER SUPPLY STUDY

WATER SUPPLY EVALUATION:

PROPOSED PAUMA CASINO AND HOTEL,

PAUMA INDIAN RESERVATION

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(following text)

I. Purpose and Scope

The purpose of this report is to summarize existing hydrologic conditions and water supply options available to the Pauma Band of Luiseno Indians (Pauma Band) specific to the proposed Pauma Casino and Hotel (hereafter referred to as 'casino' or 'project'). The report has been prepared as a supporting document for the environmental assessment of the proposed project. This report also addresses the potential for off-Reservation impacts due to the change in water use associated with the proposed project.

Please note that the numbers used in this report are presented with a limited number of significant digits and are 'rounded'. For example a value of 101.15 will typically be written as 101.

II. Site Setting

The Pauma Indian Reservation is located in north-central San Diego County within the San Luis Rey River valley, adjacent to the southern side of Palomar Mountain. It consists of four separate parcels, all located to the north of the San Luis Rey River as shown in Figure 1. The four parcels include:

An uninhabited parcel (approximately 5,600 acres) named the Mission Reserve. This parcel has an elevation range of 2,700 to 5,100 feet above mean sea level (MSL) and is located on the southwestern flank of Palomar Mountain. For reference, the highest elevation on Palomar Mountain is 6,126 feet MSL.

A 230-acre parcel where most of the tribal housing is located and where tribal activities occur (the Main Reservation). It is located at an elevation of approximately 880 to 1,200 feet MSL within the San Luis Rey River Valley. The existing temporary casino ("Casino Pauma") is located on the southwestern side of the Main Reservation. Built in 2001, Casino Pauma is approximately 92,000 square feet contained in a series of temporary Sprung tent-like structure.

Two parcels known as the Yuima tracts, each of which is approximately 12.5 acres. Both are located to the east of the Main Reservation. The focus of this report is on the Mission Reserve and the Main Reservation, therefore, these parcels are not further detailed in this report.

Pauma Creek flows from the southeastern portion of the Mission Reserve into the San Luis Rey River Valley. It crosses the eastern corner of the Main Reservation and serves as a direct hydrologic connection between the Pauma Band's Mission Reserve and their Main Reservation.

Substantial mountain front recharge of water from the Mission Reserve is expected to occur that replenishes the aquifer systems of the San Luis Rey River Valley. The

Mission Reserve has an average annual rainfall of 18 to 35 inches per year as indicated by the County of San Diego Department of Planning and Land Use's precipitation map (Figure 2). This area of relatively high precipitation encompasses the upper reaches of Pauma Creek on Palomar Mountain.

III. Site Hydrogeology

Water flows from the Pauma Band's Mission Reserve both as surface water runoff and as groundwater. These flows are directed downhill towards and ultimately into the San Luis Rey River Valley. The Mission Reserve, similar to most of Palomar Mountain, is underlain by crystalline bedrock. Alluvial stream channels on the mountain are generally limited in extent and overly rock of varied degrees of weathering and fracturing. Pauma Creek discharges from the crystalline rock terrain of Palomar Mountain into an alluvial fan complex at the mouth of Pauma Creek. The sediments within the San Luis Rey River valley are characterized by alluvial fanglomerates with particle sizes ranging from silt to sand to gravel to cobbles.

Pauma Creek is a perennial stream within the Mission Reserve. Under dry periods it has been observed to be a gaining stream and maintain base flow conditions along this reach as a result of groundwater discharge from the Mission Reserve and surrounding terrain. Observed surface water flows in Pauma Creek have consistently shown that Pauma Creek readily recharges into the river valley sediments and bedrock. Flows are rarely observed to occur at the Highway 76 Bridge (Figure 1), and streamflows are less than one cubic foot per second (cfs) or so during much of the year. These observations indicate that percolation is rapid and efficient; therefore, water balance calculations presented in this report assume that 100% of the surface water that discharges from Pauma Creek canyon is recharged into the valley.

In October 2007 much of the Mission Reserve and the Pauma Creek watershed were affected by wildfire. The fires were extensive and have resulted in a short-term change in runoff. Stormwater flows have temporarily increased, as has the potential for mud and debris flow. Flows in Pauma Creek following storms have appeared to increase relative to rainfalls prior to the fires. It is expected that this condition will continue until vegetation is re-established within the burned areas of the watershed.

Geologic studies on the Pauma Reservation have been used to characterize the aquifers in the area. Methods for evaluation included pilot seismic mapping, a regional gravity and magnetic study, and data collected from multiple well bores.

The Pauma Creek aquifer system appears to have a high potential for groundwater development. This aquifer system is believed to contain an extensive fracture network which is hydraulically connected to Pauma Creek. The aquifer also is likely associated with basement faulting and fracturing which have the capability of storing and transmitting appreciable quantities of water. The transmissivity of the aquifer varies depending on fracturing, and ranges from 500 to 2,000 gallons per day per foot. The groundwater flow direction is from north-northeast to south-southwest and likely has

similar gradients to the topography. This aquifer is recharged from rainfall and Pauma Creek baseflows. The transmissivity of the aquifer has been considered in assessing the potential effects of groundwater recharge off the reservation (see Section VII).

The alluvial fan aquifer system is characterized as a series of two or three alluvial fans, each of which is 200 to 400 feet thick and an overall thickness of over 400 feet in the project area. These fans are poorly sorted, non-uniform and may be hydraulically separated by various discontinuous confining and semi-confining layers. The capacity of the deeper bedrock aquifer system is dependent on the fracture system and may have highly localized storage and transmissivity. Typical well production rates range from 10 to 50 gpm. However, some wells have been highly productive (likely due to the extensively fractured bedrock that occurs along the base of the mountain associated with the regional Elsinore Fault Zone) and have had capacities of 50 to 100 gallons per minute of sustainable flow.

An unknown quantity of precipitation on the Mission Reserve recharges the groundwater beneath the reserve via deep infiltration along fault and fracture systems. The location and extent of these systems and their ability to transmit water is difficult to characterize. No additional analysis is provided in this Report since the groundwater resources of the Mission Reserve are not relied upon for the proposed project.

IV. Water Supply: Current and Future Sources for the Pauma Indian Reservation

The Pauma Indian Reservation has access to multiple, currently-developed sources of water as well as potential future supply from off-Reservation sources (see Figure 3).

Surface Water

Pauma Creek: The watershed of Pauma Creek essentially extends to the top of Palomar Mountain and the stream channel occurs along the southern side of the Mission Reserve and the Pauma Reservation. The Pauma Band has the highest priority water right for surface water from Pauma Creek and is legally entitled to divert 270 gallons per minute (gpm) from the creek (equivalent to 30 miner's inches or 435.5 acre-feet per year, assuming sustained flow). The water is currently being used by the Tribe to support agriculture (primarily citrus and avocado), and for non-potable residential purposes. Water that is not diverted continues to flow down Pauma Creek and discharges into the San Luis Rey River valley. As previously noted, the surface water readily percolates within the creek channel and recharges the groundwater system within the San Luis Rey River Valley.

Pauma Creek's generally has good water quality since the Pauma Creek Watershed is not developed and rainfall rates are high. The water is not treated by the Pauma Band and is directly used for commercial irrigation and other non-potable uses on the Main Reservation. The Pauma Valley Water Company also has a lower priority right to divert

Pauma Creek water. Currently the water they divert is understood to be used for non-potable purposes.

San Luis Rey Indian Water Authority: The Pauma Band is one of five tribes that belong to the San Luis Rey Indian Water Authority. "The Authority unifies [the Tribes] to protect, develop and manage the resources provided under the San Luis Rey Indian Water Settlement." (www.slriwa.org) This settlement redressed the historical diversion of water from the San Luis Rey River into the Escondido Canal for the non-Indian communities of Escondido and Vista by entitling the member tribes to a total of 16,000 acre-feet of water per year. The complex agreements and water systems required in this settlement have delayed delivery of the water. A pipeline has been proposed to deliver water to some member tribes. While a valuable future resource to the Tribe and significantly greater than the Project demand, this water is not considered in this report as a source for the proposed casino.

Groundwater - Wells[1]

Water supply wells located on the Main Reservation will be used to supply water for the proposed casino. Wells have been completed within the alluvial sediments that occur along the flank of Palomar Mountain and in the underlying granitic rock. The wells have the following range of characteristics:

- Depth: 250 to 750 feet below ground surface
- Capacity: 60 to 125 gallons per minute
- Apparent aquifer transmissivity from pumping tests: 500 to 2,000 gpd/ft

The quality of water from the wells is generally good; all have water quality that meets Safe Drinking Water Act primary and secondary standards. The domestic wells are currently chlorinated and fluoridated. The typical water quality for key parameters is known from testing to be as follows:

- Total Dissolved Solids (TDS): 275 to 375 mg/L
- Sulfates: 20 to 60 mg/L
- Alkalinity: 60 to 120 mg/L
- Hardness: 145 to 170 mg/L
- Nitrates: 0.3 to 3.0 mg/L
- pH: 6.7 to 8.5

Recycled Water – Treated Wastewater

Onsite recycled water will be obtained from a new wastewater treatment plant for the proposed casino. Wastewater from the proposed project's facilities will be tertiary treated to California "Title 22" standards at an on-site wastewater treatment plant

[1] Specific well data are confidential and not included in this report. The wells that will serve the proposed project have been tested and meet all applicable water quality standards for the project.

(California Code of Regulations (CCR) Title 22, Division 4, Chapter 3). These standards were developed by the California Department of Health Services (DHS) for recycled water. Allowable uses include irrigation, fire fighting, residential landscape watering, industrial uses, food crop production, construction activities, commercial laundries, road cleaning, recreational purposes and decorative water features.

The recycled water is proposed to be used for commercial and landscape irrigation within the proposed project area. A significant portion of the recycled water will ultimately be returned to the groundwater system via existing subsurface leach field drainlines and three future percolation ponds.

Currently Casino Pauma does not recycle water from their existing wastewater treatment plant. The treated wastewater is discharged to subsurface leach field lines and represents ongoing groundwater recharge.

V. Water Demand Calculations

Irrigation

Currently, the Pauma Band has 41.7 acres of commercial groves that will be removed for construction of the proposed casino and upon project completion, 9.36 acres will be replanted, resulting in a net loss of 32.33 acres. The 9.36 acres of replanted groves will be irrigated using recycled water from the project. The Pauma irrigation system uses small sprinkler heads and is assumed to be 85% efficient. The remaining irrigation water is either not delivered (evaporative system losses assumed to be 5%), or is excess irrigation (10%). The excess irrigation is intentional and allows for flushing of the root zone. The water passes through and below the plant root zone and becomes groundwater recharge.

The amount of water required for irrigation varies over the year. The irrigation rate has been calculated based on information from The California Irrigation Management Information System (CIMIS). CIMIS is a program in the Office of Water Use Efficiency (OWUE), California Department of Water Resources (DWR) that manages a network of over 120 automated weather stations in the state of California (www.cimis.water.ca.gov). The Reservation is in CIMIS Zone 9 and has a base evapotranspiration rate of 55.1 inches per year. The base rate is adjusted for the type of crop being irrigated. A CIMIS crop factor of 0.75 is applied here for citrus and avocado, resulting in an annual water use rate of 3.5 feet / year.

Proposed Pauma Casino and Hotel ("Project")

Currently, the existing Casino Pauma uses 60 acre-feet of water per year, supplied from the Pauma Band's groundwater supply wells. The Proposed Casino is estimated to require 294 acre-feet of water per year (Table 1) as determined from the following water demand calculations, which are based on wastewater system design standards.

As currently planned the new casino would include:

- Approximately 2,900 gaming positions (including slot machines, table games and poker tables)
- A 400-room hotel (including 16 'villas') with 2 pillows per room
- Restaurants (including specialty restaurants, buffet dining and a coffee shop) with a combined total of 1,220 seats
- Bar and cocktail facilities (including a center bar, cabaret lounge and table games bar) with a combined total of 320 seats.
- Resort facilities (16,842 square feet) including a pool and spa to accommodate 600 guests per day.
- Multi-purpose entertainment events facility (19,383 square feet) with 1,500 seats and meeting facilities (34,902 square feet) with a another approximately 500 seats
- Employees (2,200 total)

In comparison, the existing Casino Pauma consists of:

- 1 restaurant with approximately 150 seats.
- 1 small snack bar with about a dozen seats.
- 2 beverage bars with approximately 75 seats.
- 37,100 square feet of casino gaming floor space with approximately 1,090 gaming machines and 22 table games.

Upon completion of the new casino, the existing Casino Pauma will be closed. The water supply currently provided to Casino Pauma will be utilized in the new casino.

Water demands for the new casino were estimated by utilizing the above development plan provided and the following unit demand numbers, which are based on wastewater systems design standards and professional experience:

- 15 gpd per gaming position
- 75 gpd per pillow per hotel room.
- 75 gpd per restaurant seat.
- 5 gpd per walk-in guest for entertainment and conference facility.
- 30 gpd per bar and lounge seat.
- 10 gpd for each pool and spa guest.
- 15 gpd for each employee

Water demands for the new casino are shown in Table 3. This demand calculation assumes:

- 100% casino and hotel occupancy.
- 50% of the entertainment and meeting visitors are not casino or hotel guests.

- All outdoor casino landscape irrigation will be from recycled wastewater. This is estimated to be 32 acre-feet/year.

An additional 16 acre-feet/year of treated water will be required to operate the air cooling system ("chillers") for the proposed casino.

The projected water demands for the new casino and associated development are 96 million gallons (294 acre-feet) per year and will average approximately 262,900 gpd at 100% occupancy. Using a peaking factor of 1.25, daily demands during the peak month for the proposed casino development are approximately 325,000 gpd.

VI. Water Balance: Existing and Proposed Project

The water balance is a comprehensive tracking of demands, depletions and recharge of water. The amount of water delivered is the demand. Depletions are a measurement of how much water is permanently removed from availability (consumed) after its use. Recharge is the amount of water that is returned through infiltration to the groundwater system. The water balance for the existing and proposed Pauma Casino and grove irrigation is shown in Figures 4 and 5. A comparison of the two water balances is used to determine the potential impacts from the proposed project.

Demands

Demands for the existing and proposed casino are met by groundwater wells. In addition, the proposed casino will use recycled water for replanted grove and landscape irrigation demands. Details on demand calculations are discussed in the previous section.

Pauma Casino and Hotel

The existing Casino Pauma and its landscape currently use 60 acre-feet/year of groundwater. The proposed casino would require approximately 294 acre-feet/year of treated groundwater, as explained in the previous section. The proposed project's landscaping will require 32 acre-feet/year, which will be supplied by recycled wastewater.

Grove Irrigation

Currently 41.7 acres of groves within the proposed project area are irrigated with surface water. The proposed casino will reduce groves within the project area to 9.36 acres which will be irrigated using 39 acre-feet/year of recycled water from the proposed casino.

Depletions (Consumptive Losses)

Grove Irrigation

The future irrigation of replanted groves will consume approximately 35 acre-feet/year of recycled water.

On-site Landscape Irrigation
Current landscape irrigation at Casino Pauma is supplied from potable wells. These depletions are estimated to be 21 acre-feet/year. The proposed casino landscaping will be irrigated with recycled water, with estimated depletions of approximately 29 acre-feet/year.

Percolation Ponds
The project design also includes the construction of three percolation ponds, with a total surface area of approximately 1.5 acres. These ponds provide additional infiltration capacity for the recycled water during peak use periods. Any unused recycled water from the casino that is not used for landscape or grove irrigation or sent to the leach field will be put into the ponds in order to infiltrate into the water table. Future depletions from pond evaporation (at a rate of 5 feet per acre per year) will equal approximately 8acre-feet/year.

Cooling Towers
Cooling towers ('chillers') to control the temperature inside the proposed casino will consume 16 acre-feet of water per year. Due to the requirements of the cooling system, it is not possible to use recycled water for this purpose.

Water Delivery System and Waste Solids and System Losses
The wastewater treatment system recovers the vast majority of water processed. Water losses occur from waste solids that are removed from the waste stream and disposed of off-site. Inefficiencies and losses occur within the delivery system, however, these losses occur in the subsurface supply piping and are expected to be recharged and cause no net loss. In total, the wastewater treatment facility is approximately 10% depletive of the water delivered to the project. Current waste solids and system loss depletions are 4 acre-feet/year and will increase to 28 acre-feet/year with the proposed casino.

Recharge

Groundwater Recharge is the difference between the demands (water delivered) and the consumption (water used that does not return to the system). Methods of recharge include return flows from grove and landscape irrigation (i.e. water in excess of the evapotranspiration demands that seeps into the ground) and artificial recharge from recycled water that is placed in percolation ponds and leach fields.

It is important to note that the proposed project will use recycled water to irrigate replanted groves and landscape, as opposed to the existing casino which uses groundwater to irrigate landscaping. Water in excess of the irrigation demands will be discharged, and will directly contribute to groundwater recharge through on-site by percolation ponds and subsurface leach lines which are designed to allow water to gradually infiltrate as groundwater recharge. The amount of recycled water produced by the project will vary over the year, as will the irrigation demand. The design of the percolation ponds and leach lines takes this variation into account. These facilities are designed with adequate capacity for recycled water even during peak use season.

Currently, wastewater and excess landscape irrigation from the existing casino generates approximately 35 acre-feet/year of groundwater recharge. The proposed casino and hotel will generate 179 acre-feet/year of groundwater recharge after meeting in-door demands as well as landscaping and replanted grove irrigation demands.

Although the project calls for an increase in the groundwater demands, a significant proportion of the water (60%) will be returned through recharge.

Water Balance Conclusions

The proposed project, as compared to the existing casino, will create a net increase of groundwater pumpage of 234 acre-feet/year and an increase of groundwater recharge of 144 acre-feet/year. Therefore, the net groundwater withdrawals for the proposed project is 90 acre-feet/year (= 234 - 144). This is roughly equivalent to adding 24 acres of irrigated citrus groves. depletion

VII. Potential Impacts to Off-Reservation Water Resources

Groundwater Pumping – Well Interference Effects

Water levels in wells in the vicinity will be affected by the increased groundwater pumping for the project and by the increased recharge of recycled water associated with the project. Therefore, an analysis has been conducted to calculate the change in groundwater levels associated with the project. A map of the study area showing known permitted water wells with parcel data was provided by the County of San Diego Department of Planning and Land Use (DPLU) (Figure 6). It is important to note that the well locations are centered on the parcel and do not represent actual well locations. The impacts from pumping and recharge on the Reservation will diminish with distance; therefore the well nearest to the Reservation has been used for analysis of a worst case scenario. The nearest well ('subject well') is located on a parcel on the corner of Highway 76 and Hampton Road, as shown on Figure 6. It should be noted that Figure 6 shows a well on the parcel directly south of the Reservation, however, a follow-up investigation was unable to verify the existence of a well in this area.

Currently, Pauma's producing wells tap the aquifer that is recharged along the mountain front and from Pauma Creek surface flows. Additional wells in nearby locations on the Reservation are proposed to be constructed to meet projected future demands and to provide for contingency supply during well maintenance. For the purpose of this analysis, the pumping locations (site of current and proposed wells) have been approximated, shown as P1 and P2 on Figure 6.

The conditions of the analysis included an assumption that water in Pauma Creek and adjacent sediments represent a hydraulic boundary condition that offsets water levels impacts, especially for any wells located nearby the Creek. Similarly, water in the San

Luis Rey and adjacent sediments represent a hydraulic boundary condition that offsets water levels impacts.

The parameters used for the analysis are based on the changes in the water balance of the existing casino and the proposed project. The existing casino groundwater demands are 60 acre-feet/year, which is pumped in the area P1. The projected future demands will be 294 acre-feet/year, an increase of 234 acre-feet/year. The water will be produced from wells on the Reservation; approximately 80% from area P1, and additional supply potentially from well(s) in area P2. R1 represents the net change in recharge in the area of the project, which is 144 acre-feet/year (this is equal to the increased recharge of 179 acre-feet/year minus the existing recharge of 35 acre-feet/year). This accounts for changes in wastewater infiltration as well as replanted grove and landscape irrigation within the project area.

Areas P1, P2, and R1 each have the potential to affect groundwater levels and are located at approximate distances of 7100, 4900 and 4500 feet, respectively, from the subject well as shown in Figure 6. Per DPLU comments received for the TEIR, an analysis has been conducted to estimate the change in water levels that could potentially occur at the subject well after five years of project water use. Given the complexities of the site hydrologic system, the calculation has been conducted by representing the three areas as individual wells, with the production areas as discharge wells and recharge area being represented as a recharge well. The calculation was conducted using the Theis equation for time-dependent flow to a well. Utilizing the principle of superposition, the effects of each of the three areas on the subject well were then summed to calculate the cumulative effect of pumping and recharge on water levels.

The calculation was conducted using a numerical approximation to the Theis equation and requires the input of values for the aquifer transmissivity and storativity. Transmissivity (T), a measure of the ability of the aquifer to transmit water, was based on pumping tests and is assumed to range from 67 to 267 ft^2/day, with a mean of 167 ft^2/day (as shown in Table 2). Storativity (S) is a measure of the amount of water released from the aquifer for a unit change in pressure head. It is conservatively assumed for this analysis that the storativity for the unconfined alluvial aquifer system is 0.01 ft/ft. The changes in water levels (drawdown) were then calculated for the subject well over 5 and 10 yeaers, assuming that it has a saturated column of water of 500 feet.

Table 3. Interference Analysis for Subject Well based on the Proposed Project

Time (years)	Transmissivity (ft^2/day)	Storativity (ft/ft)	Drawdown (ft)	Drawdown as Percent of Total Water Column*
10	167	0.01	1.75	0.4%

*Assumes a water column height of 500 feet

The impacts from the proposed project to a well with a depth of 500 feet after five years will be negligible. After ten years, which is twice the County guideline's recommended

study period, there will be a drawdown of 0.4% (see Table 3, above). This is within the guidelines for significant impacts (5%) as defined by San Diego County.

Importantly, the effects of off-Reservation groundwater uses to water levels in the Reservation wells were not considered in this analysis. Commercial irrigation requires large quantities of water, most of which is 'irrigation depletion' and only a small percentage returns to groundwater.

VIII. Conclusions

The proposed casino will change the type of use and primary water supply source for commercial development on the Pauma Reservation. The project's groundwater will supply the new casino and hotel, and recycled water produced by treating project wastewater to "Title 22" standards will supply the project landscaping and approximately 9 acres of replanted groves. By using recycled water for project irrigation and increasing groundwater recharge through the infiltration of treated wastewater, the proposed casino will reduce its overall impact to groundwater. The net groundwater withdrawal for the project will be 90 acre-feet/year.

The incremental changes in groundwater pumping and recharge from the existing casino to the proposed project were used to conduct an interference analysis for area wells. The result after ten years will be an estimated water level drop of 0.4% in the 'subject well' (the nearest known permitted well to the Reservation). This drawdown is judged not to be significant and is likely within the range of natural or background water level variability expected to occur seasonally.

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Tables

Table 1. Revised Proposed Pauma Casino and Hotel Indoor Demands

Annual Total	Hotel	Restaurants	Bars and Lounge	Gaming Positions	Pool and Spa	Events and Conference Facilities	Employees	Project Total	Total + Cooling Towers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Gallons	21,900,000	33,397,500	3,504,000	15,877,500	2,190,000	1,825,000	12,045,000	**90,739,000**	**95,952,616**
Acre-Feet	67	102	11	49	7	6	37	**278**	**294**
gpm	42	64	7	30	4	3	23	**173**	**183**
gpd	60,000	91,500	9,600	43,500	6,000	5,000	33,000	**248,600**	**262,884**

Average Day of Peak Month[10]

gpd	**310,750**	**325,033**
AF/day	**0.95**	**1.00**
gpm	**216**	**226**

Notes:
gpm = gallons per minute; gpd = gallons per day; AF = acre-feet.
Assumes 100% Occupancy Year-Round
Assumes all outdoor lawn and garden irrigation or water features will be supplied with reclaimed water.

Column Notes:
1) Hotel equals 400 rooms x 2 pillows per room x 75 gallons per pillow per day x 365 days/year.
2) Restaurant equals 1,220 seats x 75 gallons per seat per day x 365 days/year.
3) Bar and Lounge equals 320 seats x 30 gallons per seat per day x 365 days/year.
4) Gaming Position equals 2,900 gaming positions x 15 gallons per day per position x 365 days/year. Includes use of restroom facilities.
5) Pool and spa equals 600 guests per day x 10 gallons per person x 365 days/year.
6) Events and Conference Facilities equals 2,000 seats x 5 gallons per seat x 365 days/year x 50% factor for excess walk-in guests
7) Employees equals 2,200 for entire facility x 15 gallons per employee per day x 365 days/year.
8) Total equals the total of Columns (1) through (7).
9) Cooling towers will add 14,283 gpd (16 af/yr) of demands, bringing the total to 294 acre-feet per year
10) Average Day of Peak Month equals average day x 1.25. (Factor would be higher if irrigation water is supplied with potable water)

Table 2. Parameters for Interference Analysis for Area Wells
Existing Casino and Proposed Pauma Casino and Hotel

(All Values in Acre - Feet per year)

	Existing	Proposed	Net Increase
Casino Demands[1]	60	294	234
Groundwater Recharge[2]	35	179	144
Increase in Groundwater Withdrawal[3]			90

Notes:

1) Existing and Proposed Casino Demands are met from pumping groundwater
2) Groundwater Recharge for the existing casino is through landscape irrigation (2 AF/yr) and from wastewater infiltration (33 AF/yr).
   Groundwater Recharge for the proposed casino includes return flows from replanted grove irrigation (4 AF/yr), return flows from landscape irrigation (3 AF/yr) and leach field/percolation pond recharge (172 AF/yr)
3) Increase in Groundwater Withdrawal = Net Increase Demands - Net Increase Recharge

For comparison, given a base irrigation water demand of 3.5 acft/acre, the increase is equivalent to approximately 24 acres of crops assuming an 85% irrigation efficiency and 10% irrigation returns.
89 AF/yr = ((3.5 acft/ac) x (24 acres) / (85% efficiency)) - (10% irrigation returns)

Figures

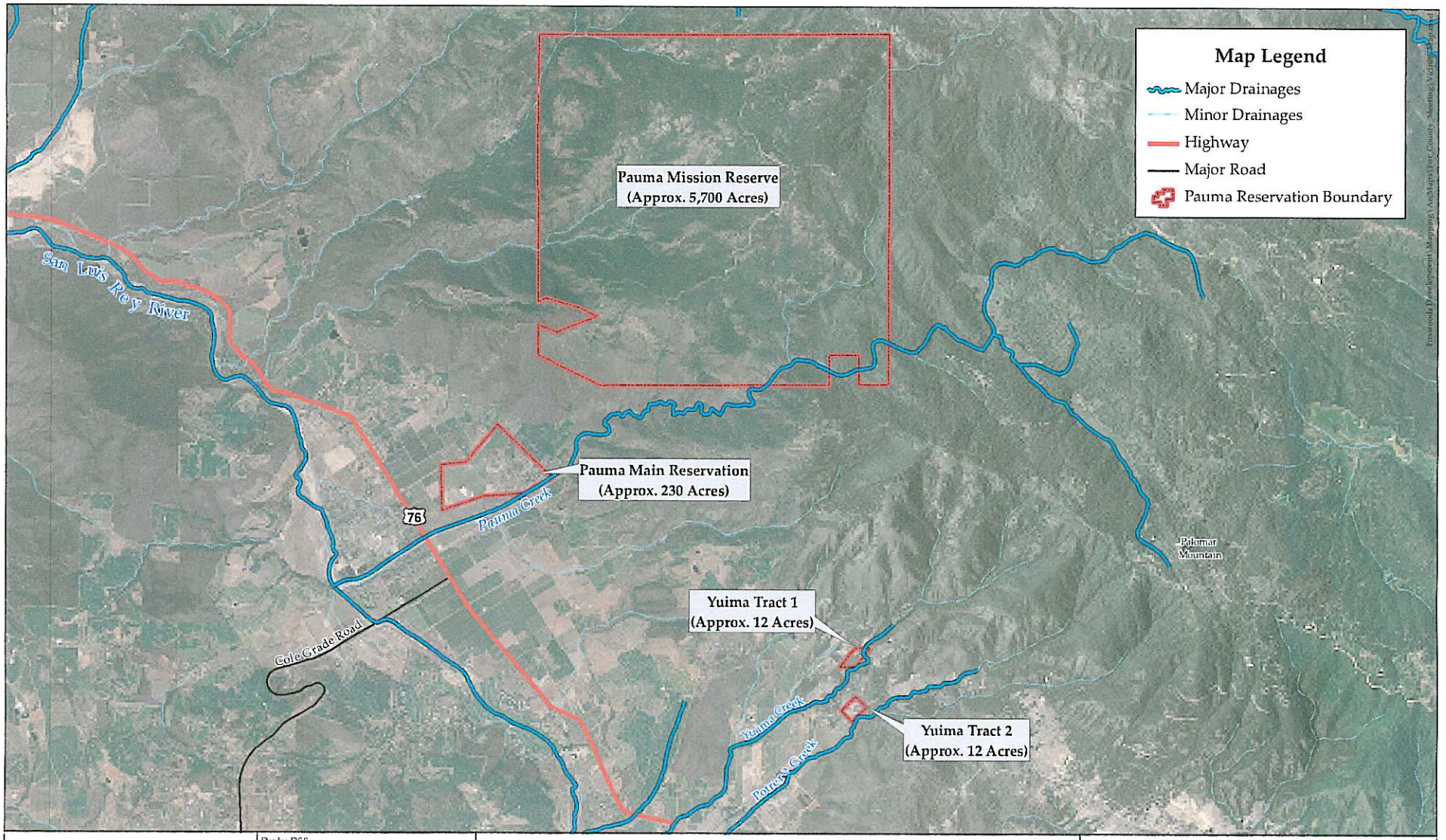

Figure 1. Pauma Reservation Vicinity Map

555 RiverGate Lane, Suite B4-82
Durango, CO 81301
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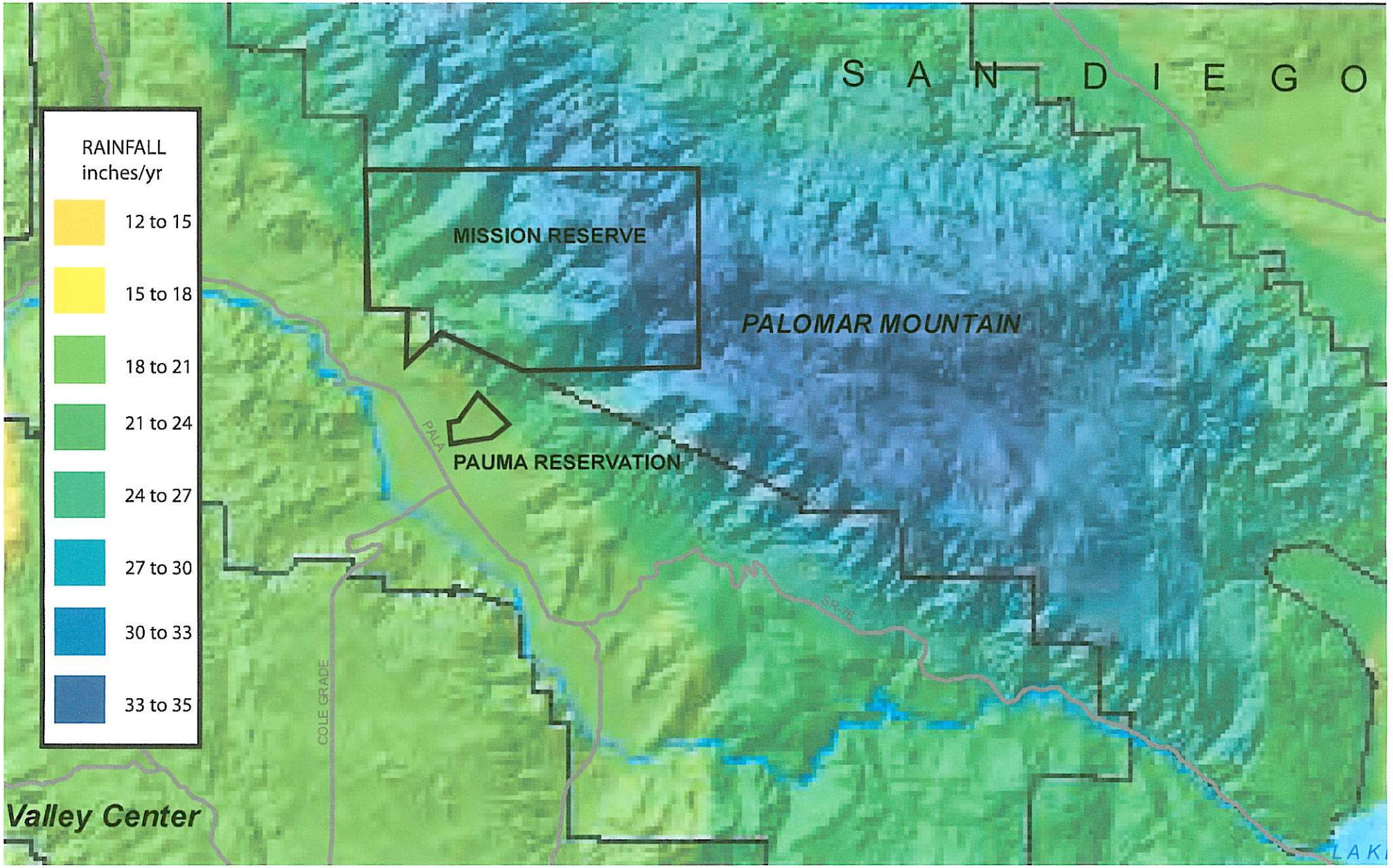

Figure 2. 30-year Average Rainfall (from DPLU, 2004)

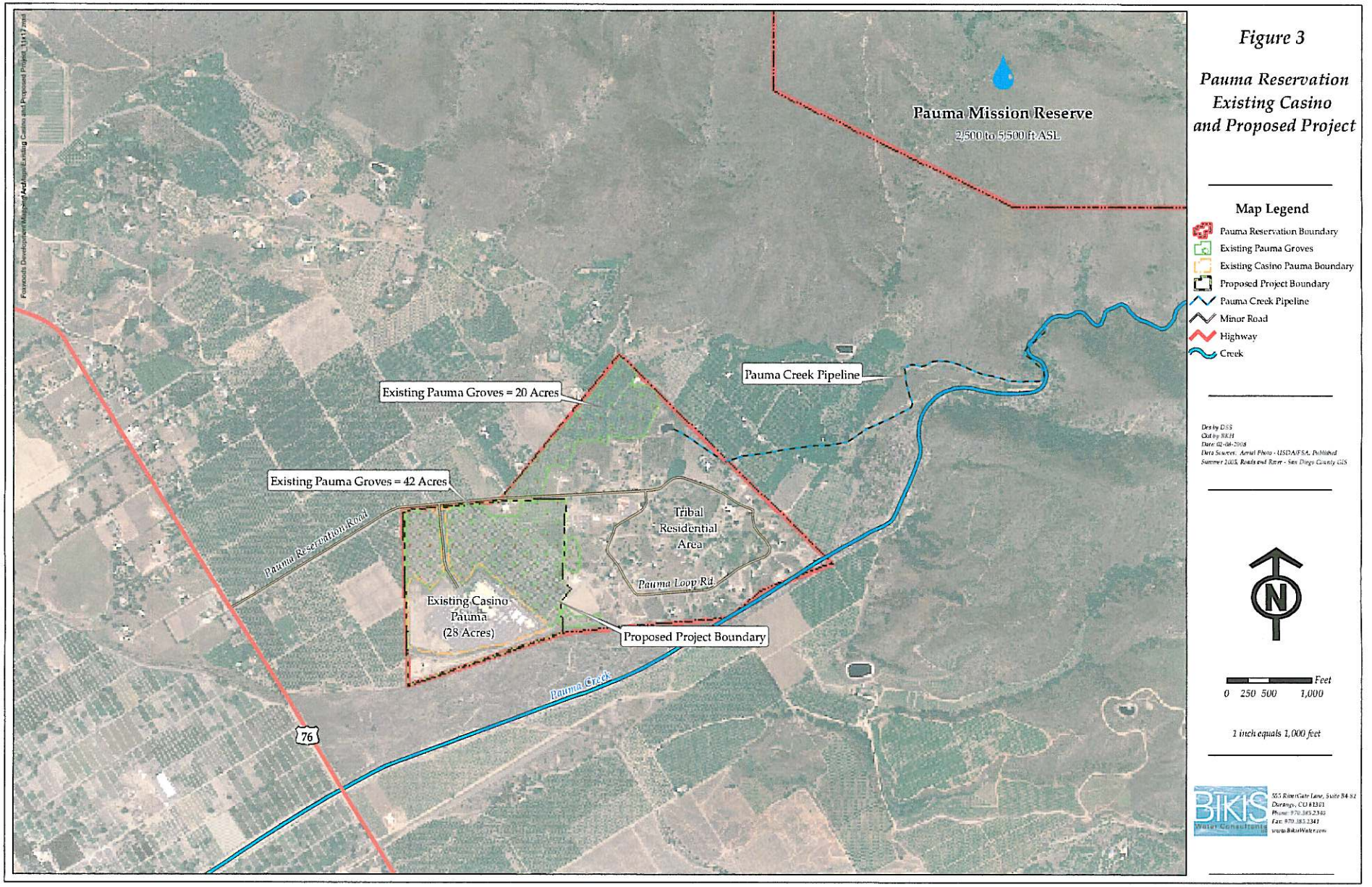

Figure 3

Pauma Reservation Existing Casino and Proposed Project

Map Legend

- Pauma Reservation Boundary
- Existing Pauma Groves
- Existing Casino Pauma Boundary
- Proposed Project Boundary
- Pauma Creek Pipeline
- Minor Road
- Highway
- Creek

Drn by DSS
Chd by MKH
Date: 02-06-2008
Data Sources: Aerial Photo - USDA/FSA, Published Summer 2005, Roads and River - San Diego County GIS

N

0 250 500 1,000 Feet

1 inch equals 1,000 feet

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Figure 4. Water Balance Schematic by Source:
Existing Casino Pauma

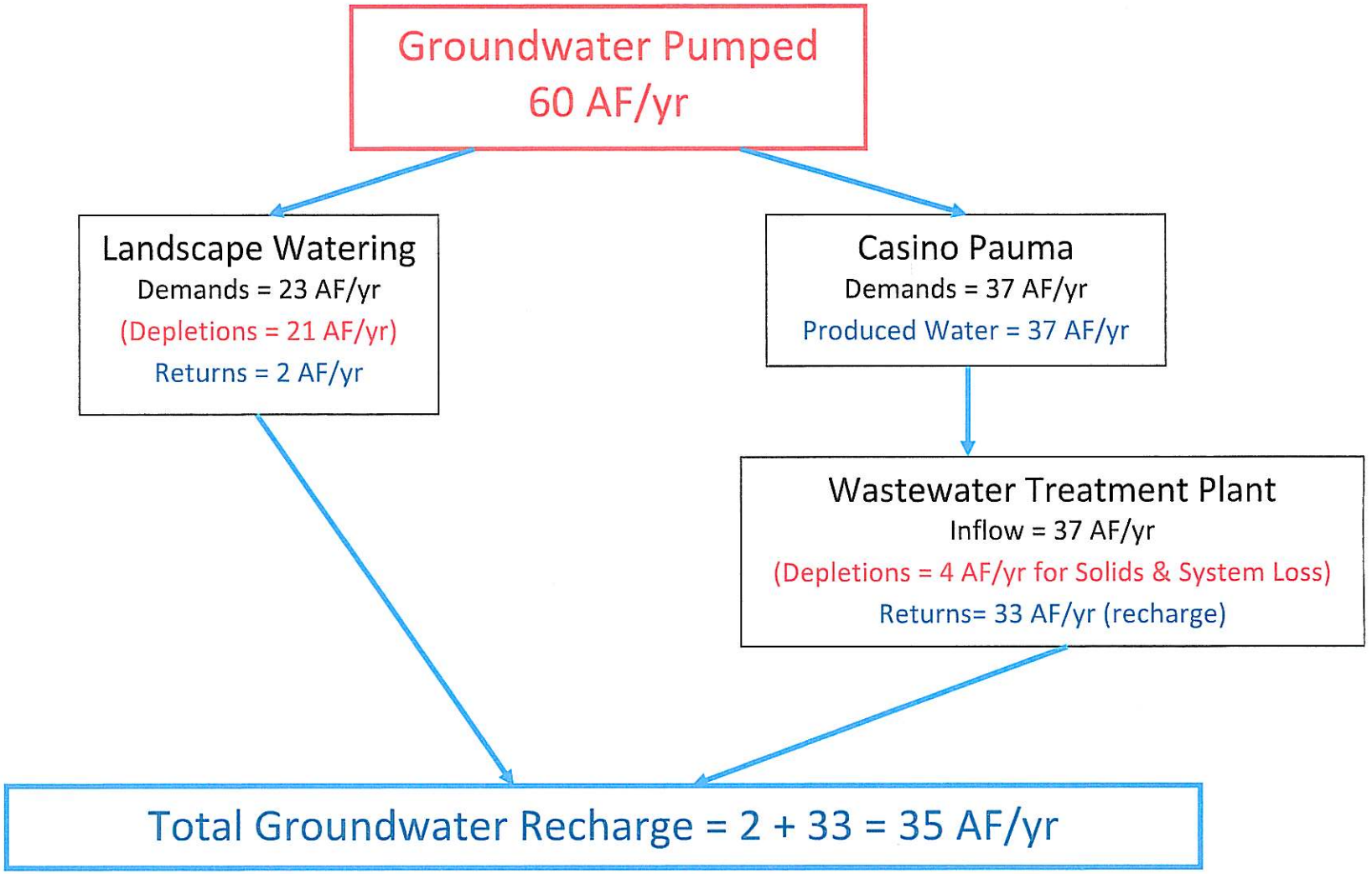
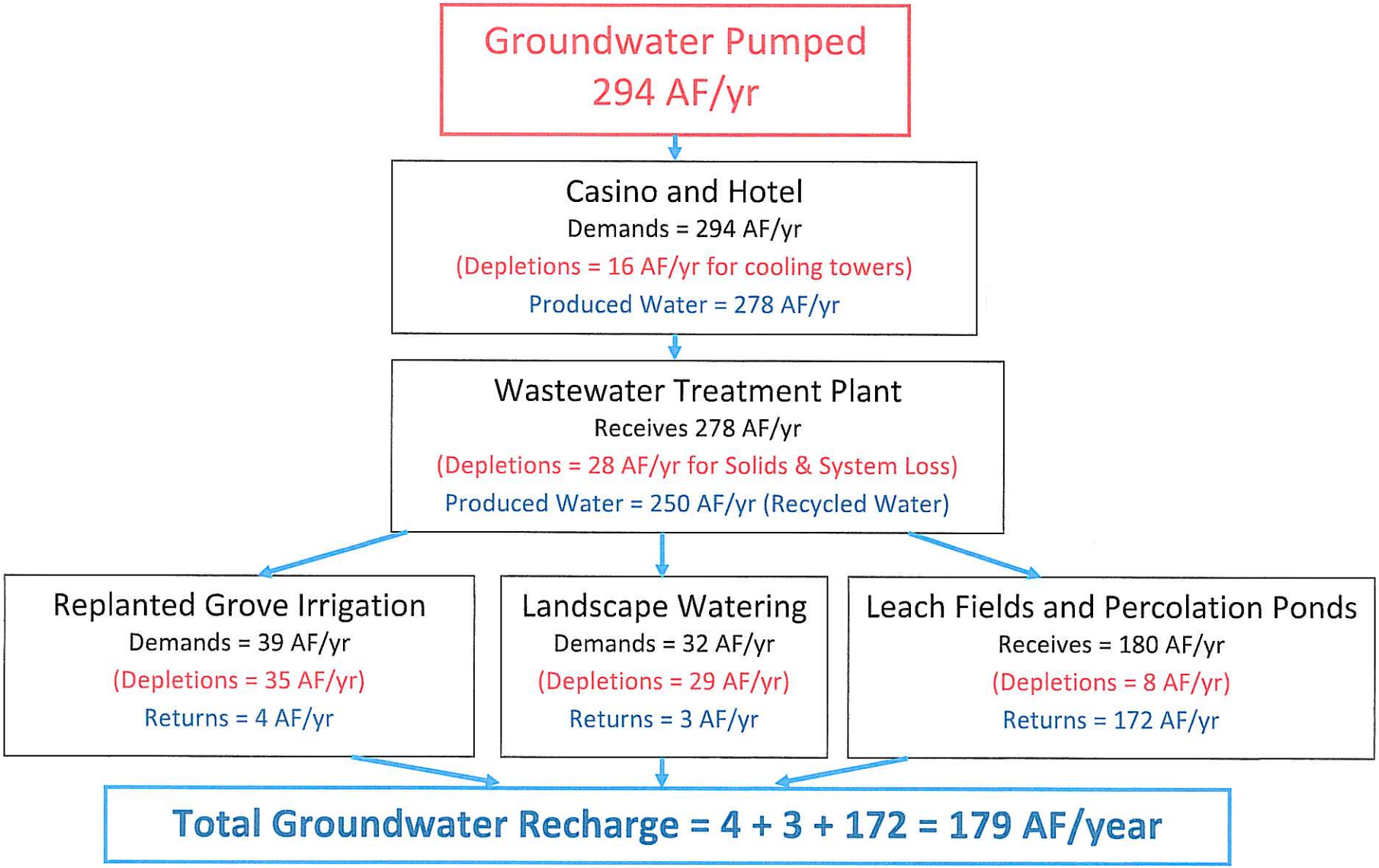
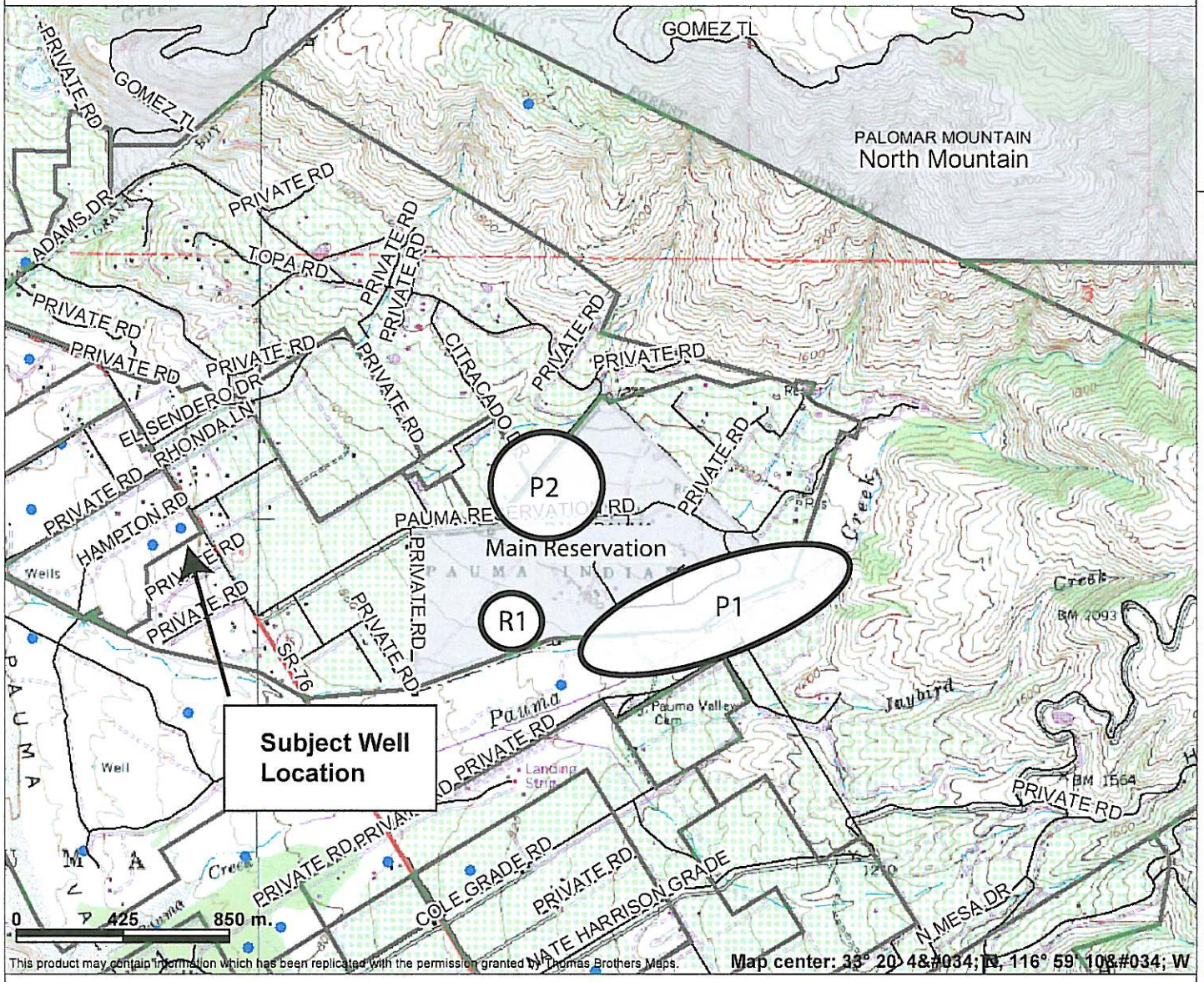
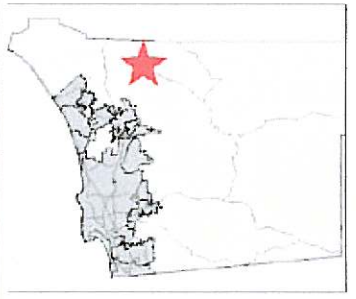


Figure 5. Water Balance Schematic by Source:
Proposed Pauma Casino and Hotel







Legend

- SANGIS.TAX_RATE_AREA
- Highways
- Freeways
- Streets
- Water Bodies
- Water Bodies
- supply wells (centered in parcels- true locations not shown)
- Indian Reservations
- Sponsor Groups
- Sponsor Groups
- Other
- Community Planning Area
- Community Planning Areas
- USGS 7.5 Min Topo Quad

Figure 6. Interference Analysis for Area Wells – Location Map

(DPLU Map Modified by ENSI-BWC)

Scale: 1:23,883

DPLU GIS