#### FINAL

### Work Plan for Source Capacity Study Live Oak Springs Water Company Live Oak Springs, San Diego County, California

Prepared for:

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#### 1. Introduction

Live Oak Springs Water Company (LOSWC; Site) is located in the unincorporated community of Live Oak Springs in southeast San Diego County (Figure 1). The Site encompasses Assessor's Parcel Numbers (APNs) 609-090-31, 609-160-20, and 609-050-06, located south of Interstate 8 (I-8). The Site is bordered on the north and west by the Campo Indian Reservation. The study area lies within the Live Oak Springs U.S. Geological Survey (USGS) 7.5-minute quadrangle, Township 17 South, Range 6 East, Sections 14 and 23 (Figure 2).

LOSWC is regulated by the California Public Utilities Commission (CPUC), which in addition to setting rates, is responsible to ensure that water provided meets all applicable state and federal water quality standards (Harwell v. Superior Ct., 27 Cal. 4<sup>th</sup>. 256 (2002)). The 1987 Memorandum of Understanding between the State Department of Health Services (DHS) and the CPUC "On Maintaining Safe and Reliable Water Supplies for Regulated Water Companies in California" (updated in 1996); defined DHS's responsibility for identifying contaminants and the improvements necessary to provide safe water supplies, and for initiating enforcement actions under the Safe Drinking Water Act (SDWA) (42 U.S.C. § 300f et seq). The County of San Diego Department of Environmental Health (DEH) has been delegated by the state of California Department of Public Health (CDPH; formerly DHS) authority to regulate community water systems serving less than 200 service connections (California Health and Safety Code (H&SC), Section 116330.

#### 1.1. Purpose of the Work Plan

This Work Plan was prepared on behalf of LOSWC by Dudek for submittal to County of San Diego DEH to satisfy scoping requirements outlined in Title 22 of the California Code of Regulations (CCR) Section 64554, New and Existing Source Capacity (CCR, 2008). The County of San Diego DEH requested in their letter dated January 26, 2012 that the following items be included in a Source Capacity Study:

- Calculation of maximum day demand (MDD) of the water system.
- Technical Report to determine existing source capacity of each of the water sources and the system.
- Determination whether concurrent operation of non-system wells influence capacity of system wells.
- Influence of surface water export on capacity of water system.
- Capacity of water system's storage to meet MDD.

The intent of this Work Plan is to establish methods and procedures for completing the Source Capacity Study including conducting aquifer tests of Wells 1, 2 and 5 (Figure 2), and an analysis of the aquifer test data. The aquifer test and analysis will be used to estimate hydraulic properties of the local alluvial or fractured bedrock aquifers in the immediate area of the wells, and to assess the ability of on-site groundwater resources to meet the MDD and PHD of the water system under the following two scenarios:

- Scenario 1 Current customer base
- Scenario 2 Maximum build-out within the water system boundaries (based on existing legal parcels)

An analysis of the proposed volume of water to be exported will also be provided in conjunction with an evaluation of the water system's ability to meet its MDD under Scenarios 1 and 2 while exporting this volume.

#### 2. Information Required under CCR Section 64554(e)

The following information is provided to County of San Diego DEH as per the requirements of CCR Section 64554(e). Project specific responses to the requirements are noted in bold face type.

- Name and qualifications of person who will be conducting test: Arthur Storer Driscoll, III (Trey), PG No. 8511, CHG No. 936 and Steven L. Stuart, PE No. C79764
- 2. The proposed test's discharge rate, based on the design rate determined during well development and/or a step-drawdown test: Well 1 and Well 2 are planned to be tested at a production rate of 7 gallons per minute (gpm) and 55 gpm, respectively based on previous 24 hour well testing completed by San Diego Gas and Electric (SDG&E 1993; Appendix A). Well 5 will be tested at the maximum production rate of approximately 5 gpm. Actual production rates may vary based on field conditions.
- 3. A copy of a United States Geological Survey (USGS) 7.5 minute topographic map of the site at a scale of 1:24,000 or larger (1 inch equals 2,000 feet or 1 inch equals less than 2,000 feet. **See Figure 2.**
- 4. A well construction log, geologic log and electric log, if available. See Appendix B for well logs available for Wells 1 and 5.
- 5. Dates of well completion and well development, if know. See Table 1 below for available data.

- 6. Specifications for pump that will be used for the test and the depth as which it will draw water from the well. Pump type and pump intake will be verified when the wells are equipped with sounding tubes to measure water levels. Pump information will be recorded on field data sheets and provided in the Source Capacity Study Report.
- 7. A description of the methods that will be used to measure and maintain a constant pumping rate. A description is provided below in Section 5.3.
- 8. A description of the water level measurement method and measurement schedule. A description is provided below in Section 5.3.
- 9. For wells located in or having an influence on the aquifer from which the new well will draw water, a description of the wells' operating schedule and the estimated amount of groundwater to be extracted, while the new well is tested and during normal operations prior to and after the new well is in operation. A description is provided below in Section 5.2.
- 10. A description of the surface waters, water staff gauges, and production wells. A description is provided below in Sections 3 and 5.1.
- 11. A description of how the well discharge will be managed to ensure the discharge does not interfere with the test. A description is provided below in Section 5.3.
- 12. A description of how the initial test volume of water in the well's casing, or borehole if there is no casing at the time, will be addressed to ensure it has no impact on the test results. A description is provided below in Section 5.3.
- 13. A written description of the aquifer's annual recharge. A description is provided below in Section 7.

#### 3. Surface Water

The Site is located just west of the Tecate Divide, which is a series of ridgelines separating drainages that discharge toward the Salton Sea from drainages that discharge toward the Pacific Ocean. The Site is located in the Hill Hydrologic Subarea (HSA; 911.84), which is contained in the Campo Hydrologic Area (HA; 911.83) all within the Tijuana Hydrologic Unit (HU; 911.41) that drains toward the Pacific Ocean (Figure 3). The area of the Hill HSA watershed upstream of the LOSWC parcels is approximately 2,237 acres. The Hill HAS is drained by Campo Creek. The headwaters of Campo Creek start at the Tecate Divide at an elevation of approximately 4,600 feet above mean sea level (amsl). The elevation of Campo Creek at the Site is approximately 3,825 feet amsl where Campo Creek and Old Highway 80 intersect. A gaining reach of Campo Creek that is a perennial, naturally occurring spring is located on LOSWC APN 609-050-06. The spring flow is located approximately 530 feet west of Well 1 and 950 feet southeast of Well 2. Currently, there are no staff gauges or stream gauges located on Campo Creek

near the Site. A USGS stream gauge is located at the Campo Road (State Route 94) bridge over Campo Creek southwest of Campo (USGS 2013) (Figure 3). The USGS stream gauge on Campo Creek is not expected to be useful for the Site aquifers test evaluation because the area contributing runoff to this gauge is approximately 57,000 acres as compared to the 2,239 acre watershed contributing to the Site.

#### 4. Geology

The Site is located on the eastern portion of the Peninsular Range geomorphic province, which is a series of northwest-oriented mountain ranges separated by northwest trending valleys, sub-parallel to faults branching from the San Andreas Fault. The Peninsular Range geomorphic province extends from the Transverse Ranges near Los Angeles south through the Baja California peninsula. The geologic materials at the Site consist of residual soil, alluvium and weathered granitic rock overlying Cretaceous plutonic rocks of the composite Peninsular Ranges Batholith, consisting of a bedrock unit known as the Tonalite of La Posta (also referred to as the La Posta Quartz Diorite) (USGS 2004) (Figure 4). The bedrock unit is topographically expressed by low hills, valleys, and undulating topography atop an elevated highland, which includes the McCain Valley north of I-8, and the Campo Valley southwest of I-8.

#### **5.** Proposed Aquifer Tests

The aquifer tests using Wells 1, 2 and 5 as pumping wells will be conducted in accordance with CCR Section 64554(g). This work plan proposes to pump each operable well for a period of 10 days to qualify for the maximum capacity of no more than 50% of the production rate should it be concluded that the well draw from fractured rock rather than the alluvium associated with Campo Creek as per CCR Section 64554(g).

#### 5.1. Wells

There are two approved water sources (Well 2, PS Code 3700922-002 and Well 5, PS Code 3700922-005) covered by the DEH water supply permit. In addition, three wells (Well 1, PS Code 3700922-001, Well 3, PS Code 3700922-003 and Well 4, PS Code 3700922-004) are located within the water system boundaries that are not covered by the DEH permit. Well locations are depicted on Figure 5. See Table 1 for well completion date, use, depth, production and drawdown, depth to water, annular seal and geologic log information.

wen information								
Well	Completed Date	Use	Well Depth (feet) <sup>a</sup>	Well Production (gpm)/ Total Drawdown (feet)	Depth to Water (feet bgs)/ (date)	Annular Seal (feet)ª	Geologic Log⁴	
				LOSWC Well	s			
Well 1	7/28/1975 <sup>d</sup>	Irrigation Only	300 <sup>d</sup>	7/ 4.8⁵ (Airlifted 22 gpm when drilled)ª	8.3/ (4/15/93) <sup>b</sup> 38.0/ (9/9/11) <sup>g</sup>	50	0-50 not logged 50-300 fractured granite	
Well 2	1960ª	Active	200	55/ NA <sup>b</sup>	NA	50	NA	
Well 3	1939ª	Inactive	60	NA	NA	NA	NA	
Well 4	Pre-1950ª	Inactive	60	NA	NA	NA	NA	
Well 5	12/14/2007ª	Active	400 <sup>d</sup>	5/ 280ª.c (Airlifted 5 gpm when drilled)ª	NA	58.5	0 - 7 soil/alluvium 7 - 34 DG 34 - 400 fractured granite	
	Private Wells							
EW-1	1939 <sup>e</sup>	Private	100e	NA	12 to 57 <sup>e,f</sup>	NA	NA	
AC-1	NA	Private	NA	NA	NA	NA	NA	

	Table 1
Well	Information

Notes: a. County of San Diego DEH letter dated March 20, 2013.

b. Water pump test data form 24 hour test conducted by San Diego Gas and Electric (SDG&E 1993).

c. Air lift test (2 hour).

d. Well Completion Reports (Appendix B).

e. Personal communication from property owner on April 15, 2013.

f. Reported historic range of water level for Well EW-1.

g. Well had been pumping at time of measurement.

NA = not available.

#### 5.2. Existing Well Pumping

Currently, all potable water for LOSWC is supplied from Well 2. The average daily water use reported for Well 2 is 13,200 gallons per day (gpd) for three years of record from 2009-2011 (County of San Diego 2013). It is expected that Well 2 will operate at an approximate rate up to a maximum of 20,000 gpd prior to and following aquifer testing to meet water supply requirements of LOSWC customers. Although Well 5 is part of the potable water system, it currently is unable to produce groundwater at a rate sufficient for its use as a primary source of potable water and is seldom used (pers. comm. 2013 Najor N 17 July). A new well is planned to be constructed to replace existing Well 5. In addition, private wells EW-1 and AC-1 are expected to pump daily to meet the domestic supply requirements for two residences.

#### 5.3. Aquifer Test Methods and Procedures

Submersible pumps are currently installed in Wells 1, 2 and 5. In fractured rock aquifers, it is typical for the pumping water level to draw down substantially to the depth of principal water bearing fractures under extended pumping at maximum rates. Constant rate tests have been performed on Wells 1 and 2 (SDG&E 1993; Appendix A). Therefore, we propose to utilize the information to establish the optimal pumping rate for the 10-day constant rate test. Prior to well testing, pressure transducers will be installed into either a sounding tube or the well casing. On-site Wells 1-5, privately owned and operated Well EW-1 and an off-site, privately owned well (on APN 609-050-18-00) near Well 2 are proposed to be monitored during the aquifer testing. Pumping of Well 5 as part of the aquifer testing is contingent on the well's ability to produce groundwater. Automatic water level readings will be recorded at a minimum of the following frequencies during each well test:

Manual Water Level Monitoring Frequency				
Time Since Pumping Started	Monitoring Frequency			
0 to 10 minutes	30 seconds			
>10 to 30 minutes	2 minutes			
>30 minutes to 2 hours	10 minutes			
>2 hours to 12 hours	30 minutes			
>12 to 24 hours	1 hour			
>24 hours to 4 days	8 hours			
5 days to 10 days	24hours			

Table 2Manual Water Level Monitoring Frequency

a .Daily manual measurements, transducers will be programmed to record data at 15 minute intervals.

Prior to the aquifer tests, water levels will be recorded for a period of at least ten days to identify water level trends. In addition, barometric pressure will be recorded throughout the period of water level measurements. The well pump valving, flow meter, and water level monitoring equipment will be tested at least 24 hours prior to the start of the tests. The minimum recording frequency for water level monitoring during recovery will be measured according to Table 2. Manual water level measurements will be recorded at the start of the test, periodically over the test interval and during recovery after pumping ceases in order to confirm the accuracy of the pressure transducer measurements.

Flow will be measured using an in-line flow meter or similar equipped with a flow totalizer. Flow rates will be measured according to the frequency indicated in Table 2

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Notes:

while personnel are present on the Site during the tests. Field personnel will monitor flow rates and regulate flow with a gate valve to maintain the desired constant flow rate throughout the duration of the tests. A check valve will be installed in the discharge line to avoid backflow of water into the well when the pump is shut off.

Currently, it is planned that water pumped during the aquifer tests will be sold off-site. This will avoid wasting water and the requirement to obtain a National Pollutant Discharge Elimination System (NPDES) Permit to legally discharge the water to Campo Creek. Currently, it is planned that there will be no discharge to the ground. Well 1 aquifer testing, water will be pumped to portable 12,000-gallon water towers and trucked off-site. For Well 2 aquifer testing, modifications will be required to the DEH-regulated potable system to allow for overflow of the existing potable water tanks. It is planned to capture overflow from the potable system during aquifer testing of Well 2 and sell the water off-site. A plan will be submitted to the DEH for approval of modifications to the potable system to accommodate aquifer testing of Well 2. For Well 5 aquifer testing, water will be pumped to a portable water tank and trucked off-site. A plan will be submitted to the DEH for approval of modifications to the potable system to accommodate aquifer testing of Well 5. Well 5 may not be tested if it is determined that the well cannot sustain prolonged periods of pumping. By trucking the water off-site, recharge to the underlying aquifer will be eliminated. Thus, this will ensure that well water discharge does not interfere with the aquifer tests.

The initial test volume of water in the well's casing will not have an impact on test results as the wells are planned to be pumped for 10 days. For example, the approximate casing volume for Well 1 of 440 gallons will be evacuated from the well within one hour of pumping at a rate of 7 gpm. Only later time data, after the initial volume of water in the well's casing has been evacuated, will be used in the well test analyses.

The recovery period will be at a minimum the duration of the aquifer tests for wells that are not required to supply the potable water system. Water level transducers will be left in the pumping well and observation wells for a period of at least ten days beyond the recovery period.

#### 6. Proposed Well Test Analysis

#### 6.1. Aquifer Hydraulic Properties Analysis

Aquifer transmissivity (the rate at which water flows through a vertical strip of the aquifer 1 foot wide and extending through the full saturated thickness, under a hydraulic gradient of 1 or 100 percent) will be estimated using the Copper-Jacob approximation to the Theis equation (Cooper-Jacob 1946) as follows:

$$T = \frac{2.303 \text{ Q}}{4 \pi \Delta s}$$

Where:

T = transmissivity (feet<sup>2</sup>/day) [multiply by 7.48 to get units of gpd/ft] Q = average pumping rate (feet<sup>2</sup>/day) [multiply GPM by 193]  $\pi$  = pi (3.14)  $\Delta$ S = difference in drawdown over one log cycle (feet)

The aquifer coefficient of storage (also called storativity) is the volume of water released from storage per unit decline in hydraulic head in the aquifer per unit area of the aquifer. Due to well loses and inefficiency of the pumping well, an observation well is required to calculate the coefficient of storage. The coefficient of storage will be estimated using the Copper-Jacob approximation to the Theis equation (Cooper-Jacob 1946) as follows:

#### $S = 2.25 T t_0 / r^2$

Where:

S = Coefficient of Storage (dimensionless) T = transmissivity (feet<sup>2</sup>/day)  $t_o$  = intercept with x-axis, time (days) r = distance to observation well (feet)

An estimate of groundwater drawdown at the nearest residential well (EW Well) induced by project pumping will be estimated using the Cooper-Jacobs approximation of the Theis non-equilibrium flow equation (USGS 1962):

$$s = \frac{264 \text{ Q}}{\text{T}} \quad \log_{10} \frac{0.3 \text{ Tt}}{\text{r}^2 \text{S}}$$

Where:

s = predicted drawdown (feet) Q = average pumping rate (GPM) T = Transmissivity (gpd/ft)

t = time (days) r = distance from pumping well (feet) S = coefficient of storage (dimensionless)

Based on the actual results of the drawdown data collected during the aquifer tests, the use of additional analysis methods will be evaluated, as appropriate, in consultation with the County Groundwater Geologist. The information from the well test analysis will be used to assign capacities for LOSWC Wells and determine potential well interference to neighboring wells.

#### 7. Annual Storage and Recharge

The groundwater storage capacity was calculated using conceptual estimates of the saturated thickness of the three hydrologic units (alluvium, DG, and fractured granitic bedrock) underlying the watershed of the groundwater resource study area (2,237 acres). Based on seismic traverses conducted south of I-8 and north of Project site, the alluvial thicknesses are estimated at 10 to 55 feet (Environmental Navigation Services, 2008). Alluvial thicknesses north of I-8 are unknown at this time. Additional investigation would be required to verify these thicknesses. Limited historical water level data report that the depth to water at the site has ranged from 8 to 57 feet below top of casing in Wells 2 and EW-1 (Table 1). Perennial spring discharge on the Site suggests a groundwater table near the surface in portions of the alluvium. For this analysis, the saturated thicknesses of the alluvium, DG, and fractured granitic rock were assumed to be 10 feet, 20 feet, and 500 feet, respectively for areas where Mottsvile Soil Types are mapped. The saturated thicknesses of the alluvium, DG, and fractured granitic rock were assumed to be 0 feet, 10 feet, and 500 feet, respectively for areas where all other soil types were mapped. It is recognized that the saturated thickness of the hydrologic units respond to water level fluctuations due to elevated periods of precipitation, drought and groundwater extraction. These estimates of saturated thickness assume the aquifer is full. The estimated specific yields for each hydrologic unit were obtained from County estimates (County of San Diego 2010). The specific yield associated with the alluvium is 10%. The specific yield for the residuum is 5%. The specific yield for fractured bedrock is weighted depending on location within the groundwater resource study area. A value of 0.1% in valley areas and a value of 0.01% in steep slope areas is a generally accepted estimate of average conditions in fractured rock aquifers in the County (County of San Diego 2010). A specific yield of 0.1% was applied to the area of the Mottsville Soil Types and a specific yield of 0.01% was applied to all other soil types within the 2,237 acre study area. The weighted average specific yield for the fractured rock is 0.02%. By multiplying the area weighed acreage of the geologic units in the study area by the estimated specific yield and by the saturated thickness for each hydrogeologic unit, the

total groundwater in storage within the study area is estimated to be 1,935 acre-feet. The total groundwater in the alluvium, saturated DG, and fractured granitic rock is estimated to be 361 acre-feet, 1,299 acre-feet, and 274 acre-feet, respectively. These estimated values require confirmation by conducting additional geophysical investigations, drilling exploratory boreholes and performing aquifer test to determine site specific aquifer properties.

As per CCR Section 64554(e), a written description of the aquifer's annual recharge is required to be included in this Workplan. Natural recharge to underlying aquifer occurs when the amount of rainfall entering the area exceeds the amount subsequently lost to runoff and evapotranspiration and the soil moisture capacity is met. To estimate annual recharge it is necessary to divide the aquifers into surface areas in which storage and potential recharge can be accessed by a pumping well. Typically, the watershed is defined by surface divides (ridgelines) that separate surface flow. It should be noted that surface boundaries such as ridgelines do not preclude subsurface groundwater flow between watersheds but are used to suitably approximate available recharge. The watershed was defined by the boundaries of the Hill HSA depicted in Figure 3. This analysis also limited the study area to the watershed upstream of the parcel where the southernmost well (Well 5) is located. The area of the watershed contributing to the onsite wells was estimated at 2,237 acres (Figure 6).

Annual recharge can vary considerably depending on total precipitation accumulated during any given year. In dry years, no recharge may occur whereas in wet years considerable recharge to the aquifer will occur.

A soil moisture balance method was used to evaluate groundwater recharge within the 2,237 acre groundwater resource study area. The calculation assumes that groundwater cannot flow into or out of the study area from larger distances in response to local groundwater pumping. The volume of groundwater recharge was calculated in monthly intervals for a span of 30 years, which includes periods of elevated rainfall and drought.

Groundwater recharge for the study area was estimated using a monthly soil-moisture balance approach based on the computer code provided in the San Diego County Department of Planning and Land Use (DPLU) General Plan Update Groundwater Study (County of San Diego 2009) and similar to the methodology used in the RECHARG2 program developed by Dr. David Huntley at San Diego State University (SDSU). The monthly recharge equation is as follows:

 $\operatorname{Recharge}(i) = \operatorname{PPT}(i) - \operatorname{RO}(i) - \operatorname{PET}(i) - (\operatorname{SMC-SM}(i))$ 

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where:

Recharge(*i*) = Recharge during month *i* PPT(*i*) = Rainfall during month *i* RO(*i*) = Runoff during month *i* PET(*i*) = Potential Evapotranspiration during month *i* SMC = Soil Moisture Capacity SM(*i*) = Soil Moisture at beginning of month *i* 

Excel spreadsheets were developed for data input, groundwater recharge calculations, and the comparison of the cumulative effect on groundwater in storage.

#### **Data Compilation**

The data required to provide groundwater recharge estimates were obtained from various sources and are discussed below.

#### Precipitation

Monthly rainfall data for a 30-year period, July 1982 through July 2012, were used in this analysis. The data were collected at the gauging station located in Tierra del Sol. The Tierra del Sol precipitation data were provided by the County of San Diego (Rand, pers. comm. 2012). There are 15 out of 361 monthly records for which precipitation data was not recorded. In such instances, a value of 0 inches was conservatively assigned where rainfall data could not otherwise be obtained. The Tierra del Sol precipitation data likely underestimates precipitation falling on the Site by 20% to 25% due to its location on a ridgeline. Additionally, the Site watershed is located at an elevation between 3,825 feet amsl and 4,600 feet amsl. The Tierra del Sol rain gauge is located at 3,990 feet amsl but further south of the Laguna Mountains. The County of San Diego DPLU Precipitation 30-Year Average (1971-2001) Map indicates that the Site watershed is located in an area of average annual precipitation of 18 to 21 inches per year. Whereas the Tierra del Sol rain gauge is located in an area of 15 to 18 inches per year (DPLU 2009). Therefore, the precipitation data used is this analysis underestimates recharge as the data have not been adjusted (Increased) to account for higher precipitation at the Site.

#### **Evapotranspiration**

Reference evapotranspiration (ETo) data are provided by the California Irrigation Management Information System (CIMIS) throughout the state of California. CIMIS maintains a number of weather stations statewide that provide the meteorological parameters used to calculate published reference ETo values. These ETo values are dependent on parameters including incident solar radiation, vapor pressure, air temperature, and cloud cover. The ETo values published by CIMIS and used in this analysis overestimate actual rates of evapotranspiration at the Site because the CIMIS ETo is a calculated water need for well-watered grass rather than for unirrigated native vegetation. CIMIS has designated the area surrounding the Site as Zone 16 (CIMIS 1999). The monthly average ETo values provided by CIMIS for Zone 16 were used in this analysis. The total annual ETo for Zone 16 is reported as 62.5 inches/year (CIMIS 1999).

#### Soil Moisture Capacity

Soil moisture capacity or water-holding capacity is the capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point (USDA 1973). Soil water-holding capacity is dependent on the soil type and site-specific soil properties, including rock fragments, organic matter, bulk density, osmotic pressure, texture, and rooting depth (USDA 1998). The United States Department of Agriculture (USDA) has defined a range of water-holding capacity values for each type of soil present in San Diego County (USDA 1973). The mean value of the reported range of values for each soil type was used as the soil moisture capacity for this analysis. Soil type and coverage on the Site were provided by SanGIS based on the USDA mapping (Figure 6). Water holding capacity by soil type is provided in Table 3.

#### Runoff

Because there are no stream gaging stations in close proximity to the Site, runoff must be estimated. The estimated runoff values used in this analysis are derived from the Natural Resources Conservation Service (NRCS) curve number method (CNM) as expounded in the County of San Diego Hydrology Manual (2003). The CNM was designed to estimate runoff for watersheds in which no direct measurement was available. The CNM is based on a simplified infiltration model of runoff and empirical approximations.

In order to compute runoff (Q) using the CNM, two parameters must be known: precipitation (P) and the maximum soil moisture retention after runoff has begun (S), based on the following relationship.

$$Q = (P-0.2S)^2/(P+0.8S)$$

The monthly precipitation data used is the 30-year period (1982–2012) of record for the Tierra del Sol gauging station provided by the County of San Diego (Rand, pers. comm. 2012). The maximum soil moisture retention (S) is a function of soil type, with all soils having been classified into one of four hydrologic groups, A through D. Soils are classified by the USDA's NRCS into four hydrologic soil groups based on the soil's runoff potential. The four hydrologic soils groups are A, B, C, and D. Group A generally has the smallest runoff potential, highest infiltration rates and group D the greatest runoff potential, lowest infiltration rates, and lowest soil moisture retention. The soils in the study area fall into hydrologic groups A (86%), B (7%), C ( 6%) and D ( 1%) as shown in Table 3.

Soil Symbol	Soil Name and Description	Hydrologic Soil Group	Soil Water Holding Capacity (inches)	Mean Soil Water Holding Capacity (inches)	Area (Acres)	Percent of Total Area Examined
AcG	Acid Igneous Rock Land	D	-	-	14	0.006%
KcC	Kitchen Creek loamy coarse sand, 5%–9% slope	В	3–5.5	4.25	88	3.9%
KcD2	Kitchen Creek loamy coarse sand, 9%– 15% slope, eroded	В	3–5.5ª	4.25ª	51	2.3%
LaE2	La Posta loamy coarse sand, 5%– 30% slope, eroded	A	2-3	2.5	1,236	55.2%
LaE3	La Posta loamy coarse sand, 5%– 30% slope, severely eroded	A	1–2	1.5	72	3.2%
LcE2	La Posta rocky loamy coarse sand, 5%– 30% slope, eroded	A	1–2	1.5	247	11%
Lu	Loamy Alluvial Land	В	6-9	7.5	26	1.2%
MvC	Mottsville loamy coarse sand, 2%–9% slope	A	4–5	4.5	361	16.1%
ToE2	Tollhouse rocky coarse sandy loam, 5% to 30% slope, eroded	С	1-2	1.5	27	1.2%
ToG	Tollhouse rocky coarse sandy loam, 30% to 65% slope	С	1-2 <sup>b</sup>	1.5 <sup>b</sup>	117	5.2%

Table 3.Soil Types and Soil Moisture-Holding Capacities

Soil Symbol	Soil Name and Description	Hydrologic Soil Group	Soil Water Holding Capacity (inches)	Mean Soil Water Holding Capacity (inches)	Area (Acres)	Percent of Total Area Examined
					2,239	100%

Source: USDA 1973, Soil Survey San Diego Area, California

<sup>a</sup> No soil water holding capacity provided. USDA 1973 states that soil group KcD2 is similar to KcC

<sup>b</sup> No soil water holding capacity provided. USDA 1973 states that soil group ToG is similar to ToE2

The CNM requires the selection of a curve number based on a combination of soil conditions, land use (ground cover), and hydrologic conditions to assign a runoff factor to the area. These runoff factors, called runoff curve numbers (CNs), indicate the runoff potential of an area. The higher the CN, the higher the runoff potential (County of San Diego 2003). Based on a desert shrub ground cover and good hydrologic condition, CNs developed for soil groups A, B, C and D are 49, 68, 79 and 84, respectively (Table 4-2 of the County Hydrology Manual, County of San Diego 2003).

The maximum soil moisture retention (S) is calculated from the curve numbers based on the following relationship:

#### S = 1000/CN-10

Using the monthly precipitation record and the assigned curve numbers, anticipated monthly runoff values for the Site area were calculated for the 30-year period of record of the precipitation data. A calibration analysis included in the 2010 General Plan Update Groundwater Study (County of San Diego 2009) compared the runoff values using the NRCS curve number method to existing conditions for periods when historical groundwater level data were available in the Lee Valley Basin. The County concluded that runoff values calculated using the NRCS curve number method were overestimated. A reasonable relative match between calculated groundwater in storage compared to historical groundwater levels was obtained by applying an adjustment factor of 0.5 to the calculated runoff values. This adjustment factor of 0.5 was used in this analysis. For example, using the average annual precipitation recorded at Tierra del Sol from 1982 to 2012 of 11.3 inches, the average annual runoff would be 0.51 inches, or about 4.5% of precipitation for the 2,239 acre contributing watershed.

The average annual recharge calculated over the 30-year period from 1982 to 2012 for the 2,239 acre contributing watershed is estimated at 134.32 acre-feet per year. The cumulative estimated recharge over the 30-year period is 4,030 acre-feet. Monthly and cumulative recharge from 1982 to 2012 is depicted in Exhibit 1. The majority of recharge occurs during large precipitation events. For example, in January and February 1993 monthly precipitation totals of 9.89 inches and 5.25 inches respectively results in

recharge of 893 acre-feet and 411 acre-feet, respectively. Thus in dry years, little to no recharge to the aquifer occurs. Calculations are provided in the attached excel spreadsheet (Appendix C).

The above soil moisture balance method is a conservative estimate of natural recharge to the 2,239 acre contributing watershed.



#### 7.1. Long-term Groundwater Availability

Groundwater demand was evaluated for one scenario:

1. Water demand based on existing use.

Scenario 1 evaluates groundwater recharge based on the existing water demand for LOSWC, Golden Acorn Casino and approximately 20 residences with an assumed water demand of 0.5 acre-feet per year (afy) per residence. Existing water demands are presented in Table 4.

Land Use	Quantity	Water Demand Per Unit (acre-feet/year)	Total Water Demand (acre-feet/year)	Total Water Demand Over 30 Years
LOSWC	95	0.15	14.5	435
Golden Acorn Casino	1	22.40ª	22.40	672
Existing Single-Family Residential Units	20 <sup>b</sup>	0.5	10	300
	Total	Existing Water Demand	46.9	1,407

Table 4Scenario 1—Existing Conditions

**Notes:** a. Environmental Navigation Services. 2008.

b. Estimate based on 8 County well permits plus 12 additional lots zoned as rural residential (Figure 5).

The results of the analysis show that for the existing water demand (Scenario 1), the volume of groundwater in storage remains above the 50% significance threshold. Assuming minimum water demand (existing use conditions), the minimum volume of groundwater in storage over the 30-year period was approximately 1,544 acre-feet, or 80% of the maximum groundwater storage capacity for Scenario 1. The average volume of groundwater in storage under Scenario 1 is approximately 1,807 acre-feet (Exhibit 2).



#### 8. Reporting Requirements

The final Source Capacity Study will include the following elements:

- Meeting with County to discuss results and finalize methods to be included in report.
- Discussion of field procedures.
- Tabulated monitoring data for each groundwater extraction test.
- Interpretation of monitoring data.
- Raw field monitoring data (in appendices).
- Appropriate graphics and tables.

A draft outline of the Source Capacity Study is included as Appendix D.

#### 9. References

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- USGS. 2004. "Preliminary Geologic Map of the El Cajon 30' x 60' Quadrangle, Southern California." Version 1.0. 1:100,000. Compiled by V.R. Todd. USGS.
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# FIGURES

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# **APPENDIX** A

## SDG&E Water Pump Tests Wells 1 and 2

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Water Pump Test

Live Oak Springs Water Co 37820 Old Hwy 80

TEST DATE: 4/15/93 PLANT: Well #1

A test was made on this submersible well pump and the following information was obtained.

EQUIPMENT

PUMP:No DataMOTOR:FranklinHP:.75METER:1126531

SERIAL NO.: SERIAL NO.: N/A 2801074910

TEST RESULTS

Changed.

Test 1

Discharge PSI	55.0
Discharge head feet	127.1
Standing water level feet	8.6
Drawdown feet	4.8
Pumping water level feet	13.4
Total head feet	140 5
GPM	7
Gallons per foot of drawdown	1.5
Acre feet pumped per 24 hours	0.031
KW input to motor	1.4
HP input to motor	1.9
Motor load in %	170 1
Measured speed of pump RPM	±,0.1
KWH per acre foot	1086.2
Overall plant efficiency in %	13 2
Water meter, GPM	13.6

This pump is operating inefficiently. The inefficiency is most likely caused by pump wear, the failure of the pump design to meet existing conditions or a combination of both.

If you have any further questions, please contact Angela Miller at (619) 537-0954.

#### ANNUAL PUMPING COST ANALYSIS

Live Oak Springs Water Co

TEST DATE: 4/15/93

Plant	No.:	Well #1
Meter	No.:	1126531
Horsep	ower:	.75

The following pumping cost analysis is presented as an aid to your cost accounting. The analysis is an estimate, based on the pump test data and your use in the previous 12-month period.

A reduction in energy usage and cost would occur, as shown below, if this pump was redesigned or rebuild.

It is assumed for the purpose of this analysis, that Overall Plant Efficiency can be improved to 35 percent; that water requirements will remain the same as for the past year; and all operating conditions (annual hours of operation and total pumping lift) will remain the same as they were at the time of the pump test.

	EXISTING EFFICIENCY	IMPROVED EFFICIENCY	APPROXIMATE SAVINGS
Total annual kWhrs Total annual cost \$ kW input Hours of operation Equivalent 24 hr. days Acre feet per 24 hour day Acre feet per year	$\begin{array}{r} 4200\\ 421.68\\ 1.4\\ 3000\\ 125.0\\ 0.031\\ 3.9 \end{array}$	$ \begin{array}{r} 1500\\ \$ 150.60\\ 0.5\\ 3000\\ 125.0\\ 0.031\\ 3.9 \end{array} $	2700 \$ 271.08 0.9
Average cost per kWhr \$ Average cost per hour \$ Average cost per acre ft.\$ KWH per acre ft. Overall plant efficiency %	0.1004 0.14 109.06 1086.2 13.2	\$ 0.1004 \$ 0.05 \$ 38.95 387.9 % 35.0	\$ 0.09 \$ 70.11



Water Pump Test

a di ta cha

Live Oak Springs Water Co 37820 Old Hwy 80

station and a station of the state of the s

TEST DATE: 4/15/93 PLANT: Well #2

A test was made on this submersible well pump and the following information was obtained.

EQUIPMENT

PUMP: MOTOR: HP: METER:	No Data Franklin 3 639881		SERIAL NO.: SERIAL NO.:	24 g	N/A 2343167014
			TEST RESULTS		
			Test 1		
Discharge PSI Discharge head fee Standing water lev Drawdown feet Pumping water leve	et el feet el feet	11	42.0 97.0		
Total head feet GPM Callers per feet o	fdraudeun		55		
Acre feet pumped p KW input to motor	er 24 hours		0.243 3.3		
HP input to motor Motor load in %			4.4 109.1		
Measured speed of KWH per acre foot	pump RPM		325.9		
Water meter, GPM	clency in %				

Due to an obstruction in the well, we were unable to obtain a pumping water level; therefore, we were unable to quote the total head or overall efficiency of the pumping plant.

If you have any further questions, please contact Angela Miller at (619) 537-0954. 1.0.40

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Live Oak Springs Water Co

#### TEST DATE: 4/15/93

Plant	No.:	Well #2
Meter	No.:	639881
Horse	power:	3

The following pumping cost analysis is presented as an aid to your cost accounting. The analysis is an estimate, based on the pump test data and your use in the previous 12-month period.

#### EXISTING EFFICIENCY

Total annual kWhrs		17299
Total annual cost	\$	1594.93
kW input		3.3
Hours of operation		5242
Equivalent 24 hr. days		218.4
Acre feet per 24 hour da	У	0.243
Acre feet per year	19 19	53.1
Average cost per kWhr	\$	0.0922
Average cost per hour	\$	0.30
Average cost per acre ft	.\$	30.05
KWH per acre ft.		325.9
Overall plant efficiency	00	



Well Logs (Confidential; not included)

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Excel Spreadsheet (Digital File Available Upon Request)

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			INPUT			OUTPUT					
	Madd	Mada									
	Monthly	Monthly			Water			Soil		~	
Time	Avg.	Avg.	Mean Precip	Mean Precip	Demand	Runoff (in)	P-(PET+RO)	Moisture	Recharge	Storage	
	Reference	Reference	(inches)	(feet)	(AF)		(in)	(in)	(AF)	(AF)	
	ET (inches)	ET (feet)			()			()			
7/1/1982	9 30E±00	7 75E-01	0.00E+00	0.00E±00	5.63E±00	0.00E+00	-9 30E±01	3 70E±01	0.00E+00	1.03E±03	
8/1/1982	8.37E±00	6.98E-01	6.80E-01	5.67E-02	5.63E+00	2.81E-02	-7.69E+01	8 10E+00	0.00E+00	1.93E+03	
0/1/1982	6.37E+00	5.25E-01	2 20E 01	2.67E-02	1.60E+00	0.00E+00	5 09E+01	3.10E+00	0.00E+00	1.92E+03	
9/1/1982	0.30E+00	3.23E-01	3.20E-01	2.07E-02	4.09E+00	0.00E+00	-3.98E+01	3.22E+00	0.00E+00	1.92E+03	
10/1/1982	4.34E+00	3.02E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-4.34E+01	1.73E+00	0.00E+00	1.91E+03	
11/1/1982	2.40E+00	2.00E-01	7.10E-01	5.92E-02	3.28E+00	3.54E-02	-1.69E+01	1.36E+00	0.00E+00	1.91E+03	
12/1/1982	1.55E+00	1.29E-01	0.00E+00	0.00E+00	2.81E+00	0.00E+00	-1.55E+01	1.10E+00	0.00E+00	1.91E+03	
1/1/1983	1.55E+00	1.29E-01	1.92E+00	1.60E-01	2.81E+00	1.07E+00	2.63E+00	3.72E+00	0.00E+00	1.91E+03	
2/1/1983	2.52E+00	2.10E-01	3.35E+00	2.79E-01	2.35E+00	3.85E+00	4.45E+00	8.24E+00	0.00E+00	1.90E+03	
3/1/1983	4.03E+00	3.36E-01	8.32E+00	6.93E-01	2.81E+00	2.04E+01	2.25E+01	2.32E+01	2.55E+02	1.94E+03	
4/1/1983	5.70E+00	4.75E-01	1.36E+00	1.13E-01	3.28E+00	4.14E-01	-4.38E+01	1.49E+01	0.00E+00	1.93E+03	
5/1/1983	7.75E+00	6.46E-01	1.20E-01	1.00E-02	4.22E+00	0.00E+00	-7.63E+01	1.80E+00	0.00E+00	1.93E+03	
6/1/1983	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	4.15E-01	0.00E+00	1.92E+03	
7/1/1983	9.30E+00	7.75E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-9.30E+01	1.07E-01	0.00E+00	1.92E+03	
8/1/1983	8.37E+00	6.98E-01	1.18E+00	9.83E-02	5.63E+00	2.63E-01	-7.22E+01	3.99E-02	0.00E+00	1.91E+03	
9/1/1983	6.30E+00	5.25E-01	9.50E-01	7.92E-02	4.69E+00	1.22E-01	-5.36E+01	1.94E-02	0.00E+00	1.91E+03	
10/1/1983	4.34E+00	3.62E-01	1.06E+00	8.83E-02	4.22E+00	1.81E-01	-3.30E+01	1.25E-02	0.00E+00	1.90E+03	
11/1/1983	2.40E+00	2.00E-01	1.42E+00	1.18E-01	3.28E+00	4.72E-01	-1.03E+01	1.09E-02	0.00E+00	1.90E+03	
12/1/1983	1.55E+00	1.29E-01	0.00E+00	0.00E+00	2.81E+00	0.00E+00	-1.55E+01	8.87E-03	0.00E+00	1.90E+03	
1/1/1984	1.55E+00	1.29E-01	2.40E-01	2.00E-02	2.81E+00	0.00E+00	-1.31E+01	7.47E-03	0.00E+00	1.89E+03	
2/1/1984	2.52E+00	2.10E-01	0.00E+00	0.00E+00	2.35E+00	0.00E+00	-2.52E+01	5.37E-03	0.00E+00	1.89E+03	
3/1/1984	4.03E+00	3.36E-01	4.00E-02	3.33E-03	2.81E+00	0.00E+00	-3.99E+01	3.19E-03	0.00E+00	1.89E+03	
4/1/1984	5.70E+00	4.75E-01	1.20E-01	1.00E-02	3.28E+00	0.00E+00	-5.58E+01	1.54E-03	0.00E+00	1.88E+03	
5/1/1984	7.75E+00	6.46E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-7.75E+01	5.63E-04	0.00E+00	1.88E+03	
6/1/1984	8.70E+00	7.25E-01	1.20E-01	1.00E-02	5.16E+00	0.00E+00	-8.58E+01	1.85E-04	0.00E+00	1.88E+03	
7/1/1984	9.30E+00	7.75E-01	2.80E+00	2.33E-01	5.63E+00	2.60E+00	-6.76E+01	7.53E-05	0.00E+00	1.87E+03	
8/1/1984	8.37E+00	6.98E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-8.37E+01	2.55E-05	0.00E+00	1.86E+03	
9/1/1984	6 30E+00	5 25E-01	0.00E+00	0.00E+00	4 69E+00	0.00E+00	-6 30E+01	1 13E-05	0.00E+00	1.86E+03	
10/1/1984	4 34E+00	3.62E-01	4.00F-02	3 33E-03	4 22E+00	0.00E+00	-4 30E+01	6 50E-06	0.00E+00	1.86E+03	
11/1/1984	2.40E+00	2.00E-01	8 30E-01	6.92E-02	3 28E+00	7 29E-02	-1 58E+01	5 29E-06	0.00E+00	1.85E+03	
12/1/1984	1.55E+00	1 29E-01	3.62E+00	3.02E-01	2.81E+00	4 53E+00	1.62E+01	1.52F+01	1.25E+01	1.86E+03	
1/1/1985	1.55E+00	1.29E-01	9.80F-01	8.17E-02	2.81E+00	1.37E-01	-5.84E+00	1.32E+01	0.00E+00	1.86E+03	
2/1/1085	2.52E+00	2 10E 01	0.00E+00	0.00E+00	2.35E+00	0.00E+00	2.52E+01	5.72E+00	0.00E+00	1.86E+03	
3/1/1985	4.03E+00	3.36E-01	0.00E+00	0.00E+00	2.33E+00	0.00E+00	-4.03E±01	2.21E+00	0.00E+00	1.85E±03	
4/1/1085	5.70E+00	4 75E 01	0.00E+00	0.00E+00	3 28E+00	0.00E+00	5 70E+01	7 70E 01	0.00E+00	1.85E+03	
5/1/1085	7.75E+00	4.75E-01	0.00E+00	0.00E+00	3.28E+00	0.00E+00	-3.70E+01	2.28E.01	0.00E+00	1.85E+03	
6/1/1985	7.73E+00	0.40E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-7.73E+01	2.26E-01	0.00E+00	1.63E+03	
0/1/1983	8.70E+00	7.23E-01	4.00E-02	5.55E-05	5.62E+00	0.00E+00	-8.00E+01	0.34E-02	0.00E+00	1.84E+03	
//1/1983	9.30E+00	7.73E-01	1.10E+00	9.17E-02	5.63E+00	2.00E-01	-8.22E+01	2.13E-02	0.00E+00	1.84E+03	
0/1/1985	6.37E+00	0.98E-01	0.00E+00	0.00E+00	3.03E+00	0.00E+00	-0.37E+01	7.02E-03	0.00E+00	1.03E+03	
9/1/1983	0.30E+00	3.23E-01	3.10E-01	4.23E-02	4.09E+00	4.09E-03	-3.79E+01	3.29E-03	0.00E+00	1.83E+03	
10/1/1983	4.54E+00	3.62E-01	4.70E-01	3.92E-02	4.22E+00	1.99E-03	-3.8/E+01	1.99E-03	0.00E+00	1.82E+03	
11/1/1985	2.40E+00	2.00E-01	3.51E+00	2.93E-01	3.28E+00	4.25E+00	6.85E+00	6.85E+00	0.00E+00	1.82E+03	
12/1/1985	1.55E+00	1.29E-01	3.90E-01	3.25E-02	2.81E+00	2.14E-05	-1.16E+01	4.36E+00	0.00E+00	1.81E+03	
1/1/1986	1.55E+00	1.29E-01	5.10E-01	4.25E-02	2.81E+00	4.09E-03	-1.04E+01	3.05E+00	0.00E+00	1.81E+03	
2/1/1986	2.52E+00	2.10E-01	2.25E+00	1.88E-01	2.35E+00	1.57E+00	-4.2/E+00	2.74E+00	0.00E+00	1.81E+03	
3/1/1986	4.03E+00	3.36E-01	2.21E+00	1.84E-01	2.81E+00	1.50E+00	-1.97E+01	1.60E+00	0.00E+00	1.81E+03	
4/1/1986	5.70E+00	4.75E-01	4.00E-02	3.33E-03	3.28E+00	0.00E+00	-5.66E+01	4.5/E-01	0.00E+00	1.80E+03	
5/1/1986	7.75E+00	6.46E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-7.75E+01	1.13E-01	0.00E+00	1.80E+03	
6/1/1986	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	2.87E-02	0.00E+00	1.79E+03	
7/1/1986	9.30E+00	7.75E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-9.30E+01	7.50E-03	0.00E+00	1.79E+03	
8/1/1986	8.37E+00	6.98E-01	1.60E-01	1.33E-02	5.63E+00	0.00E+00	-8.21E+01	2.43E-03	0.00E+00	1.78E+03	
9/1/1986	6.30E+00	5.25E-01	0.00E+00	0.00E+00	4.69E+00	0.00E+00	-6.30E+01	1.04E-03	0.00E+00	1.78E+03	
10/1/1986	4.34E+00	3.62E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-4.34E+01	5.83E-04	0.00E+00	1.77E+03	
11/1/1986	2.40E+00	2.00E-01	6.70E-01	5.58E-02	3.28E+00	2.59E-02	-1.73E+01	4.63E-04	0.00E+00	1.77E+03	
12/1/1986	1.55E+00	1.29E-01	4.30E-01	3.58E-02	2.81E+00	6.16E-04	-1.12E+01	4.00E-04	0.00E+00	1.77E+03	
1/1/1987	1.55E+00	1.29E-01	1.50E+00	1.25E-01	2.81E+00	5.55E-01	-1.05E+00	3.93E-04	0.00E+00	1.77E+03	
2/1/1987	2.52E+00	2.10E-01	6.30E-01	5.25E-02	2.35E+00	1.79E-02	-1.89E+01	3.06E-04	0.00E+00	1.76E+03	
3/1/1987	4.03E+00	3.36E-01	0.00E+00	0.00E+00	2.81E+00	0.00E+00	-4.03E+01	1.80E-04	0.00E+00	1.76E+03	
4/1/1987	5.70E+00	4.75E-01	1.60E-01	1.33E-02	3.28E+00	0.00E+00	-5.54E+01	8.66E-05	0.00E+00	1.76E+03	
5/1/1987	7.75E+00	6.46E-01	1.20E-01	1.00E-02	4.22E+00	0.00E+00	-7.63E+01	3.18E-05	0.00E+00	1.75E+03	
6/1/1987	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	1.01E-05	0.00E+00	1.75E+03	
7/1/1987	9.30E+00	7.75E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-9.30E+01	3.00E-06	0.00E+00	1.74E+03	
8/1/1987	8.37E+00	6.98E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-8.37E+01	1.00E-06	0.00E+00	1.74E+03	
9/1/1987	6.30E+00	5.25E-01	3.90E-01	3.25E-02	4.69E+00	2.14E-05	-5.91E+01	4.64E-07	0.00E+00	1.73E+03	
10/1/1987	4.34E+00	3.62E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-4.34E+01	2.63E-07	0.00E+00	1.73E+03	
11/1/1987	2.40E+00	2.00E-01	9.10E-01	7.58E-02	3.28E+00	1.05E-01	-1.50E+01	2.16E-07	0.00E+00	1.72E+03	
12/1/1987	1.55E+00	1.29E-01	1.69E+00	1.41E-01	2.81E+00	7.72E-01	6.28E-01	8.26E-01	0.00E+00	1.72E+03	
1/1/1988	1.55E+00	1.29E-01	2.60E+00	2.17E-01	2.81E+00	2.20E+00	8.30E+00	9.13E+00	0.00E+00	1.72E+03	
2/1/1988	2.52E+00	2.10E-01	2.09E+00	1.74E-01	2.35E+00	1.32E+00	-5.62E+00	7.46E+00	0.00E+00	1.72E+03	
3/1/1988	4.03E+00	3.36E-01	4.30E-01	3.58E-02	2.81E+00	6.16E-04	-3.60E+01	2.43E+00	0.00E+00	1.71E+03	
4/1/1988	5.70E+00	4,75E-01	1.38E+00	1.15E-01	3.28E+00	4.33E-01	-4.36E+01	9.35E-01	0.00E+00	1.71E+03	
5/1/1988	7.75E+00	6.46E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-7,75E+01	2.38E-01	0.00E+00	1.71E+03	
6/1/1988	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	6.22E-02	0.00E+00	1.70E+03	
7/1/1088	9 30E±00	7.75E-01	2 40E-01	2 00F-02	5.63E±00	0.0001+00	_9 06F±01	1 73E_02	0.0001+00	1.60E±03	
8/1/1000	8 37E+00	6.09E.01	7 00E 01	6 58E 02	5.63E+00	5 00E 00	_7 50E+01	6 20E 02	0.000-00	1.695+03	
0/1/1900	6.3/E+00	5 25E 01	3 20E-01	2.50E-02	4.60E+00	0.00E+02	-7.39E+01	2 80E 02	0.00E+00	1.69E+03	
10/1/1099	4 3/E+00	3.62E.01	0.00E+00	0.00E+00	4.220-00	0.000-00	_A 2/E+01	1 59E 02	0.000-00	1.685.02	
10/1/1968	+.J+E+00	5.04E-01	0.00E+00	0.00E+00	+.22E+00	0.00E+00	-+.34E+01	1.30E-03	0.00E+00	1.00E+03	

			INPUT			OUTPUT					
	Monthly	Monthly									
	Aug	Ava	Maan Draain	Maan Draain	Water		D (DET DO)	Soil	Daaharga	Storage	
Time	Avg.	Avg.	(in ab an)	(fast)	Demand	Runoff (in)	P-(PEI+KU)	Moisture	Kecharge	Storage	
	Kererence	Freeence	(inches)	(reet)	(AF)		(in)	(in)	(AF)	(AF)	
	E1 (Inches)	ET (leet)									
11/1/1988	2.40E+00	2.00E-01	4.70E-01	3.92E-02	3.28E+00	1.99E-03	-1.93E+01	1.23E-03	0.00E+00	1.68E+03	
12/1/1988	1.55E+00	1.29E-01	1.18E+00	9.83E-02	2.81E+00	2.63E-01	-3.96E+00	1.16E-03	0.00E+00	1.67E+03	
1/1/1989	1.55E+00	1.29E-01	5.90E-01	4.92E-02	2.81E+00	1.16E-02	-9.61E+00	1.03E-03	0.00E+00	1.67E+03	
2/1/1989	2.52E+00	2.10E-01	4.00E-02	3.33E-03	2.35E+00	0.00E+00	-2.48E+01	7.42E-04	0.00E+00	1.67E+03	
3/1/1989	4.03E+00	3.36E-01	0.00E+00	0.00E+00	2.81E+00	0.00E+00	-4.03E+01	4.39E-04	0.00E+00	1.67E+03	
4/1/1989	5.70E+00	4.75E-01	0.00E+00	0.00E+00	3.28E+00	0.00E+00	-5.70E+01	2.09E-04	0.00E+00	1.66E+03	
5/1/1989	7.75E+00	6.46E-01	1.20E-01	1.00E-02	4.22E+00	0.00E+00	-7.63E+01	7.76E-05	0.00E+00	1.66E+03	
6/1/1989	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	2.52E-05	0.00E+00	1.65E+03	
7/1/1989	9.30E+00	7.75E-01	3.50E-01	2.92E-02	5.63E+00	0.00E+00	-8.95E+01	7.91E-06	0.00E+00	1.65E+03	
8/1/1989	8.37E+00	6.98E-01	8.70E-01	7.25E-02	5.63E+00	8.82E-02	-7.51E+01	2.99E-06	0.00E+00	1.64E+03	
9/1/1989	6.30E+00	5.25E-01	0.00E+00	0.00E+00	4.69E+00	0.00E+00	-6.30E+01	1.33E-06	0.00E+00	1.64E+03	
10/1/1989	4.34E+00	3.62E-01	1.62E+00	1.35E-01	4.22E+00	6.89E-01	-2.79E+01	9.17E-07	0.00E+00	1.63E+03	
11/1/1989	2.40E+00	2.00E-01	8.00E-02	6.67E-03	3.28E+00	0.00E+00	-2.32E+01	6.80E-07	0.00E+00	1.63E+03	
12/1/1989	1.55E+00	1.29E-01	1.20E-01	1.00E-02	2.81E+00	0.00E+00	-1.43E+01	5.66E-07	0.00E+00	1.63E+03	
1/1/1990	1.55E+00	1.29E-01	1.82E+00	1.52E-01	2.81E+00	9.38E-01	1.76E+00	1.80E+00	0.00E+00	1.62E+03	
2/1/1990	2.52E+00	2.10E-01	7.10E-01	5.92E-02	2.35E+00	3.54E-02	-1.81E+01	9.29E-01	0.00E+00	1.62E+03	
3/1/1990	4.03E+00	3.36E-01	5.50E-01	4.58E-02	2.81E+00	7.02E-03	-3.48E+01	3.50E-01	0.00E+00	1.62E+03	
4/1/1990	5.70E+00	4.75E-01	7.50E-01	6.25E-02	3.28E+00	4.65E-02	-4.95E+01	1.20E-01	0.00E+00	1.62E+03	
5/1/1990	7.75E+00	6.46E-01	3.20E-01	2.67E-02	4.22E+00	0.00E+00	-7.43E+01	3.09E-02	0.00E+00	1.61E+03	
6/1/1990	8.70E+00	7.25E-01	2.76E+00	2.30E-01	5.16E+00	2.52E+00	-6.19E+01	1.12E-02	0.00E+00	1.61E+03	
7/1/1990	9.30E+00	7.75E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-9.30E+01	2.76E-03	0.00E+00	1.60E+03	
8/1/1990	8.37E+00	6.98E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-8.37E+01	8.41E-04	0.00E+00	1.60E+03	
9/1/1990	6.30E+00	5.25E-01	1.60E-01	1.33E-02	4.69E+00	0.00E+00	-6.14E+01	3.61E-04	0.00E+00	1.59E+03	
10/1/1990	4.34E+00	3.62E-01	1.60E-01	1.33E-02	4.22E+00	0.00E+00	-4.18E+01	2.04E-04	0.00E+00	1.59E+03	
11/1/1990	2.40E+00	2.00E-01	4.30E-01	3.58E-02	3.28E+00	6.16E-04	-1.97E+01	1.57E-04	0.00E+00	1.58E+03	
12/1/1990	1.55E+00	1.29E-01	5.90E-01	4.92E-02	2.81E+00	1.16E-02	-9.61E+00	1.38E-04	0.00E+00	1.58E+03	
1/1/1991	1.55E+00	1.29E-01	1.06E+00	8.83E-02	2.81E+00	1.81E-01	-5.08E+00	1.29E-04	0.00E+00	1.58E+03	
2/1/1991	2.52E+00	2.10E-01	3.23E+00	2.69E-01	2.35E+00	3.56E+00	3.54E+00	3.68E+00	0.00E+00	1.58E+03	
3/1/1991	4.03E+00	3.36E-01	5.91E+00	4.93E-01	2.81E+00	1.15E+01	7.26E+00	1.01E+01	1.38E+01	1.59E+03	
4/1/1991	5.70E+00	4.75E-01	0.00E+00	0.00E+00	3.28E+00	0.00E+00	-5.70E+01	8.64E+00	0.00E+00	1.58E+03	
5/1/1991	7.75E+00	6.46E-01	4.00E-02	3.33E-03	4.22E+00	0.00E+00	-7.71E+01	1.08E+00	0.00E+00	1.58E+03	
6/1/1991	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	1.77E-01	0.00E+00	1.57E+03	
7/1/1991	9.30E+00	7.75E-01	2.00E-01	1.67E-02	5.63E+00	0.00E+00	-9.10E+01	3.14E-02	0.00E+00	1.57E+03	
8/1/1991	8.37E+00	6.98E-01	3.20E-01	2.67E-02	5.63E+00	0.00E+00	-8.05E+01	7.79E-03	0.00E+00	1.56E+03	
9/1/1991	6.30E+00	5.25E-01	4.30E-01	3.58E-02	4.69E+00	6.16E-04	-5.87E+01	3.04E-03	0.00E+00	1.56E+03	
10/1/1991	4.34E+00	3.62E-01	4.30E-01	3.58E-02	4.22E+00	6.16E-04	-3.91E+01	1.67E-03	0.00E+00	1.55E+03	
11/1/1991	2.40E+00	2.00E-01	1.60E-01	1.33E-02	3.28E+00	0.00E+00	-2.24E+01	1.20E-03	0.00E+00	1.55E+03	
12/1/1991	1.55E+00	1.29E-01	2.36E+00	1.97E-01	2.81E+00	1.76E+00	6.34E+00	6.34E+00	0.00E+00	1.55E+03	
1/1/1992	1.55E+00	1.29E-01	1.85E+00	1.54E-01	2.81E+00	9.78E-01	2.02E+00	8.39E+00	1.14E-14	1.54E+03	
2/1/1992	2.52E+00	2.10E-01	3.31E+00	2.76E-01	2.35E+00	3.76E+00	4.14E+00	1.26E+01	8.81E+00	1.55E+03	
3/1/1992	4.03E+00	3.36E-01	4.73E+00	3.94E-01	2.81E+00	7.69E+00	-6.92E-01	2.48E+01	5.59E+01	1.60E+03	
4/1/1992	5.70E+00	4.75E-01	4.70E-01	3.92E-02	3.28E+00	1.99E-03	-5.23E+01	1.64E+01	0.00E+00	1.60E+03	
5/1/1992	7.75E+00	6.46E-01	6.30E-01	5.25E-02	4.22E+00	1.79E-02	-7.12E+01	3.06E+00	0.00E+00	1.60E+03	
6/1/1992	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	6.71E-01	0.00E+00	1.59E+03	
7/1/1992	9.30E+00	7.75E-01	7.50E-01	6.25E-02	5.63E+00	4.65E-02	-8.55E+01	1.80E-01	0.00E+00	1.59E+03	
8/1/1992	8.37E+00	6.98E-01	1.69E+00	1.41E-01	5.63E+00	7.72E-01	-6.76E+01	6.81E-02	0.00E+00	1.58E+03	
9/1/1992	6.30E+00	5.25E-01	0.00E+00	0.00E+00	4.69E+00	0.00E+00	-6.30E+01	2.83E-02	0.00E+00	1.58E+03	
10/1/1992	4.34E+00	3.62E-01	2.80E-01	2.33E-02	4.22E+00	0.00E+00	-4.06E+01	1.62E-02	0.00E+00	1.57E+03	
11/1/1992	2.40E+00	2.00E-01	8.00E-02	6.67E-03	3.28E+00	0.00E+00	-2.32E+01	1.18E-02	0.00E+00	1.57E+03	
12/1/1992	1.55E+00	1.29E-01	2.76E+00	2.30E-01	2.81E+00	2.52E+00	9.58E+00	9.59E+00	0.00E+00	1.56E+03	
1/1/1993	1.55E+00	1.29E-01	9.89E+00	8.24E-01	2.81E+00	2.6/E+01	5.6/E+01	3.28E+01	8.93E+02	1.94E+03	
2/1/1993	2.52E+00	2.10E-01	5.24E+00	4.5/E-01	2.35E+00	9.50E+00	1./9E+01	3.49E+01	4.11E+02	1.94E+03	
3/1/1993	4.03E+00	5.30E-01	7.90E-01	0.58E-02	2.81E+00	3.90E-02	-3.25E+01	5.29E+01	0.00E+00	1.93E+03	
4/1/1993	3.70E+00	4./3E-01	0.00E+00	0.00E+00	5.28E+00	0.00E+00	-5./0E+01	9.51E+00	0.00E+00	1.93E+03	
5/1/1993	/./JE+00	0.40E-01	2.00E-01	1.0/E-02	4.22E+00	0.00E+00	-/.55E+01	2.00E+00	0.00E+00	1.92E+03	
0/1/1993	0.20E+00	7.25E-01	2.00E-01	1.0/E-02	5.42E+00	0.00E+00	-8.50E+01	7.58E-01	0.00E+00	1.92E+03	
9/1/1993	9.30E+00	6.00E.01	0.00E+00	0.00E+00	5.62E+00	0.00E+00	-9.30E+01	2.11E-01 6.00E.02	0.00E+00	1.91E+03	
0/1/1993	6.3/E+00	5 25E 01	0.00E+00	0.00E+00	J.03E+00	0.00E+00	-0.3/E+01	3.02E-02	0.00E+00	1.91E+03	
10/1/1993	0.30E+00	3.62E-01	8 00E 02	6.67E.02	4.09E+00	0.00E+00	-0.30E+01	3.02E-02	0.00E+00	1.90E+03	
11/1/1993	+.34E+00	2 00E 01	1.30E+02	1 OVE-03	3.28E+00	3 60E 01	-4.20E+01	1.75E-02	0.002+00	1.900+03	
12/1/1002	1.55E+00	1 200 01	6 30E 01	5 25E 02	2.20E+00	1 70E 02	-1.14E+01	1 32E 02	0.0012+00	1.20E+03	
1/1/1993	1.55E+00	1.27E-01	1.02E+00	8 50E 02	2.01E+00	1.79E-02 1.58E-01	-7.22E+00	1.52E-02	0.0012+00	1.07E+03	
2/1/1004	2 52E+00	2 10E 01	3 70E+00	3 08E 01	2.01E+00	4.74E+00	7.0E+00	7.07E+00	0.0012+00	1.07E+03	
3/1/1994	2.52E+00 4.03E±00	2.10E-01 3.36E_01	2 32E±00	1.03E-01	2.55E+00 2.81E±00	4.74E+00	-1 88F±01	3.61E±00	0.00E+00	1.09E+03	
4/1/1004	5 70E±00	4 75E-01	7 50E-01	6.25E-01	3 28E±00	4.65E_02	-1.00L+01	9.45E_01	0.00E+00	1.89E±03	
5/1/1004	7 75E±00	6.46E-01	8.00E-01	6.67E_02	4 22E±00	0.00E±02	-7.67E±01	2 11E-01	0.005+00	1 88E±03	
6/1/1004	8 70E+00	7 25E 01	0.00E+02	0.07E-03	5 16E+00	0.00E+00	-7.07E+01	2.11E-01 4 00E 02	0.0012+00	1.00E+03	
7/1/1004	0.70E+00	7 75E 01	0.00±+00	0.00E+00	5.10E+00	0.00±+00	-0.70E+01	+.99E-02 1 25E 02	0.002+00	1.0/E+03	
8/1/1004	8 37E±00	6.98E_01	1.60E±00	1 41E_01	5.63E±00	7.72E_01	-9.30E+01	4.85E-02	0.00E+00	1.87E+03	
9/1/1994	6 30E±00	5.25E-01	3.00E_01	3.25E_02	4 60F±00	2 14E-01	-5.01F±01	2 16E-03	0.00E+00	1.86E±03	
10/1/1004	4 3/E±00	3.62E-01	4.00E-01	3 33E-02	4.09E+00	0.00E+00	-3.91E+01	1.21E-03	0.00E+00	1.85E±03	
11/1/1004	2.40F±00	2.00E-01	4 70E-02	3.92E-03	3.22E+00	1 99F-03	-+.50E+01	9.37E-03	0.00E+00	1.85E±03	
12/1/1004	1 55F±00	1 20F_01	1.65E±00	1 38E-01	2.81F±00	7.24E-01	2 76F_01	5.62E-04	0.005+00	1.85E±03	
1/1/1005	1.55E+00	1 20E 01	6.50E+00	5 42E 01	2.01E+00	1.24E=01	2.70E-01 3.50E+01	2.60E+01	2 88E+00	1 0/F+03	
2/1/1005	2 52E+00	2 10E 01	3 15E+00	2.62E.01	2.01E+00 2.35E+00	3 38E+01	2.39E+01	2.00E+01	2.00E+02 8 0/E+01	1.24E+03	
3/1/1995	2.52E+00 4.03E+00	2.10E-01	3.66E+00	2.05E-01 3.05E-01	2.33E+00	3.30E+00	2.92E+00 _8.24E+00	2.09E+01	0.942+01	1.940+03	
5/1/1995	4.03E+00	J.JUE-01	5.00E+00	5.05E-01	2.01E+00	4.04E+00	-0.34E+00	2.30E+01	0.006+00	1.736+03	

	INPUT					OUTPUT					
	Monthly	Monthly									
	Avg	Avg	Mean Precin	Mean Precin	Water		$P_{-}(PFT+RO)$	Soil	Recharge	Storage	
Time	Reference	Reference	(inches)	(feet)	Demand	Runoff (in)	(in)	Moisture	(AF)	(AF)	
	ET (inches)	FT (feet)	(inches)	(ieet)	(AF)		(111)	(in)	(AI)	(AI)	
	ET (menes)	ET (leet)									
4/1/1995	5.70E+00	4.75E-01	5.50E-01	4.58E-02	3.28E+00	7.02E-03	-5.15E+01	6.54E+00	0.00E+00	1.93E+03	
5/1/1995	7.75E+00	6.46E-01	7.90E-01	6.58E-02	4.22E+00	5.90E-02	-6.97E+01	1.82E+00	0.00E+00	1.92E+03	
6/1/1995	8.70E+00	7.25E-01	2.00E-01	1.67E-02	5.16E+00	0.00E+00	-8.50E+01	4.73E-01	0.00E+00	1.92E+03	
7/1/1995	9.30E+00	7.75E-01	4.00E-02	3.33E-03	5.63E+00	0.00E+00	-9.26E+01	1.25E-01	0.00E+00	1.91E+03	
8/1/1995	8.37E+00	6.98E-01	5.50E-01	4.58E-02	5.63E+00	7.02E-03	-7.82E+01	4.32E-02	0.00E+00	1.91E+03	
9/1/1995	6.30E+00	5.25E-01	4.70E-01	3.92E-02	4.69E+00	1.99E-03	-5.83E+01	1.99E-02	0.00E+00	1.90E+03	
10/1/1995	4.34E+00	3.62E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-4.34E+01	1.13E-02	0.00E+00	1.90E+03	
11/1/1995	2.40E+00	2.00E-01	0.00E+00	0.00E+00	3.28E+00	0.00E+00	-2.40E+01	8.22E-03	0.00E+00	1.90E+03	
12/1/1995	1.55E+00	1.29E-01	2.80E-01	2.33E-02	2.81E+00	0.00E+00	-1.27E+01	6.97E-03	0.00E+00	1.89E+03	
1/1/1996	1.55E+00	1.29E-01	1.18E+00	9.83E-02	2.81E+00	2.63E-01	-3.96E+00	6.59E-03	0.00E+00	1.89E+03	
2/1/1996	2.52E+00	2.10E-01	5.16E+00	4.30E-01	2.35E+00	9.05E+00	1.74E+01	1.58E+01	2.10E+01	1.91E+03	
3/1/1996	4.03E+00	3.36E-01	1.58E+00	1.32E-01	2.81E+00	6.43E-01	-2.51E+01	9.28E+00	0.00E+00	1.91E+03	
4/1/1996	5.70E+00	4.75E-01	8.00E-02	6.67E-03	3.28E+00	0.00E+00	-5.62E+01	1.93E+00	0.00E+00	1.90E+03	
5/1/1996	7.75E+00	6.46E-01	1.60E-01	1.33E-02	4.22E+00	0.00E+00	-7.59E+01	4.88E-01	0.00E+00	1.90E+03	
0/1/1996	8.70E+00	7.23E-01	0.00E+00	0.00E+00	5.62E+00	0.00E+00	-8.70E+01	1.28E-01	0.00E+00	1.89E+03	
2/1/1996	9.30E+00	6.08E.01	4.00E-02	3.33E-03	5.63E+00	0.00E+00	-9.20E+01	3.40E-02	0.00E+00	1.89E+03	
0/1/1990	6.37E+00	5.25E.01	1.60E-01	1.22E.02	3.03E+00	0.00E+00	-0.5/E+01	1.12E-02	0.00E+00	1.00E+03	
10/1/1006	4 34E±00	3.62E-01	8 70E-01	7.25E-02	4.09E+00	8.82E_02	-0.14E+01	+.90E-03	0.00E+00	1.00E+03	
11/1/1006	2.40F±00	2.00E_01	8 70E-01	7.25E-02	3.22E+00	8.82E-02	-3.+6L+01	2.57E_02	0.00E+00	1.87E±03	
12/1/1006	1 55F+00	1 29F_01	1 42F+00	1 18F-01	2.81F+00	4 72F-01	-1 77F+00	2.57E-03	0.00E+00	1.87E+03	
1/1/1007	1.55E+00	1 29E-01	3.58F+00	2 98F-01	2.81E+00	4.43F+00	1 59F+01	1.50F+01	1.16F+01	1.88F+03	
2/1/1997	2.52E+00	2.10E-01	1.02E+00	8.50E-02	2.35E+00	1.58E-01	-1.52E+01	1.06E+01	0.00E+00	1.87E+03	
3/1/1997	4.03E+00	3.36E-01	4.00E-02	3.33E-03	2.81E+00	0.00E+00	-3.99E+01	3.17E+00	0.00E+00	1.87E+03	
4/1/1997	5.70E+00	4.75E-01	4.30E-01	3.58E-02	3.28E+00	6.16E-04	-5.27E+01	1.10E+00	0.00E+00	1.87E+03	
5/1/1997	7.75E+00	6.46E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-7.75E+01	3.05E-01	0.00E+00	1.86E+03	
6/1/1997	8.70E+00	7.25E-01	5.50E-01	4.58E-02	5.16E+00	7.02E-03	-8.15E+01	9.19E-02	0.00E+00	1.86E+03	
7/1/1997	9.30E+00	7.75E-01	8.00E-02	6.67E-03	5.63E+00	0.00E+00	-9.22E+01	2.58E-02	0.00E+00	1.85E+03	
8/1/1997	8.37E+00	6.98E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-8.37E+01	8.49E-03	0.00E+00	1.85E+03	
9/1/1997	6.30E+00	5.25E-01	1.97E+00	1.64E-01	4.69E+00	1.14E+00	-4.44E+01	4.68E-03	0.00E+00	1.84E+03	
10/1/1997	4.34E+00	3.62E-01	8.00E-02	6.67E-03	4.22E+00	0.00E+00	-4.26E+01	2.68E-03	0.00E+00	1.84E+03	
11/1/1997	2.40E+00	2.00E-01	1.38E+00	1.15E-01	3.28E+00	4.33E-01	-1.06E+01	2.32E-03	0.00E+00	1.83E+03	
12/1/1997	1.55E+00	1.29E-01	2.68E+00	2.23E-01	2.81E+00	2.36E+00	8.94E+00	8.94E+00	0.00E+00	1.83E+03	
1/1/1998	1.55E+00	1.29E-01	1.42E+00	1.18E-01	2.81E+00	4.72E-01	-1.77E+00	8.38E+00	0.00E+00	1.83E+03	
2/1/1998	2.52E+00	2.10E-01	7.76E+00	6.47E-01	2.35E+00	1.83E+01	3.41E+01	2.81E+01	4.32E+02	1.94E+03	
3/1/1998	4.03E+00	3.36E-01	3.66E+00	3.05E-01	2.81E+00	4.64E+00	-8.34E+00	2.95E+01	0.00E+00	1.93E+03	
4/1/1998	5.70E+00	4.75E-01	1.69E+00	1.41E-01	3.28E+00	7.72E-01	-4.09E+01	1.10E+01	0.00E+00	1.93E+03	
5/1/1998	7.75E+00	6.46E-01	1.30E+00	1.08E-01	4.22E+00	3.60E-01	-6.49E+01	3.49E+00	0.00E+00	1.92E+03	
6/1/1998	8.70E+00	7.25E-01	4.00E-02	3.33E-03	5.16E+00	0.00E+00	-8.66E+01	9.23E-01	0.00E+00	1.92E+03	
7/1/1998	9.30E+00	7.75E-01	8.00E-02	6.6/E-03	5.63E+00	0.00E+00	-9.22E+01	2.51E-01	0.00E+00	1.91E+03	
8/1/1998	8.37E+00	6.98E-01	1.65E+00	1.38E-01	5.63E+00	7.24E-01	-6.79E+01	9.94E-02	0.00E+00	1.91E+03	
9/1/1998	6.30E+00	5.25E-01	3.20E-01	2.6/E-02	4.69E+00	0.00E+00	-5.98E+01	4.4/E-02	0.00E+00	1.90E+03	
10/1/1998	4.34E+00	3.62E-01	4.00E-02	3.33E-03	4.22E+00	0.00E+00	-4.30E+01	2.53E-02	0.00E+00	1.90E+03	
12/1/1998	2.40E+00	2.00E-01	1.38E+00	1.13E-01	3.28E+00	4.33E-01	-1.06E+01	2.19E-02	0.00E+00	1.90E+03	
1/1/1998	1.55E+00	1.29E-01	1.42E+00	1.18E-01	2.81E+00	4.72E-01	-1.//E+00	2.14E-02	0.00E+00	1.89E+03	
2/1/1000	2.52E+00	2 10E 01	8 70E 01	7.25E.02	2.81E+00	8.82E.02	-5.45E-01	7.33E.02	0.00E+00	1.89E+03	
3/1/1999	2.32E+00	3.36E-01	7.10E-01	5.92E-02	2.33E+00	3.54E-02	-3.32E+01	2 72E-02	0.00E+00	1.89E+03	
4/1/1999	5,70E+00	4.75E-01	1.73E+00	1.44E-01	3.28E+00	8.22E-01	-4.05E+01	1.15E-02	0.00E+00	1.88E+03	
5/1/1999	7,75E+00	6.46E-01	2.00E-01	1.67E-02	4,22E+00	0,00E+00	-7.55E+01	3.19E-03	0.00E+00	1.88E+03	
6/1/1999	8.70E+00	7.25E-01	3.20E-01	2.67E-02	5.16E+00	0.00E+00	-8.38E+01	9.16E-04	0.00E+00	1.87E+03	
7/1/1999	9.30E+00	7.75E-01	8.70E-01	7.25E-02	5.63E+00	8.82E-02	-8.44E+01	2.82E-04	0.00E+00	1.87E+03	
8/1/1999	8.37E+00	6.98E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-8.37E+01	9.13E-05	0.00E+00	1.86E+03	
9/1/1999	6.30E+00	5.25E-01	8.00E-02	6.67E-03	4.69E+00	0.00E+00	-6.22E+01	4.01E-05	0.00E+00	1.86E+03	
10/1/1999	4.34E+00	3.62E-01	2.00E-01	1.67E-02	4.22E+00	0.00E+00	-4.14E+01	2.32E-05	0.00E+00	1.85E+03	
11/1/1999	2.40E+00	2.00E-01	4.00E-02	3.33E-03	3.28E+00	0.00E+00	-2.36E+01	1.70E-05	0.00E+00	1.85E+03	
12/1/1999	1.55E+00	1.29E-01	2.00E-01	1.67E-02	2.81E+00	0.00E+00	-1.35E+01	1.43E-05	0.00E+00	1.85E+03	
1/1/2000	1.55E+00	1.29E-01	7.10E-01	5.92E-02	2.81E+00	3.54E-02	-8.44E+00	1.28E-05	0.00E+00	1.84E+03	
2/1/2000	2.52E+00	2.10E-01	3.58E+00	2.98E-01	2.35E+00	4.43E+00	6.17E+00	6.17E+00	0.00E+00	1.84E+03	
3/1/2000	4.03E+00	3.36E-01	1.14E+00	9.50E-02	2.81E+00	2.34E-01	-2.91E+01	2.19E+00	0.00E+00	1.84E+03	
4/1/2000	5.70E+00	4.75E-01	5.50E-01	4.58E-02	3.28E+00	7.02E-03	-5.15E+01	6.10E-01	0.00E+00	1.84E+03	
5/1/2000	7.75E+00	6.46E-01	4.00E-02	3.33E-03	4.22E+00	0.00E+00	-7.71E+01	1.39E-01	0.00E+00	1.83E+03	
6/1/2000	8.70E+00	7.25E-01	2.80E-01	2.33E-02	5.16E+00	0.00E+00	-8.42E+01	3.46E-02	0.00E+00	1.83E+03	
//1/2000	9.30E+00	7.75E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-9.30E+01	8.63E-03	0.00E+00	1.82E+03	
8/1/2000	8.3/E+00	0.98E-01	7.90E-01	0.58E-02	5.63E+00	5.90E-02	-/.59E+01	2.97E-03	0.00E+00	1.81E+03	
9/1/2000	0.30E+00	5.25E-01	1.60E-01	1.33E-02	4.69E+00	0.00E+00	-0.14E+01	1.28E-03	0.00E+00	1.81E+03	
10/1/2000	4.54E+00	3.02E-01	0./UE-UI	3.38E-02	4.22E+00	2.39E-02	-3.0/E+01	7.81E-04	0.00E+00	1.81E+03	
12/1/2000	2.40E+00	2.00E-01	2.80E-01 8.00E.02	2.33E-02	2.28E+00	0.00E+00	-2.12E+01	J.08E-04	0.00E+00	1.80E+03	
1/1/2000	1.53E+00	1.29E-01	0.00E-02	1 /1E 01	2.01E+00	7 70E 01	-1.4/E+01	4.03E-04	0.00E+00	1.00E+03	
2/1/2001	2 52E+00	2 10E 01	2.56E+00	2 13E 01	2.01E+00	2 12E+01	_1 72E+00	0.20E-01	0.00E+00	1.00E+03	
3/1/2001	4.03F±00	3 36E-01	8 70F-01	7.25E-01	2.33E+00	8.82E-02	_3 17E±01	3.11E-01	0.000-00	1.79E+03	
4/1/2001	5.70F+00	4 75F_01	1.02F+00	8 50F-02	3.28F+00	1 58F-01	-4 70F+01	9.64F_02	0.00E+00	1.79E+03	
5/1/2001	7.75F+00	6.46F_01	0.00F+00	0.00F+00	4.22E+00	0.00F+00	-7 75F+01	2.09F_02	0.00E+00	1.78F+03	
6/1/2001	8,70E+00	7.25E-01	0.00E+00	0.00E+00	5.16F+00	0.00E+00	-8.70E+01	4.75E-03	0.00E+00	1.78E+03	
7/1/2001	9,30E+00	7.75E-01	4.00E-02	3.33E-03	5.63E+00	0.00E+00	-9.26E+01	1.16E-03	0.00E+00	1.77E+03	
8/1/2001	8.37E+00	6.98E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-8.37E+01	3.50E-04	0.00E+00	1.77E+03	

	INPUT					OUTPUT				
	Monthly	Monthly								
	Avg	Avg	Mean Precin	Mean Precin	Water		$P_{*}(PFT+RO)$	Soil	Recharge	Storage
Time	Reference	Reference	(inches)	(feet)	Demand	Runoff (in)	(in)	Moisture	(AF)	(AF)
	ET (inches)	ET (feet)	(inches)	(reet)	(AF)		(11)	(in)	(/11)	(/11)
	ET (menes)									
9/1/2001	6.30E+00	5.25E-01	2.44E+00	2.03E-01	4.69E+00	1.90E+00	-4.05E+01	2.00E-04	0.00E+00	1.76E+03
10/1/2001	4.34E+00	3.62E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-4.34E+01	1.10E-04	0.00E+00	1.76E+03
11/1/2001	2.40E+00	2.00E-01	5.90E-01	4.92E-02	3.28E+00	1.16E-02	-1.81E+01	8.61E-05	0.00E+00	1.76E+03
12/1/2001	1.55E+00	1.29E-01	1.10E+00	9.17E-02	2.81E+00	2.06E-01	-4.71E+00	8.10E-05	0.00E+00	1.75E+03
1/1/2002	1.55E+00	1.29E-01	3.20E-01	2.67E-02	2.81E+00	0.00E+00	-1.23E+01	6.85E-05	0.00E+00	1.75E+03
2/1/2002	2.52E+00	2.10E-01	1.60E-01	1.33E-02	2.35E+00	0.00E+00	-2.36E+01	4.98E-05	0.00E+00	1.75E+03
3/1/2002	4.03E+00	3.36E-01	6.70E-01	5.58E-02	2.81E+00	2.59E-02	-3.36E+01	3.16E-05	0.00E+00	1.74E+03
5/1/2002	3.70E+00	4./3E-01	4.50E-01	5.38E-02	3.28E+00	0.10E-04	-3.2/E+01	1.30E-03	0.00E+00	1.74E+03
6/1/2002	8 70E+00	7.25E.01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-7.73E+01 8 70E+01	1.73E.06	0.00E+00	1.74E+03
7/1/2002	9 30E+00	7.25E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-9.30E+01	4 99E-07	0.00E+00	1.73E+03
8/1/2002	8 37E+00	6 98E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-8 37E+01	1.63E-07	0.00E+00	1.72E+03
9/1/2002	6.30E+00	5.25E-01	9.50E-01	7.92E-02	4.69E+00	1.22E-01	-5.36E+01	8.01E-08	0.00E+00	1.72E+03
10/1/2002	4.34E+00	3.62E-01	1.60E-01	1.33E-02	4.22E+00	0.00E+00	-4.18E+01	4.59E-08	0.00E+00	1.71E+03
11/1/2002	2.40E+00	2.00E-01	1.46E+00	1.22E-01	3.28E+00	5.13E-01	-9.91E+00	4.03E-08	0.00E+00	1.71E+03
12/1/2002	1.55E+00	1.29E-01	1.38E+00	1.15E-01	2.81E+00	4.33E-01	-2.13E+00	3.93E-08	0.00E+00	1.71E+03
1/1/2003	1.55E+00	1.29E-01	1.60E-01	1.33E-02	2.81E+00	0.00E+00	-1.39E+01	3.27E-08	0.00E+00	1.70E+03
2/1/2003	2.52E+00	2.10E-01	3.62E+00	3.02E-01	2.35E+00	4.53E+00	6.47E+00	6.47E+00	0.00E+00	1.70E+03
3/1/2003	4.03E+00	3.30E-01	1.42E+00	1.18E-01	2.81E+00	4.72E-01	-2.00E+01	2.30E+00	0.00E+00	1.70E+03
5/1/2003	7 75F±00	6.46E-01	8 30E-01	6.92E-01	4.20E+00	7 20E-01	-4.20E+01	2.11F_01	0.00E+00	1.09E+03
6/1/2003	8,70E+00	7.25E-01	0.00E+00	0.00E+00	5,16E+00	0,00E+00	-8.70E+01	4.84E-02	0.00E+00	1.69E+03
7/1/2003	9.30E+00	7.75E-01	2.00E-01	1.67E-02	5.63E+00	0.00E+00	-9.10E+01	1.22E-02	0.00E+00	1.68E+03
8/1/2003	8.37E+00	6.98E-01	1.93E+00	1.61E-01	5.63E+00	1.09E+00	-6.55E+01	4.82E-03	0.00E+00	1.67E+03
9/1/2003	6.30E+00	5.25E-01	4.00E-02	3.33E-03	4.69E+00	0.00E+00	-6.26E+01	2.03E-03	0.00E+00	1.67E+03
10/1/2003	4.34E+00	3.62E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-4.34E+01	1.13E-03	0.00E+00	1.66E+03
11/1/2003	2.40E+00	2.00E-01	5.50E-01	4.58E-02	3.28E+00	7.02E-03	-1.85E+01	8.81E-04	0.00E+00	1.66E+03
12/1/2003	1.55E+00	1.29E-01	1.50E+00	1.25E-01	2.81E+00	5.55E-01	-1.05E+00	8.68E-04	0.00E+00	1.66E+03
1/1/2004	1.55E+00	1.29E-01	5.90E-01	4.92E-02	2.81E+00	1.16E-02	-9.61E+00	7.63E-04	0.00E+00	1.66E+03
2/1/2004	2.52E+00	2.10E-01 3.36E-01	3.00E+00	3.05E-01	2.35E+00	4.64E+00	0.76E+00 2.55E+01	0.70E+00	0.00E+00	1.65E+03
4/1/2004	5 70E+00	4 75E-01	6.60E-01	5 50E-02	3.28E+00	2.37E-02	-5.04E+01	7 53E-01	0.00E+00	1.65E+03
5/1/2004	7.75E+00	6.46E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-7.75E+01	1.70E-01	0.00E+00	1.64E+03
6/1/2004	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	4.08E-02	0.00E+00	1.64E+03
7/1/2004	9.30E+00	7.75E-01	2.40E-01	2.00E-02	5.63E+00	0.00E+00	-9.06E+01	1.06E-02	0.00E+00	1.63E+03
8/1/2004	8.37E+00	6.98E-01	5.10E-01	4.25E-02	5.63E+00	4.09E-03	-7.86E+01	3.54E-03	0.00E+00	1.63E+03
9/1/2004	6.30E+00	5.25E-01	4.00E-02	3.33E-03	4.69E+00	0.00E+00	-6.26E+01	1.51E-03	0.00E+00	1.62E+03
10/1/2004	4.34E+00	3.62E-01	6.58E+00	5.48E-01	4.22E+00	1.39E+01	8.50E+00	8.51E+00	1.63E+00	1.62E+03
11/1/2004	2.40E+00	2.00E-01	6.70E-01	5.58E-02	3.28E+00	2.59E-02	-1.73E+01	6.43E+00	0.00E+00	1.62E+03
12/1/2004	1.55E+00	1.29E-01	4.14E+00	3.45E-01	2.81E+00	5.95E+00	2.00E+01	2.06E+01	1.38E+02	1.75E+03
2/1/2005	2.52E+00	2 10E 01	3.33E+00	2.90E-01	2.81E+00	4.33E+00	1.50E+01	2.73E+01	2.69E+02	1.94E+03
3/1/2005	2.32E+00	3.36E-01	4.18E+00	8 50F-02	2.33E+00	1.58F-01	-3.03E+01	2.93E+01 3.09E+01	0.00E+00	1.94E+03
4/1/2005	5.70E+00	4.75E-01	3.90E-01	3.25E-02	3.28E+00	2.14E-05	-5.31E+01	8.95E+00	0.00E+00	1.93E+03
5/1/2005	7.75E+00	6.46E-01	4.00E-02	3.33E-03	4.22E+00	0.00E+00	-7.71E+01	2.35E+00	0.00E+00	1.92E+03
6/1/2005	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	6.26E-01	0.00E+00	1.92E+03
7/1/2005	9.30E+00	7.75E-01	5.50E-01	4.58E-02	5.63E+00	7.02E-03	-8.75E+01	1.82E-01	0.00E+00	1.91E+03
8/1/2005	8.37E+00	6.98E-01	3.19E+00	2.66E-01	5.63E+00	3.47E+00	-5.53E+01	8.45E-02	0.00E+00	1.91E+03
9/1/2005	6.30E+00	5.25E-01	8.00E-02	6.67E-03	4.69E+00	0.00E+00	-6.22E+01	3.67E-02	0.00E+00	1.90E+03
10/1/2005	4.34E+00	3.62E-01	5.90E-01	4.92E-02	4.22E+00	1.16E-02	-3.75E+01	2.23E-02	0.00E+00	1.90E+03
11/1/2005	2.40E+00	2.00E-01	4.00E-02	3.33E-03	3.28E+00	0.00E+00	-2.36E+01	1.63E-02	0.00E+00	1.90E+03
1/1/2005	1.55E+00	1.29E-01	5 10F-01	4 25E-02	2.81E+00	4 09F-03	-1.45E+01	1.55E-02	0.00E+00	1.89E+03
2/1/2006	2.52E+00	2.10E-01	1.06E+00	8.83E-02	2.35E+00	1.81E-01	-1.48E+01	9.65E-03	0.00E+00	1.89E+03
3/1/2006	4.03E+00	3.36E-01	2.64E+00	2.20E-01	2.81E+00	2.28E+00	-1.62E+01	7.70E-03	0.00E+00	1.89E+03
4/1/2006	5.70E+00	4.75E-01	1.73E+00	1.44E-01	3.28E+00	8.22E-01	-4.05E+01	4.50E-03	0.00E+00	1.88E+03
5/1/2006	7.75E+00	6.46E-01	8.00E-02	6.67E-03	4.22E+00	0.00E+00	-7.67E+01	1.64E-03	0.00E+00	1.88E+03
6/1/2006	8.70E+00	7.25E-01	1.60E-01	1.33E-02	5.16E+00	0.00E+00	-8.54E+01	5.35E-04	0.00E+00	1.87E+03
7/1/2006	9.30E+00	7.75E-01	3.50E-01	2.92E-02	5.63E+00	0.00E+00	-8.95E+01	1.66E-04	0.00E+00	1.87E+03
8/1/2006	8.37E+00	6.98E-01	8.00E-02	6.67E-03	5.63E+00	0.00E+00	-8.29E+01	5.61E-05	0.00E+00	1.86E+03
9/1/2006	6.30E+00	3.25E-01	4.00E-02	3.33E-03	4.69E+00	0.00E+00	-6.26E+01	2.47E-05	0.00E+00	1.86E+03
10/1/2006	4.34E+00	2.02E-01	2.40E-01 8.00E.02	2.00E-02	4.22E+00	0.00E+00	-4.10E+01	1.45E-05	0.00E+00	1.85E+03
12/1/2006	1.55E+00	1.29E-01	7.90E-02	6.58E-02	2.81E+00	5.90E-02	-2.52E+01	9.67E-06	0.00E+00	1.85E+03
1/1/2007	1.55E+00	1.29E-01	3.50E-01	2.92E-02	2.81E+00	0.00E+00	-1.20E+01	8.27E-06	0.00E+00	1.84E+03
2/1/2007	2.52E+00	2.10E-01	1.30E+00	1.08E-01	2.35E+00	3.60E-01	-1.26E+01	7.00E-06	0.00E+00	1.84E+03
3/1/2007	4.03E+00	3.36E-01	3.90E-01	3.25E-02	2.81E+00	2.14E-05	-3.64E+01	4.35E-06	0.00E+00	1.84E+03
4/1/2007	5.70E+00	4.75E-01	3.20E-01	2.67E-02	3.28E+00	0.00E+00	-5.38E+01	2.16E-06	0.00E+00	1.84E+03
5/1/2007	7.75E+00	6.46E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-7.75E+01	7.86E-07	0.00E+00	1.83E+03
6/1/2007	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	2.53E-07	0.00E+00	1.83E+03
2//1/2007	9.30E+00	7.75E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-9.30E+01	7.56E-08	0.00E+00	1.82E+03
8/1/2007	δ.3/E+00 6.30E+00	5.98E-01	0.00E+00	0.00E+00 1.33E-02	3.03E+00	0.00E+00	-8.3/E+01	2.55E-08	0.00E+00	1.81E+03
10/1/2007	4 34E+00	3.43E-01	1.00E-01	1.33E-02 1.33E-02	4.09E+00	0.00E+00	-0.14E+01	6.60E.00	0.00E+00	1.01E+03
11/1/2007	2.40F+00	2 00F-01	1.65F+00	1 38F-01	3.28F+00	7 24F_01	-8.22F+00	5 96F-09	0.00E+00	1.80F+03
12/1/2007	1.55E+00	1.29E-01	7.90E-01	6.58E-02	2.81E+00	5.90E-02	-7.66E+00	5.39E-09	0.00E+00	1.80E+03
1/1/2008	1.55E+00	1.29E-01	4.32E+00	3.60E-01	2.81E+00	6.46E+00	2.12E+01	1.87E+01	3.78E+01	1.83E+03

			INPUT			OUTPUT				
Time	Monthly Avg. Reference ET (inches)	Monthly Avg. Reference ET (feet)	Mean Precip (inches)	Mean Precip (feet)	Water Demand (AF)	Runoff (in)	P-(PET+RO) (in)	Soil Moisture (in)	Recharge (AF)	Storage (AF)
2/1/2008	2.52E+00	2.10E-01	2.09E+00	1.74E-01	2.35E+00	1.32E+00	-5.62E+00	1.77E+01	0.00E+00	1.83E+03
3/1/2008	4.03E+00	3.36E-01	3.20E-01	2.67E-02	2.81E+00	0.00E+00	-3.71E+01	5.60E+00	0.00E+00	1.83E+03
4/1/2008	5.70E+00	4.75E-01	0.00E+00	0.00E+00	3.28E+00	0.00E+00	-5.70E+01	1.70E+00	0.00E+00	1.83E+03
5/1/2008	7.75E+00	6.46E-01	2.00E-01	1.67E-02	4.22E+00	0.00E+00	-7.55E+01	4.80E-01	0.00E+00	1.82E+03
6/1/2008	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	1.32E-01	0.00E+00	1.82E+03
7/1/2008	9 30E+00	7 75E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-9 30E+01	3.66E-02	0.00E+00	1.81E+03
8/1/2008	8 37E+00	6 98E-01	2 40E-01	2.00E-02	5.63E+00	0.00E+00	-8 13E+01	1 24E-02	0.00E+00	1.81E+03
9/1/2008	6.30E+00	5.25E-01	6.30E-01	5.25E-02	4.69E+00	1.79E-02	-5.67E+01	5.89E-03	0.00E+00	1.80E+03
10/1/2008	4 34E+00	3.62E-01	4 00E-02	3 33E-03	4 22E+00	0.00E+00	-4 30E+01	3 36E-03	0.00E+00	1 80E+03
11/1/2008	2.40E+00	2.00E-01	1 38E+00	1 15E-01	3 28E+00	4 33E-01	-1.06E+01	2.91E-03	0.00E+00	1 79E+03
12/1/2008	1 55E+00	1 29E-01	5 39E+00	4 49E-01	2.81E+00	9 79E+00	2.86E+01	2.22E+01	1 58E+02	1.94E+03
1/1/2009	1.55E+00	1 29E-01	8 00E-02	6.67E-03	2.81E+00	0.00E+00	-1 47E+01	1.88E+01	0.00E+00	1.93E+03
2/1/2009	2 52E+00	2 10E-01	2 56E+00	2 13E-01	2 35E+00	2.12E+00	-1.72E+00	1.79E+01	3.82E+00	1.93E+03
3/1/2009	4.03E+00	3.36E-01	0.00E+00	0.00E+00	2.83E+00	0.00E+00	-4.03E±01	1.04E+01	0.00E+00	1.93E+03
4/1/2009	5 70E+00	4 75E-01	1.60E-01	1.33E-02	3.28E+00	0.00E+00	-5 54E+01	2.14E+00	0.00E+00	1.93E+03
5/1/2009	7.75E+00	6.46E-01	0.00E+00	0.00E±00	4.22E+00	0.00E+00	-7.75E+01	5 31E-01	0.00E+00	1.93E+03
6/1/2009	8 70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8 70E+01	1.46E-01	0.00E+00	1.92E+03
7/1/2009	9 30E+00	7 75E-01	3 20E-01	2.67E-02	5.63E+00	0.00E+00	-8 98E+01	4 28E-02	0.00E+00	1.91E+03
8/1/2009	8 37E+00	6 98E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-8 37E+01	1 41E-02	0.00E+00	1.91E+03
9/1/2009	6 30E+00	5 25E-01	0.00E+00	0.00E+00	4 69E+00	0.00E+00	-6 30E+01	6 19E-03	0.00E+00	1.90E+03
10/1/2009	4.34E+00	3.62E-01	4.00E-02	3.33E-03	4.22E+00	0.00E+00	-4.30E+01	3.54E-03	0.00E+00	1.90E+03
11/1/2009	2.40E+00	2.00E-01	4.30E-01	3.58E-02	3.28E+00	6.16E-04	-1.97E+01	2.74E-03	0.00E+00	1.89E+03
12/1/2009	1.55E+00	1.29E-01	3.31E+00	2.76E-01	2.81E+00	3.76E+00	1.38E+01	1.35E+01	5.19E+00	1.90E+03
1/1/2010	1.55E+00	1.29E-01	5.75E+00	4.79E-01	2.81E+00	1.10E+01	3.10E+01	2.89E+01	4.52E+02	1.94E+03
2/1/2010	2.52E+00	2.10E-01	2.76E+00	2.30E-01	2.35E+00	2.52E+00	-1.20E-01	2.88E+01	3.50E+01	1.94E+03
3/1/2010	4.03E+00	3.36E-01	1.18E+00	9.83E-02	2.81E+00	2.63E-01	-2.88E+01	1.98E+01	0.00E+00	1.93E+03
4/1/2010	5.70E+00	4.75E-01	1.46E+00	1.22E-01	3.28E+00	5.13E-01	-4.29E+01	6.85E+00	0.00E+00	1.93E+03
5/1/2010	7.75E+00	6.46E-01	0.00E+00	0.00E+00	4.22E+00	0.00E+00	-7.75E+01	1.63E+00	0.00E+00	1.92E+03
6/1/2010	8.70E+00	7.25E-01	0.00E+00	0.00E+00	5.16E+00	0.00E+00	-8.70E+01	4.15E-01	0.00E+00	1.92E+03
7/1/2010	9.30E+00	7.75E-01	4.00E-02	3.33E-03	5.63E+00	0.00E+00	-9.26E+01	1.11E-01	0.00E+00	1.91E+03
8/1/2010	8.37E+00	6.98E-01	0.00E+00	0.00E+00	5.63E+00	0.00E+00	-8.37E+01	3.57E-02	0.00E+00	1.91E+03
9/1/2010	6.30E+00	5.25E-01	0.00E+00	0.00E+00	4.69E+00	0.00E+00	-6.30E+01	1.55E-02	0.00E+00	1.90E+03
10/1/2010	4.34E+00	3.62E-01	4.10E+00	3.42E-01	4.22E+00	5.83E+00	-8.23E+00	1.34E-02	0.00E+00	1.90E+03
11/1/2010	2.40E+00	2.00E-01	8.30E-01	6.92E-02	3.28E+00	7.29E-02	-1.58E+01	1.09E-02	0.00E+00	1.90E+03
12/1/2010	1.55E+00	1.29E-01	4.10E+00	3.42E-01	2.81E+00	5.83E+00	1.97E+01	1.79E+01	2.39E+01	1.92E+03
1/1/2011	1.55E+00	1.29E-01	4.70E-01	3.92E-02	2.81E+00	1.99E-03	-1.08E+01	1.52E+01	0.00E+00	1.91E+03
2/1/2011	2.52E+00	2.10E-01	4.52E+00	3.77E-01	2.35E+00	7.06E+00	1.29E+01	2.22E+01	1.41E+02	1.94E+03
3/1/2011	4.03E+00	3.36E-01	1.65E+00	1.38E-01	2.81E+00	7.24E-01	-2.45E+01	1.71E+01	0.00E+00	1.93E+03
4/1/2011	5.70E+00	4.75E-01	2.40E-01	2.00E-02	3.28E+00	0.00E+00	-5.46E+01	3.57E+00	0.00E+00	1.93E+03
5/1/2011	7.75E+00	6.46E-01	7.10E-01	5.92E-02	4.22E+00	3.54E-02	-7.04E+01	9.70E-01	0.00E+00	1.92E+03
6/1/2011	8.70E+00	7.25E-01	1.60E-01	1.33E-02	5.16E+00	0.00E+00	-8.54E+01	2.59E-01	0.00E+00	1.92E+03
7/1/2011	9.30E+00	7.75E-01	5.50E-01	4.58E-02	5.63E+00	7.02E-03	-8.75E+01	7.52E-02	0.00E+00	1.91E+03
8/1/2011	8.37E+00	6.98E-01	3.40E-01	2.83E-02	5.63E+00	0.00E+00	-8.03E+01	2.54E-02	0.00E+00	1.91E+03
9/1/2011	6.30E+00	5.25E-01	0.00E+00	0.00E+00	4.69E+00	0.00E+00	-6.30E+01	1.11E-02	0.00E+00	1.90E+03
10/1/2011	4.34E+00	3.62E-01	5.00E-01	4.17E-02	4.22E+00	3.50E-03	-3.84E+01	6.69E-03	0.00E+00	1.90E+03
11/1/2011	2.40E+00	2.00E-01	2.71E+00	2.26E-01	3.28E+00	2.42E+00	6.82E-01	1.38E+00	0.00E+00	1.90E+03
12/1/2011	1.55E+00	1.29E-01	1.95E+00	1.63E-01	2.81E+00	1.11E+00	2.89E+00	4.2/E+00	0.00E+00	1.89E+03
1/1/2012	1.55E+00	1.29E-01	1.70E-01	0.42E-02	2.81E+00	5.26E-02	-/.85E+00	3.11E+00	0.00E+00	1.89E+03
2/1/2012	2.52E+00	2.10E-01	1.20E+00	1.05E-01	2.35E+00	3.20E-01	-1.29E+01	1.9/E+00	0.00E+00	1.89E+03
3/1/2012	4.03E+00	3.30E-01	1.8/E+00	1.30E-01	2.81E+00	0.72E-01	-2.20E+01	1.02E+00	0.00E+00	1.89E+03
4/1/2012	3.70E+00	4.73E-01	1.//E+00	1.48E-01	3.28E+00	0.00E+00	-4.02E+01	3.99E-01	0.00E+00	1.86E+03
6/1/2012	8 70E+00	7.25E.01	0.00E+00	0.00E+00	+.22E+00	0.00E+00	-7.73E+01	9.02E-02	0.00E+00	1.00E+03
0/1/2012	0./UE+00	1.23E-01	0.00E+00	0.00E+00	J.10E+00	0.00E+00	-0./UE+UI	2.14E-02	0.00E+00	1.0/E+03

# APPENDIX D

# Draft Outline of Source Capacity Study

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#### **APPENDIX D – SOURCE CAPACITY STUDY REPORT DRAFT OUTLINE**

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#### **APPENDIX D – SOURCE CAPACITY STUDY REPORT DRAFT OUTLINE**

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APPENDICES (order will be determined by reference in report) Appendix A. Tabulated Water Level Monitoring Data by Well Appendix B. Digital Copy of Data and Analyses Appendix C. Additional Appendices as needed