CH2MHILL

DOCKET
07-AFC-5
DATE May 27 2009
RECD. May 27 2009

CH2M HILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833
Tel 916-920-0300
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May 27, 2009
File No.: 04.02.16.02
Project No. 357891

Mr. John Kessler, Project Manager
California Energy Commission
Systems Assessment and Facilities Siting Division
1516 9th Street, MS 15
Sacramento, CA 95814-5504

RE: Data Response, Set 1K
Ivanpah Solar Electric Generating System (07-AFC-5)

Dear Mr. Kessler:

On behalf of Solar Partners I, LLC, Solar Partners II, LLC, Solar Partners IV, LLC, and Solar Partners VIII, LLC (Applicant), please find attached one original and four hard copies, plus five CD copies of Data Response, Set 1K.

Please call me if you have any questions.

Sincerely,

CH2M HILL

John Carrier

John L. Carrier, J.D.
Program Manager

Enclosure
c: POS List
Project File

Ivanpah Solar Electric Generating System (ISEGS)

(07-AFC-5)

Data Response, Set 1K

(Response to Data Request: Biological Resources and Waste Management)

Submitted to the

California Energy Commission

Submitted by

Solar Partners I, LLC; Solar Partners II, LLC; Solar Partners IV, LLC; and Solar Partners VIII, LLC

May 27, 2009

With Assistance from

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

Introduction

Attached are Solar Partners I, LLC, Solar Partners II, LLC, Solar Partners IV, LLC, and Solar Partners VIII, LLC (Applicant) response to the California Energy Commission (CEC) Staff's data request numbers 19, 79 and 111 for the Ivanpah Solar Electric Generating System (Ivanpah SEGS) Project (07-AFC-5). The CEC Staff served these data requests on December 12, 2007, as part of the discovery process for Ivanpah SEGS. The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as CEC Staff presented them and are keyed to the Data Request numbers (1 through 116). New graphics or tables are numbered in reference to the Data Request number. For example, the first attachment used in response to Data Request 19 would be numbered Table DR19-1A.

The Applicant looks forward to working cooperatively with the CEC and BLM staff as the Ivanpah SEGS Project proceeds through the siting process. We trust that these responses address the Staff's questions and remain available to have any additional dialogue the Staff may require.

Biological Resources (19)

Background

AFC Table 5.2-15 provides an overview of permits required for biological resources and indicates that the process for each requires approximately six to nine months. The AFC also refers to informal consultation with staff members at agencies regarding the project and potential biological issues of concern. However, staff could not find any documentation on the dates, personnel, and content of communications with the California Department of Fish and Game (CDFG), U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), or U.S. Fish and Wildlife Service (USFWS) regarding sensitive biological resources, such as the federally threatened desert tortoise, jurisdictional waters, and permitting requirements. In addition, a USFWS-approved Biological Assessment (BA) with agreed upon mitigation needs to be provided so the Preliminary and Final Staff Assessments can be completed.

Data Request

19. For jurisdictional waters, please provide expected impact acreages as well as mitigation ratios and acreages for the Clean Water Act section 401 and 404 permits and CDFG Streambed Alteration Agreement, as appropriate.

Response: A wetland delineation report was submitted to the USACE in February, 2008; it was revised per comments received from Shannon Pankratz and resubmitted in September, 2008 as Attachment DR19-1B. Since then the USACE has indicated that it will not assert jurisdiction. The Preliminary Jurisdictional Determination form is provided as Attachment DR19-1C. Once the USACE finalizes all jurisdictional determinations for the project and issues a no-permit-required letter, a copy will be filed with the CEC and the Parties.

It is anticipated that a Streambed Alteration Agreement application will be filed with CDFG within the next 2 weeks.

ATTACHMENT DR19-1C

Preliminary Jurisdictional Determination

ATTACHMENT DR19-1C

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): May 15, 2009

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:
Steve DeYoung
Bright Source Energy
1999 Harrison Street, Suite 2150
Oakland, California 94612

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Los Angeles District; Ivanpah Valley Solar Energy Project; SPL-2007-415-SLP

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: (USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)

State:CA County/parish/borough: San Bernardino City: near Calada
Center coordinates of site (lat/long in degree decimal format):
Lat. 35.557958° N, Long. -115.470354° **W.**

Universal Transverse Mercator:

Name of nearest waterbody: Ivanpah Lake

Identify (estimate) amount of waters in the review area:

Non-wetland waters: linear feet: width (ft) and/or 22399-acres.

Cowardin Class: Lacustrine
Stream Flow: NA
Wetlands: NA acres.
Cowardin Class: NA

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal: NA
Non-Tidal: NA

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date: May 15, 2009

☐ Field Determination. Date(s):

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable. This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:CH2MHill 2007 Wetland Delineation (Revised 2008).

☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

- ☐ Office concurs with data sheets/delineation report.
- ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps: .

☐ Corps navigable waters' study: .

☐ U.S. Geological Survey Hydrologic Atlas: .

- ☐ USGS NHD data.
- ☐ USGS 8 and 12 digit HUC maps.

☒ U.S. Geological Survey map(s). Cite scale & quad name:Ivanpah Lake, Clark Mountain.

☒ USDA Natural Resources Conservation Service Soil Survey. Citation:NRCS 2007 (http://websoilsurvey.nrcs.usda.gov/).

☐ National wetlands inventory map(s). Cite name: .

☐ State/Local wetland inventory map(s): .

☐ FEMA/FIRM maps: .

☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☒ Photographs: ☒ Aerial (Name & Date):Project Aerial Photo 2007; Google Earth aerial.

or ☐ Other (Name & Date): .

☒ Previous determination(s). File no. and date of response letter:SPL-2007-886-GS, December 20, 2007; SPL-2000-1678-AJS, March 30, 2001.

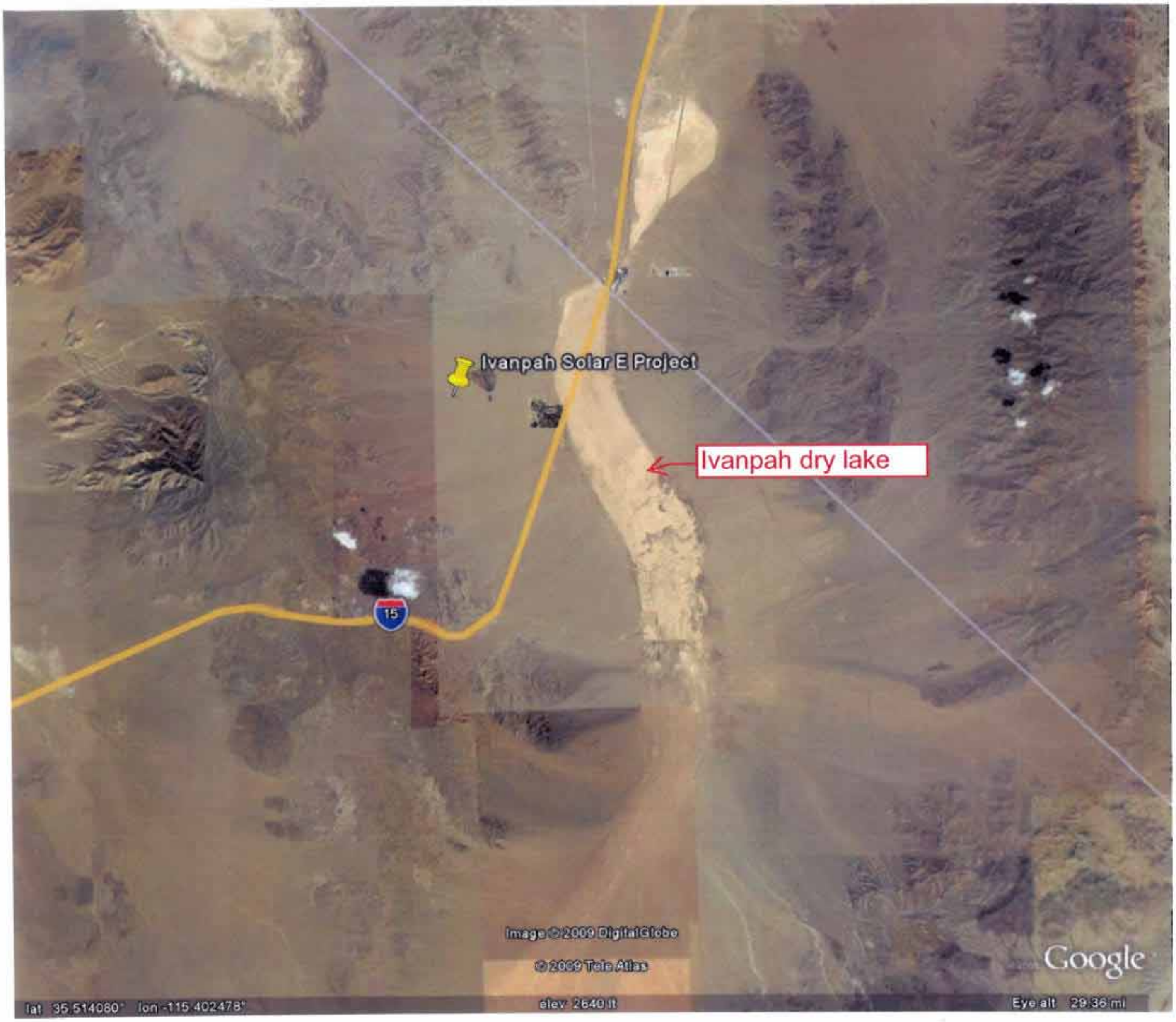
☒ Other information (please specify):CA Groundwater Bulletin #118: Ivanpah Valley Groundwater Basin; BLM Ivanpah Dry Lake information (http://www.blm.gov/ca/st/en/fo/needles/ivanpah.html; BLM Stipulations for Ivanpah Dry Lake FY 2008; National Parks Conservation Association, "Variety and Adventure in the California Desert: A Guide to Responsible Recreation".

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of
Regulatory Project Manager
(REQUIRED)

5/18/09
Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining
the signature is impracticable)

Site number	**Latitude**	**Longitude**	**Cowardin Class**	**Estimated amount of aquatic resource in review area**	**Class of aquatic resource**
Ivanpah Lake	35.557958° N	-115.470354° **W**	Lacustrine (dry lake)	22399-acres	non-section 10 – non-wetland


Ivanpah Solar E Project
Ivanpah dry lake
15
Image © 2009 DigitalGlobe
© 2009 Tele Atlas
Google
lat 35.514080° lon -115.402478°
elev 2640 ft
Eye alt 29.36 mi

Soils and Water Resources (79)

Background

A letter, dated October 25, 2007 by the RWQCB, states that,

"The proposal to pump an additional 100 acre-feet per year of groundwater from the eastern edge of the Ivanpah Valley could adversely affect groundwater quality. The additional groundwater withdrawal may create a pumping depression at the edge of the Valley where the quality of groundwater is good. This may cause poorer quality groundwater in the center of the Valley to migrate to the pumping depression where the quality of groundwater is higher. At the center of the Valley, there is both naturally-occurring poor quality groundwater and groundwater whose quality has deteriorated further due to percolation of wastewater from waste disposal ponds to groundwater. The ponds are owned by Molycorp, Inc."

Data Request

79. Please provide a detailed discussion regarding potential degradation of water quality due to the creation of a pumping depression at the edge of the Ivanpah Valley. This discussion should include an explanation of why poorer quality groundwater from the center of the valley will not migrate to the area of higher groundwater quality at the edge of the valley. This explanation may require further groundwater modeling.

Response: Technical Memorandum No. 9 provides an assessment of potential groundwater quality impacts from the proposed Ivanpah SEGS project. It is provided as Attachment DR79-1A.

ATTACHMENT DR79-1A

Assessment of Potential Groundwater Quality Impacts

WEST YOST ASSOCIATES
Consulting Engineers

ATTACHMENT DR79-1A

REGISTERED PROFESSIONAL ENGINEER
TIMOTHY J. DURBIN
No. C 20651
Exp. 9/30/09
CIVIL
STATE OF CALIFORNIA
5/26/09

TECHNICAL MEMORANDUM NO. 9

DATE: May 26, 2009 — Project No.: 351-00-08-01

TO: BrightSource Energy, Inc.

FROM: Kenneth Loy, P.G. #7008
Timothy J. Durbin, R.C.E. #20651

SUBJECT: Assessment of Potential Groundwater Quality Impacts from the Proposed Ivanpah SEGS

This technical memorandum (TM) provides an assessment of the potential groundwater quality impacts associated with groundwater pumping to serve the water supply requirements of the proposed Ivanpah Solar Electric Generating System (ISEGS). This TM provides a summary of the relevant background information on the ISEGS, followed by a discussion of the available groundwater level and quality monitoring results. This is followed by an assessment of incremental changes in groundwater levels that may occur in the future as the result of groundwater pumping to serve the water needs of the ISEGS and the nearby Primm Valley Golf Club. This TM addresses the potential for intrusion of brackish or saline groundwater existing naturally at depth in the groundwater basin, and the potential for mobilization of anthropogenic contaminants from the Molycorp disposal pond.

The TM concludes that chloride is a good indicator of intrusion of saline groundwater for the ISEGS and vicinity. Historical trends in chloride concentrations in the active production wells are stable or slightly increasing. The slight increases appear to be caused by increases in production of individual wells. Effects appear to be limited to the specific well with the increased production rate and do not appear to indicate a widespread intrusion of saline water. Modeling of three dimensional groundwater flow over a 65-year period indicates that the projected groundwater pumping from the Primm Valley Golf Club and the ISEGS will not significantly increase the lateral or vertical components of flow relative to current conditions in the aquifer.

Particle tracking over a 65-year period, including 15 years of golf course pumping followed by 50 years of golf course and ISEGS pumping, indicates that transport of any anthropogenic contaminants from the Molycorp disposal pond induced by the ISEGS pumping would be at or below the limits of measurement.

BACKGROUND

BrightSource Energy, Inc. proposes to construct the 400-megawatt ISEGS in Ivanpah Valley, California (Figure 1). The proposed ISEGS is located in the eastern Mojave Desert approximately 1.6 miles west of the Ivanpah Dry Lake and 4.5 miles southwest of Primm, Nevada, in San Bernardino County, California (Figure 2). The project site will be located on federal property managed by the U.S. Bureau of Land Management (BLM). The ISEGS will consist of three powerplants known as Ivanpah 1, Ivanpah 2, and Ivanpah 3. The system will consist of heliostat arrays that focus solar radiation on boilers atop individual power towers. The ISEGS site is about 4,000 acres in area, and most of that area will be occupied by the heliostat arrays. The three ISEGS powerplants will have a combined net rating of approximately 400 megawatts. The ISEGS will be constructed in three phases: Ivanpah 1 (nominal 100 megawatts), Ivanpah 2 (nominal 100 megawatts), and Ivanpah 3 (nominal 200 megawatts).

Description of Study Area

Ivanpah Valley is located on the California-Nevada border, about 40 miles southwest of Las Vegas (Figure 1). The valley covers about 560,000 acres, including 340,000 acres within California and 220,000 acres within Nevada, including Jean Lake Valley. This TM addresses the California, or southern, part of Ivanpah Valley. The Nevada part of Ivanpah Valley and Jean Lake Valley are referred to as north Ivanpah Valley. The proposed Ivanpah SEGS is located in the western portion of south Ivanpah Valley (Figure 1).

Ivanpah Valley is a topographically closed basin within which surface-water drainage evaporates on either the Ivanpah Lake or Roach Lake playas. The basin is a northward trending physiographic feature bordered by the Bird Spring Range on the north, the Sheep Mountains, Lucy Grey Range, and New York Mountains on the east and by the Spring Mountains, Clark Mountain Range, and Ivanpah Mountains on the west and by a low topographic divide between Ivanpah Valley and Shadow Valley. Topographic altitudes range from about 2,600 ft on the playas to about 7,200 ft within the eastern mountains and 8,500 ft within the western mountains.

Several communities, two active mines, and a powerplant are located within Ivanpah Valley. The principal communities are Jean and Primm. Jean is located within Nevada and consists mostly of several small casinos, a correctional facility, and a small number of residences. Primm is located on the California-Nevada border, and consists mostly of several small casinos and a residential complex. A golf course, known as Primm Valley Golf Club, is located near Primm within California. The Molycorp mine, which includes an open-pit mine and milling facility, is located within California on the southwestern border of Ivanpah Valley. The Colosseum mine, which is an underground mine, is located within California on the western border of Ivanpah Valley. The Reliant Bighorn powerplant is located in Nevada near Primm. All together, the existing cultural features within Ivanpah Valley occupy less than one percent of the land area.

Water Supply Requirements

The Ivanpah ISEGS will require the construction and operation of a water-supply well and backup well, both of which would be located within south Ivanpah Valley. The water-supply requirement for the Ivanpah ISEGS (all 400 megawatts) will not exceed 100 acre-feet per year (afy), and all the pumped water will be consumed, i.e., the project will have no significant return flows to the groundwater basin. Pumping will continue for the 50-year life of the power plant. Figure 2 shows the assumed location for the main ISEGS supply well, which is designated PW-1. Figure 2 also shows the location of the Primm Valley Golf Club. The water supply for the Primm Valley Golf Club is primarily derived from wells Colosseum 1 and Colosseum 2 (Figure 2). The ISEGS well screen will most likely be within the interval 300 to 400 ft below the groundwater table, which roughly corresponds to the well-screen placement for the golf-course wells. The water demand for Ivanpah ISEGS is based on the assumption that the groundwater quality (principally total dissolved solids [TDS]) at the proposed well location will be similar to the groundwater quality at the Colosseum wells. Nevertheless, the actual groundwater quality at the proposed wells is expected to be better, because groundwater quality tends to improve (lower total dissolved solids) toward the margins of Ivanpah Valley (ENSR Corporation, 2007, p. 10-7) and because the proposed wells will be closer to the margins of the valley than the Colosseum wells.

The current and projected future water demand at the Primm Valley Golf Club is approximately 1,660 afy. Beginning in late 1998, most of this production has been from the Colosseum wells.

Hydrogeology

The primary aquifer in the Ivanpah Valley is comprised of unconsolidated alluvial sediments of Pliocene and Pleistocene age. These alluvial sediments are bounded by fault-block mountains comprised of rocks units ranging from pre-Cambrian to Tertiary age (Hewett, 1956; Plume, 1996; Harrill and Prudic, 1998). The carbonate rocks include limestone and dolomite of pre-Cambrian and Paleozoic age. They occur within the Spring Mountains, Bird Spring Range, and Sheep Mountain on the northwestern and northeastern boarders of Ivanpah Valley. The intrusive rocks are mostly granitic rocks of pre-Cambrian and Tertiary ages. They occur within the McCullough Range, New York Mountains, Clark Mountain Range, and Ivanpah Mountains on the southeastern and southwestern borders. The extrusive rocks are mostly basaltic rocks of Tertiary and Quaternary age. These rocks occur within the McCullough Range on the western border of Jean Lake Valley.

The hydraulic properties of the consolidated rocks vary greatly among the rock types (Plume, 1996; Harrill and Prudic, 1998). The carbonate rocks are the most permeable at large spatial scales. While the carbonate-rock matrix is poorly permeable, fault- and fold-induced fracture permeability is significant. Groundwater underflow can occur through carbonate-rock mountain ranges, where supporting hydraulic gradients exist. The granitic and basaltic rocks are poorly permeable at large scales. While those rocks are fractured, poor fracture connectivity and small apertures at depth limit the ability to transmit water. Correspondingly, no groundwater underflow occurs through the non-carbonate-rock mountain ranges, and those ranges act as barriers to underflow.

The unconsolidated deposits consist of alluvial and playa deposits of Pliocene to Holocene ages (Hewett, 1956; Plume, 1996). An older alluvium, which represents alluvial-fan deposits of Pliocene and early Pleistocene ages, is composed of gravel, sand, and silt with some boulders and clay. This unit underlies the valley-floor areas within both Ivanpah Valley and Jean Lake Valley. The older alluvium is generally below the regional groundwater table, and produces good yields to production wells. The younger alluvium, which represents alluvial-fan deposits of late Pleistocene and Holocene ages, is composed of gravel and sand with some silt and clay. The younger alluvium is generally above the regional groundwater table, and only perched groundwater occurs. The playa deposits, which represent pluvial deposits of Holocene age, are composed of fine sand, silt, and clay. The playa deposits are above the regional groundwater table, and only perched groundwater occurs.

HISTORICAL GROUNDWATER LEVEL AND QUALITY TRENDS

The report entitled, "Ground-Water Monitoring Ten-Year Report, July 10, 1998 to July 10, 2008" provides detailed groundwater level and quality monitoring for wells at the Primm Valley Golf Club and vicinity (Broadbent & Associates, 2009). Figure 2 shows the locations of the wells included in the report. Table 1 provides a summary of relevant construction, usage and groundwater quality information from Broadbent & Associates (2009).

Table 1. Well Construction, Usage and Groundwater Quality, Primm Valley Golf Club

Well Name	Primary Use	Annual Production, 2008, acre-feet	Approximate Elevations of Screen, feet msl	TDS, July 2008, mg/L	Water Type
PVGC 7	Backup	28.92	2,000-2,340	1300	Na-Cl
PVGC 8	Backup	43.61	2,090-2,330	940	Na-Cl
PVGC 9	Backup	2.43	2,217-2,380	720	Na-Cl
Colosseum 1	Production	1,012.5	2,230-2,500	450	Na-$HC0_3$
Colosseum 2	Production	560.19	2,120-2,450	301	Na-$HC0_3$
M13	Monitoring	NA	Not surveyed	340	Na-$HC0_3$
M14	Monitoring	NA	Not surveyed	330	Na-$HC0_3$
Stateline	Monitoring	NA	Unknown	Not measured	Not measured
Yates	Monitoring	NA	Unknown	Not measured	Not measured
Total		1,647.64			

Data from Broadbent & Associates (2009)

Wells PVGC 7, PVGC 8, and PVGC 9 were the primary supply wells for the golf course until late July 1998. The owner of the golf course, PRMA Land Development Company, acquired the Colosseum wells from the Colosseum mine operation, and these well became the primary supply for the golf course in late July 1998 (Broadbent & Associates, 2009). The Colosseum wells had been inactive since approximately 1993. Based on the production records, full utilization of the Colosseum wells at current rates of total production began in the 2001-2002 timeframe. Initially, in the 1998-2001 timeframe, Colosseum 1 had the largest production. Between late 2001 and early 2006, production in the two Colosseum wells was roughly equal. In late 2006 through early 2008 Colosseum 1 again had the largest production.

Monitoring wells M13 and M14 were drilled to provide monitoring of the golf course production, pursuant to the San Bernardino conditions of approval (Broadbent & Associates, 2009). The wells were completed in April 2003 and March 2004, respectively, and monitoring data are limited. Well head elevations are not available for M13 and M14.

The Stateline and Yates wells are stock wells owned by the BLM. The Stateline well is approximately 120 feet deep, and the Yates well is approximately 300 feet deep. The screened intervals of the wells are not documented in Broadbent & Associates (2009). Groundwater elevation measurements are documented, but groundwater quality results are not (Broadbent & Associates, 2009).

Groundwater Level Trends

Groundwater levels are measured throughout the year for wells listed in Table 1. The measurements made in December of each year are made after the wells are turned off and groundwater levels have recovered (Broadbent & Associates, 2009). Figure 3 shows the trends in the annual December groundwater elevations for the period 1999 though 2007 in relation to annual precipitation for wells Colosseum 1, Colosseum 2, Stateline and Yates. The groundwater elevation trends exhibit no significant correlation with precipitation. The groundwater elevation in Collosseum 1 declined by approximately six feet between 2000 and 2007. The groundwater elevation Colosseum 2 declined by approximately 15 feet between 2000 and 2001 and has been stable since 2001. Groundwater elevations in the Stateline and Yates wells declined by less than five feet over the same period. The lower groundwater elevations in the Colosseum wells with respect to the Stateline and Yates wells indicates that groundwater levels had not fully recovered in the Colosseum wells by December of each year.

Groundwater Quality Trends

Table 1 lists the elevations of the screened intervals of the wells, the TDS concentration and the general water quality type measured at each well. Figure 2 shows the well locations. Figure 4 illustrates spatial trends in groundwater quality for the July 2008 sampling event (Broadbent & Associates, 2009). The wells fall in two categories based on measured water type and TDS concentration. The wells closest to the playa, PVGC 7, PVGC 8, and PVGC 9 are characterized by sodium (Na) – chloride (Cl) type water and TDS concentrations greater than 500 milligrams per liter (mg/L). The wells located to the west on the alluvial fan, the Colosseum wells, MW13 and MW14, are characterized by Na – bicarbonate (HCO_3) type water and TDS concentrations less than 500 mg/L.

Figure 4 shows the percentages of the major cations and anions comprising the TDS in each well, and reinforces the relationship between water type and TDS. Specifically, for the wells with Na-Cl type water quality, the percentage of Cl and, to a lesser extent, Na increases with increasing well depth. This is accompanied by an increase in TDS. The shallowest well in this category, PVGC 9, has intermediate water quality falling between the wells near the playa and on the alluvial fan.

Although the percentages of Na are highest near the playa, Na is not as good an indicator of changes in groundwater quality over time as Cl, because high percentages of sodium occur in both the Na-Cl and Na-HCO_3 water types. For example, MW13 has the third highest percentage of Na, falling below only PCGC 7 and PCGC 8 (Figure 4). This is despite the fact that MW13 is in the Na-HCO_3 water type category and has low TDS (Table 1).

Samples from monitoring well MW13 are representative of the Na-HCO_3 water type with no mixing with the Na-Cl water type, because the well is located relatively high on the alluvial fan, upgradient of the pumping wells (Figure 2). The similarity of the water quality and TDS in MW13, MW14 and Colosseum 2 demonstrates that groundwater quality in the vicinity of these wells is unaffected by saline water intrusion.

Table 1 and Figure 4 demonstrate that Colosseum 1 is also of the Na-HCO_3 water type but is affected by limited mixing with Na-Cl type water, based on a slightly elevated percentage of Cl and the TDS concentration. The production and construction information in Table 1 shows that Colosseum 1 has the highest production and is the deepest of the wells in the Na-HCO_3 category. The high level of production in this well and the deeper screened intervals, relative to Colosseum 2, may result in the capture of Na-Cl type water from depth. This capture appears to be limited to Colosseum 1, because wells in the vicinity, MW14 and Colosseum 2, are not affected (Table 1, Figure 2 and Figure 4).

Appendix A contains graphs of the historical Na and Cl concentrations measured in the wells. The graph for Colosseum 1 shows a slightly increasing trend in Na and Cl concentrations that may account for the relatively elevated TDS measured in the well (Table 1 and Figure A-4).

Even though Colosseum 1 appears to be capturing Na-Cl type water at depth, there is evidence that Na-HCO_3 type water is displacing Na-Cl type water in the vicinity of the ISEGS and golf course. As discussed above, M14 and Colosseum 2 have Na-HCO_3 water quality that is very similar to the background water quality in M13. The shallowest of the golf course wells has water quality intermediate between the wells near the playa and the wells on the alluvial fan. Also, the Na and Cl concentrations in PCGC 7, the well with the highest TDS, have declined since the late 1990s, when the PCGC series wells were last used as the primary supply source.

GROUNDWATER FLOW SIMULATIONS

Groundwater flow simulations were conducted to assess the potential incremental changes in groundwater flow velocities caused by pumping to meet the water supply requirements of the Primm Valley Golf Club and the proposed ISEGS. Figure 2 shows the locations of the production and monitoring wells used in the simulations. Golf course pumping was simulated using a hypothetical well designated GC-1 located approximately at the site of Colosseum 1. The well designated PW-1 on Figure 2 was used to simulate the ISEGS pumping. Simulated groundwater levels were assessed at hypothetical monitoring well locations MW-1 through MW-7 (Figure 2). Each of the seven monitoring well locations shown on Figure 2 represents a series of simulated monitoring wells measuring groundwater levels at one hundred foot increments to the base of the aquifer.

Simulations were conducted using WTAQ (Barlow and Moench, 1999) and MODFLOW (McDonald and Harbaugh, 1988; Harbaugh and McDonald, 1996; and Harbaugh, et. al., 2000). Particle tracking was conducted using MODPATH (Pollock, 1989).

WTAQ is a computer program that implements the analytical solution for drawdown due to pumping from a partially penetrating well in a homogenous, anisotropic aquifer. The program provides drawdown results at discrete points in time and space and was used in this effort to prepare simulated hydrographs of the drawdown induced by the golf course and ISEGS pumping. Simulated hydrographs were generated for hypothetical monitoring wells MW-1 through MW-7 (Figure 2).

MODFLOW is a widely used, thoroughly tested and well documented finite difference program developed by the United States Geological Survey. MODFLOW implements an approximate finite difference solution to the groundwater flow equation and was implemented using the Groundwater Vistas interface. MODFLOW was used to develop simulated contours of drawdown in plan and cross section view. The cross section views also show flow velocity vectors. This information was used to assess potential changes in groundwater flow velocities due to the proposed ISEGS pumping.

MODPATH is a particle tracking post-processing package that was developed to compute three-dimensional flowpaths using output from steady-state or transient ground-water flow simulations by MODFLOW. MODPATH was used to assess the potential for pumping-induced transport of anthropogenic contaminants from the Molycorp disposal pond (Figure 2).

Table 2 lists the parameters used in the simulations. The input parameters include horizontal hydraulic conductivity, vertical hydraulic conductivity, specific storage, specific yield, aquifer-system thickness, and well-screen. The hydraulic parameters were derived from those used in the groundwater model developed by ENSR Corporation (2007, Figure 9-5 and p. 9-4), except for the specific yield. The specific yield used in the ENSR Corporation model appears to be implausibly small, thus a specific yield of 0.05 was used in the drawdown calculation (Durbin, 2007).

Table 2. Model Parameters

Parameter	Value	Units
Horizontal hydraulic conductivity	2	feet per day
Vertical hydraulic conductivity	0.2	feet per day
Specific storage	0.0001	1/feet
Specific yield	0.05	unitless
Aquifer thickness	1,000	feet
Depth to screen top	300	feet
Depth to screen bottom	400	feet
ISEGS pumping rate, well PW-1	100	acre-feet per year
	11,900	cubic feet per day
Primm Valley Golf Club pumping rate, well GC-1	1,660	acre-feet per year
	198,108	cubic feet per day

WTAQ Simulations

The WTAQ results were prepared using a superposition approach. A baseline simulation was performed with pumping only in golf course well GC-1. The GC-1 simulation was run for a period of 65 years. A second simulation was performed with pumping only in ISEGS well PW-1. The PW-1 simulation was run for a period of 50 years. Both simulations used the parameters listed in Table 2.

The results of the two simulations were then superimposed, assuming that the golf course pumping had been conducted for 15 years prior to the start of the ISEGS pumping.

Figure 6 shows the simulated drawdown hydrographs for distances of 0.5 mile, one mile and two miles from PW-1. After 50 years of ISEGS pumping, the incremental increase in drawdowns were:

- 0.5 mile: 2.1 feet
- One mile: 1.4 feet
- Two miles: 0.8 feet

These results are consistent with previous modeling of the ISEGS water requirements (Durbin, 2007).

Appendix B contains additional hydrographs simulated using WTAQ. The hydrographs show that at distances of several hundred feet and greater from the ISEGS pumping well, PW-1, there are no difference in drawdown with depth in the aquifer. Therefore, the ISEGS pumping does not affect vertical flow gradients at distances greater than several hundred feet from the pumping well. Because the ISEGS pumping well is located in an area with Na-HCO_3 type water, the WTAQ results indicate that the ISEGS pumping will not have measurable effects on the movement of saline water.

MODFLOW Simulations

MODFLOW simulations were developed using the same parameters and pumping schedules used in the WTAQ model. The model was constructed with 134 rows, 132 columns, grid spacing ranging from 500 feet in the area of interest to 2,250 feet in outer areas, and 20 layers. Constant head boundary conditions were used for consistency with the WTAQ model. The model was run in transient mode, with two stress periods accommodating the pumping schedules of the golf course and ISEGS wells.

Figure 6 shows the simulated hydrographs prepared to validate the MODFLOW model with respect to the analytical solution implemented in WTAQ. As shown in the figure the MODFLOW and WTAQ simulations match very closely, except near the pumping wells, where the grid spacing of the MODFLOW model limits the accuracy of the drawdown results.

Figure 7 shows the simulated drawdown under the baseline condition after 65 years of pumping in the golf course well. This time period is equivalent to the 50th year of the life of the proposed ISEGS, because the golf course production began approximately 15 years before the proposed SEGS is planned to begin. Under the baseline scenario, drawdown of 10 feet had propagated to a radial distance of approximately 2.9 miles from the center of golf course pumping.

Figure 8 shows the simulated drawdown that would occur after 50 years of ISEGS pumping (the life of the project). Under this scenario, drawdown of one foot had propagated to a radial distance of approximately 1.6 miles from the center of the ISEGS pumping.

Figure 9 shows the simulated drawdown under the future project scenario, which includes 15 years of pumping of the golf course well, followed by 50 years of pumping of the golf course and ISEGS wells. Under the future project scenario, drawdown of 10 feet had propagated to a radial distance of approximately 3.0 miles from the center of golf course pumping. The drawdown is nearly indistinguishable from the baseline scenario, except in the immediate vicinity of the ISEGS pumping well.

Figures 10 through Figure 12 show simulated drawdown contours and flow velocity vectors in cross section view for the three scenarios just described. Figure 10 demonstrates that the golf course pumping has limited effect on vertical flow velocities, except in the vicinity of the well. Figure 11 shows that the pumping in the proposed ISEGS well has even less effect on vertical flow. Figure 12, which shows the proposed project conditions with both the ISEGS and golf course wells pumping is nearly indistinguishable from Figure 10, the baseline conditions cross section.

These simulation results are consistent with the findings of the water quality analysis, which indicated that capture of Na-Cl type water under current pumping conditions is limited to the well Colosseum 1.

MODPATH Particle Tracking

Figure 9 shows the results of the MODPATH particle tracking. Fifty particles were released along a line oriented approximately perpendicular to the groundwater flow direction at the Molycorp disposal pond. The particles were moved according to the prevailing simulated groundwater gradients for the 65 years modeled in the proposed project scenario. This included 15 years of pumping in the golf course well followed by 50 years of pumping in the golf course and ISEGS wells. The particles moved approximately 200 feet. A similar result was obtained using Darcy's Law, the hydraulic conductivity listed in Table 2, a hydraulic gradient of 0.001 and a porosity of 0.2. Comparison of Figures 7 through 9 shows that only a very small fraction of the total drawdown at the Molycorp disposal pond is attributable to the proposed ISEGS pumping. Therefore, it is unlikely that the proposed ISEGS pumping will have a measurable effect on contaminant mobility at the Molycorp disposal pond.

CONCLUSIONS

Chloride is a good indicator of intrusion of saline groundwater for the ISEGS and vicinity. Historical trends in chloride concentrations in the active production wells are stable or slightly increasing. The slight increases appear to be caused by increases in production of individual wells, specifically golf course well Coliseum 1. The effects appear to be limited to Colosseum 1 because of the well's relatively high production rate and its depth. Modeling of three dimensional groundwater flow over a 65-year period indicates that the projected groundwater pumping from the Primm Valley Golf Club and the ISEGS will not significantly increase the lateral or vertical components of flow relative to current conditions in the aquifer.

Because the ISEGS well will pump only about six percent of the volume that is pumped by the golf course, and the ISEGS well will be located farther up the alluvial fan than the golf course wells, it is unlikely to capture Na-Cl type water. Limiting the depth of the ISEGS well with respect to the depth of Colosseum I may provide additional assurance that Na-Cl type water will not be captured.

Particle tracking over a 65-year period, including 15 years of golf course pumping followed by 50 years of golf course and ISEGS pumping, indicates that pumping-induced transport of any anthropogenic contaminants from the Molycorp disposal pond would be very limited. The results of the groundwater flow simulation shows that transport induced by the proposed ISEGS would be at or below the limits of measurement.

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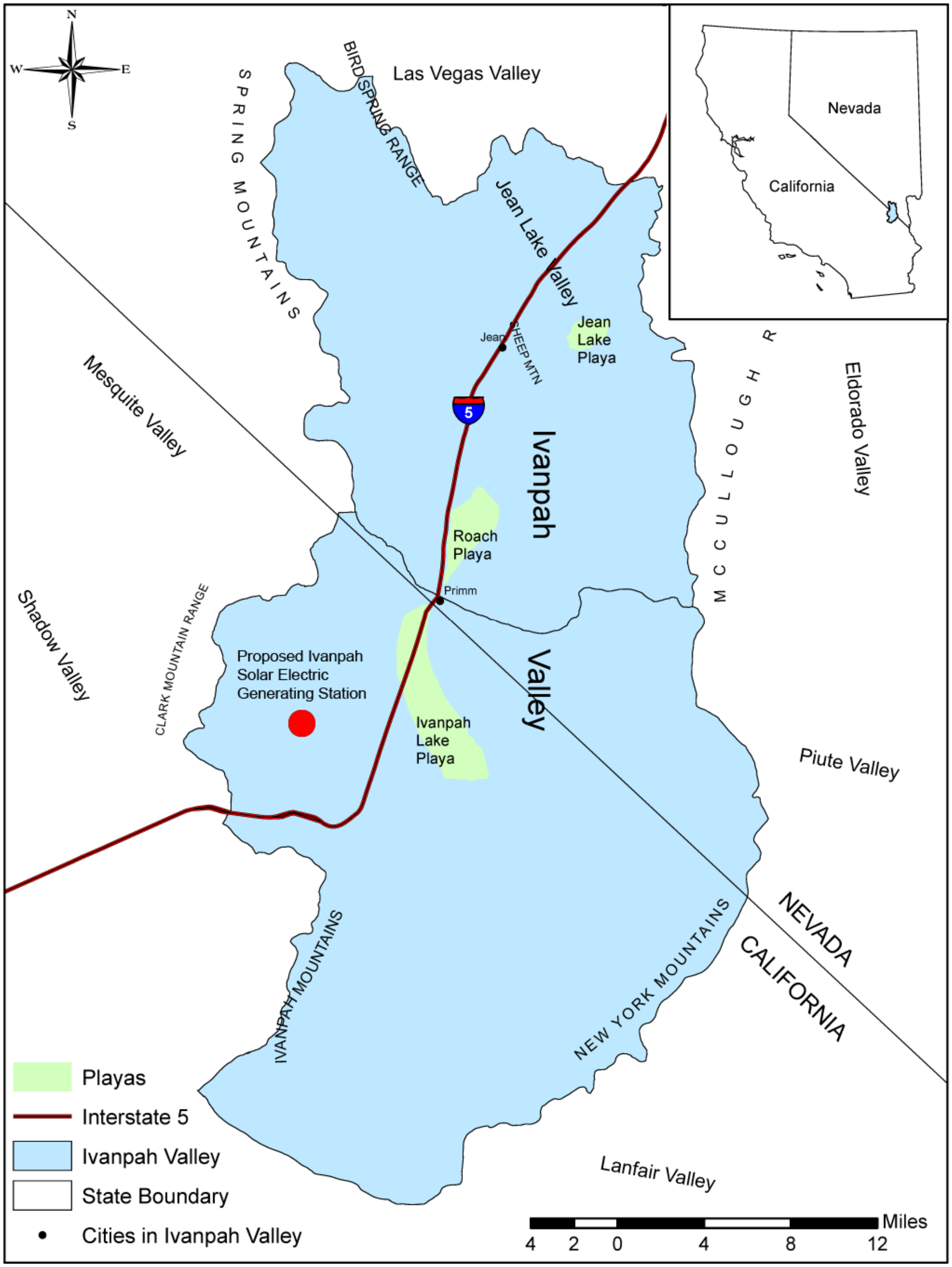

Figure 1

BrightSource Energy
Ivanpah Solar Electric Generating System

LOCATION MAP

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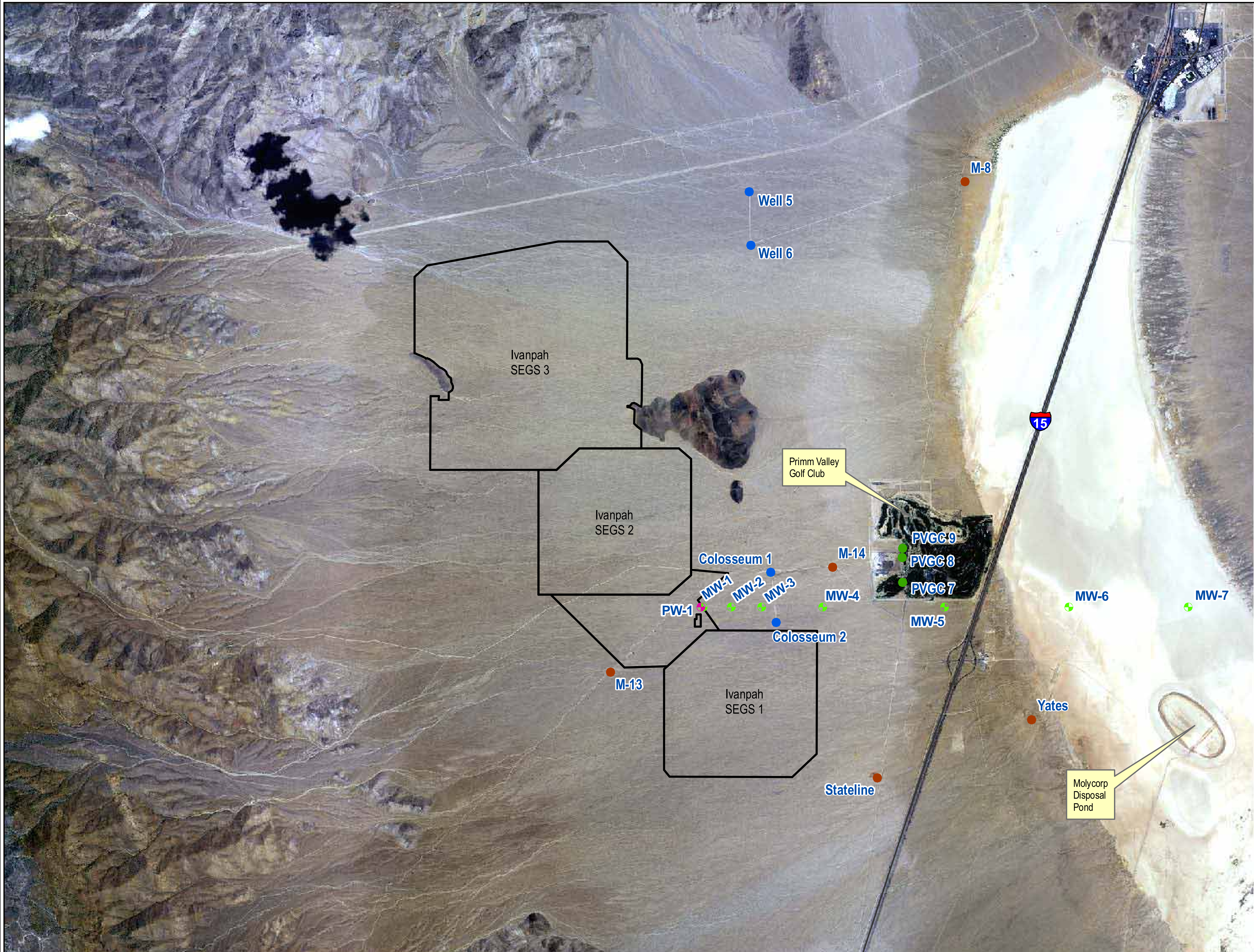

FIGURE 2

BrightSource Energy

Ivanpah Solar Electric Generating System

WELL LOCATIONS

N

0 2,500 5,000

Scale in Feet

Note

1. Well locations are approximate.

LEGEND

- Proposed Ivanpah SEGS Boundaries
- Monitoring Well
- Active Production Well
- Inactive Production Well
- Simulated ISEGS Production Well
- Simulated ISEGS Monitoring Well

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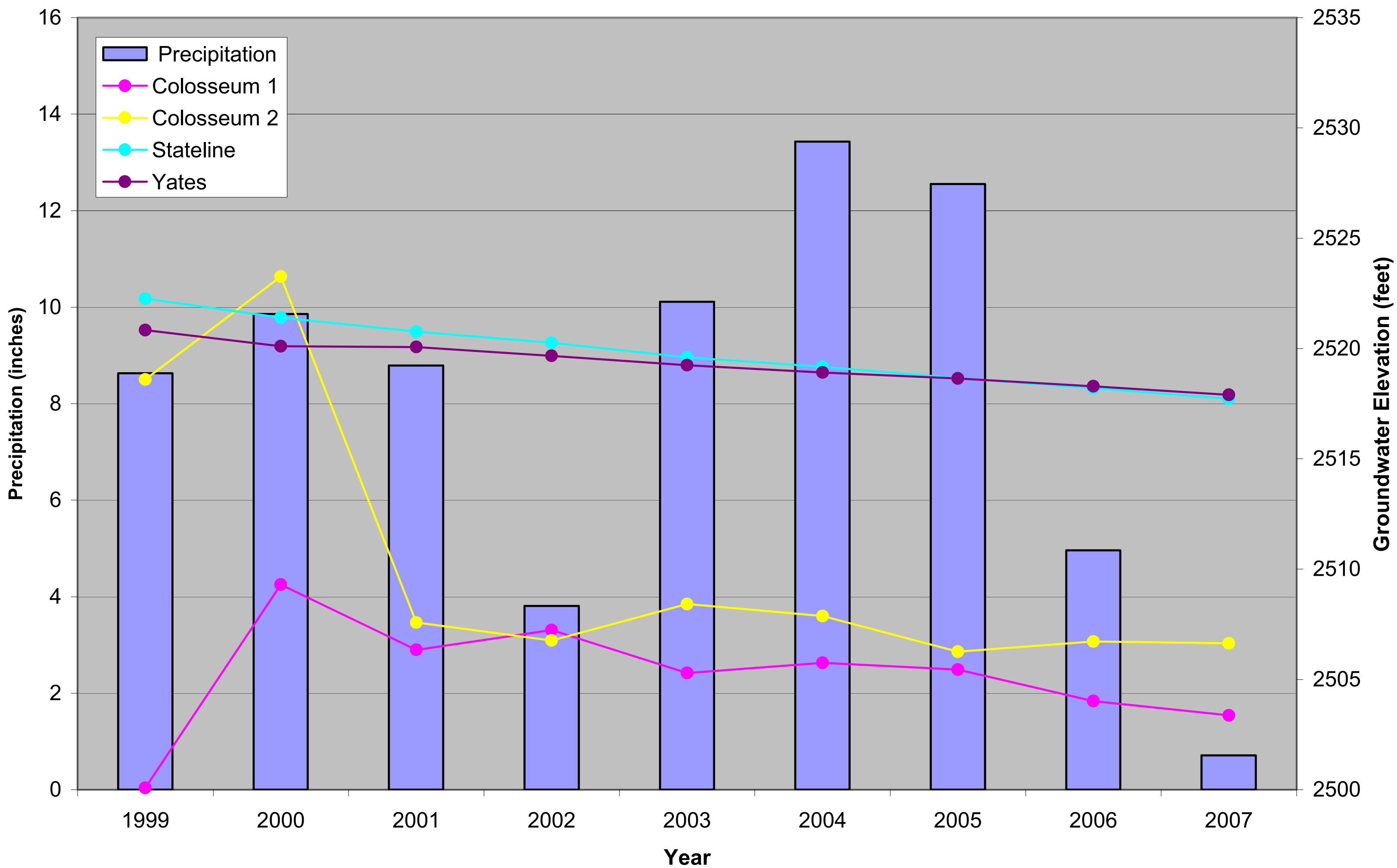

Notes:

1. Groundwater elevations measured December of each year under non-pumping conditions. From: Broadbent & Associates, 2009, Ground-water Monitoring Ten-Year Report, Primm Valley Golf Club, Ivanpah Valley, California, May.
2. Annual precipitation at Mountain Pass station operated by National Weather Service. Accessed from http://cdec.water.ca.gov on May 20, 2009.

Figure 3

BrightSource Energy
Ivanpah Solar Electric Generating System

GROUNDWATER ELEVATION TRENDS

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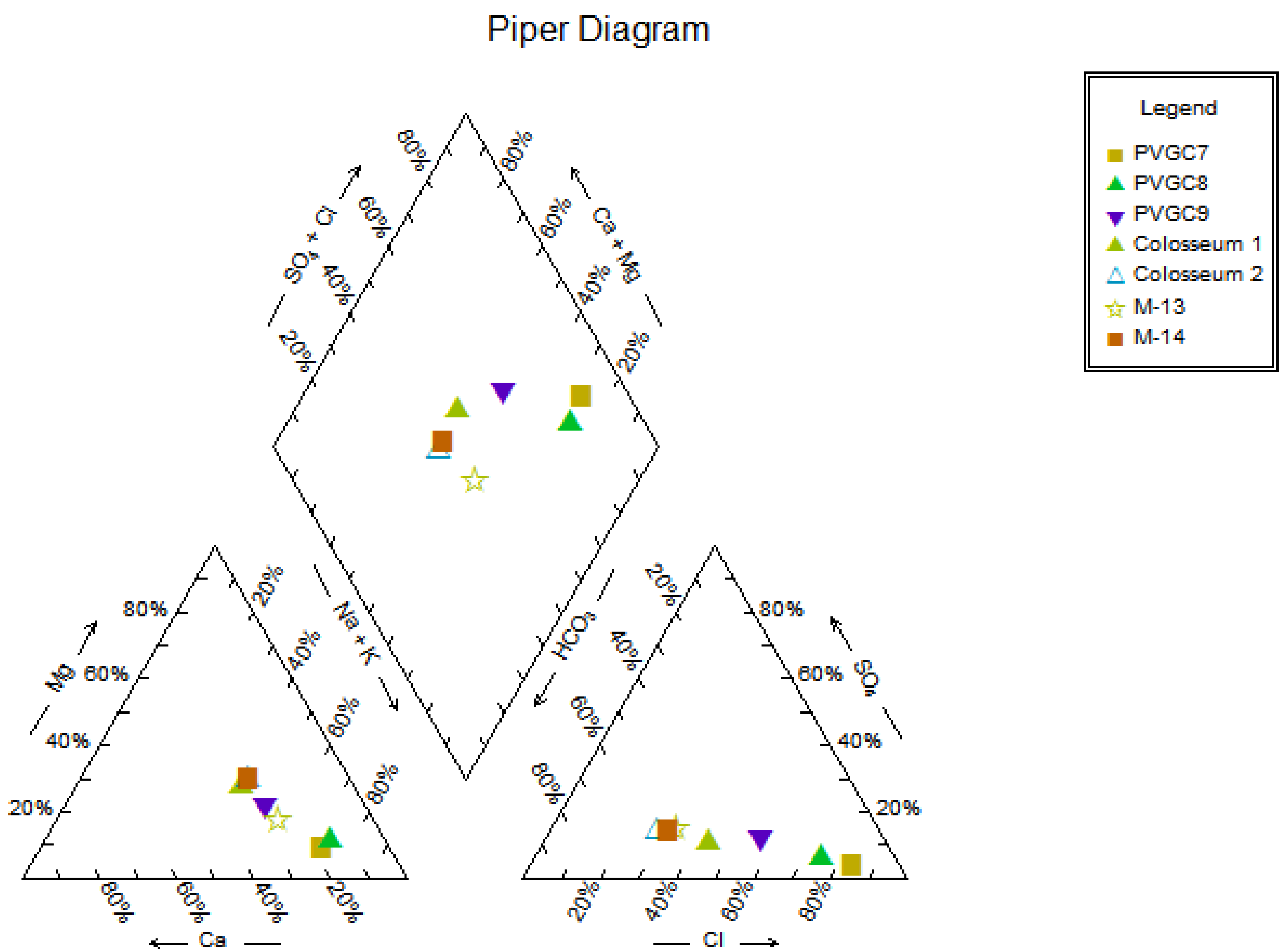

Reference:
Broadbent & Associates, 2009, Ground-water Monitoring Ten-Year Report, Primm Valley Golf Club, Ivanpah Valley, California, May.

Figure 4

BrightSource Energy
Ivanpah Solar Electric Generating System

GROUNDWATER QUALITY TRENDS

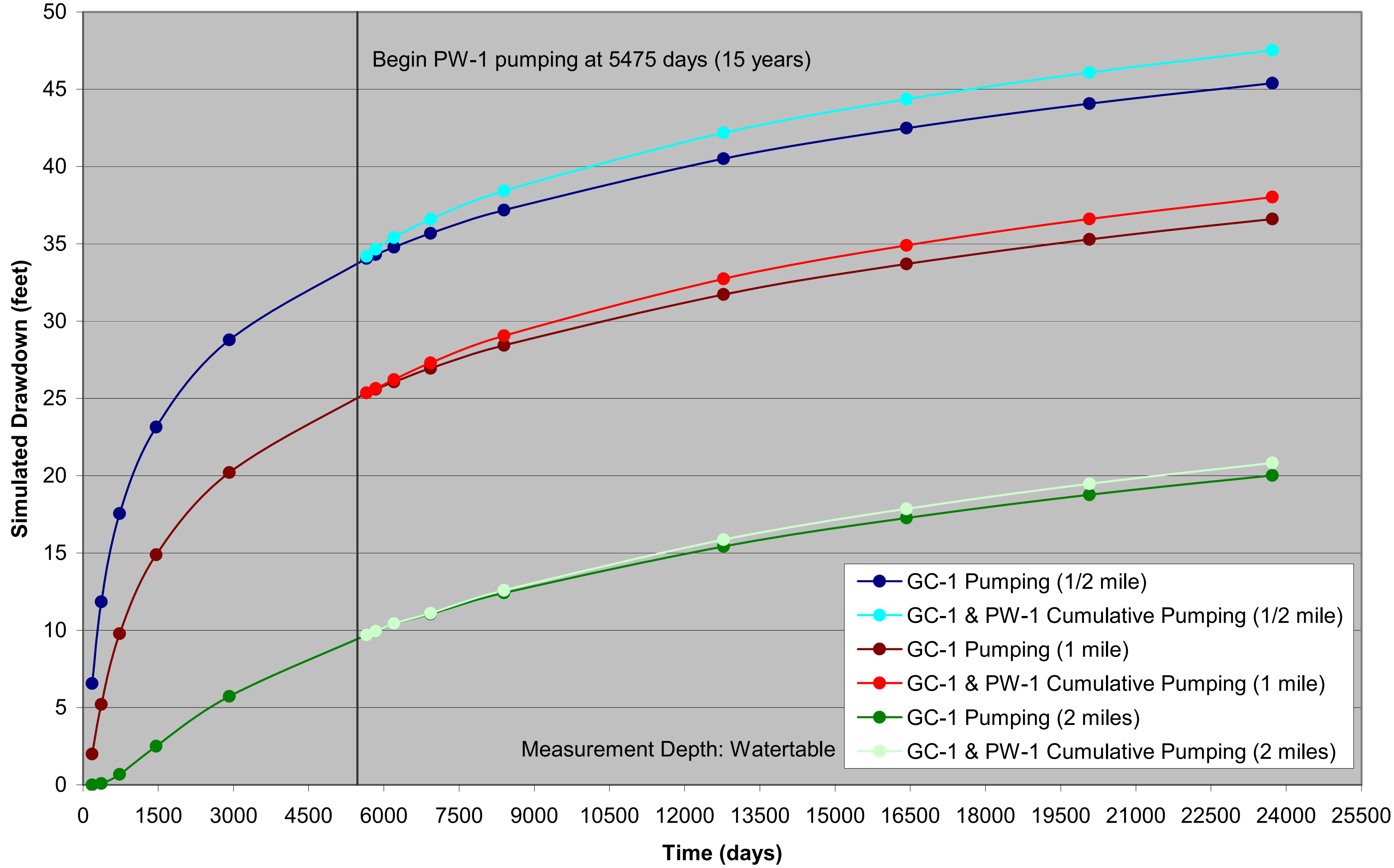

Figure 5

BrightSource Energy
Ivanpah Solar Electric Generating System

WTAQ SIMULATED DRAWDOWNS

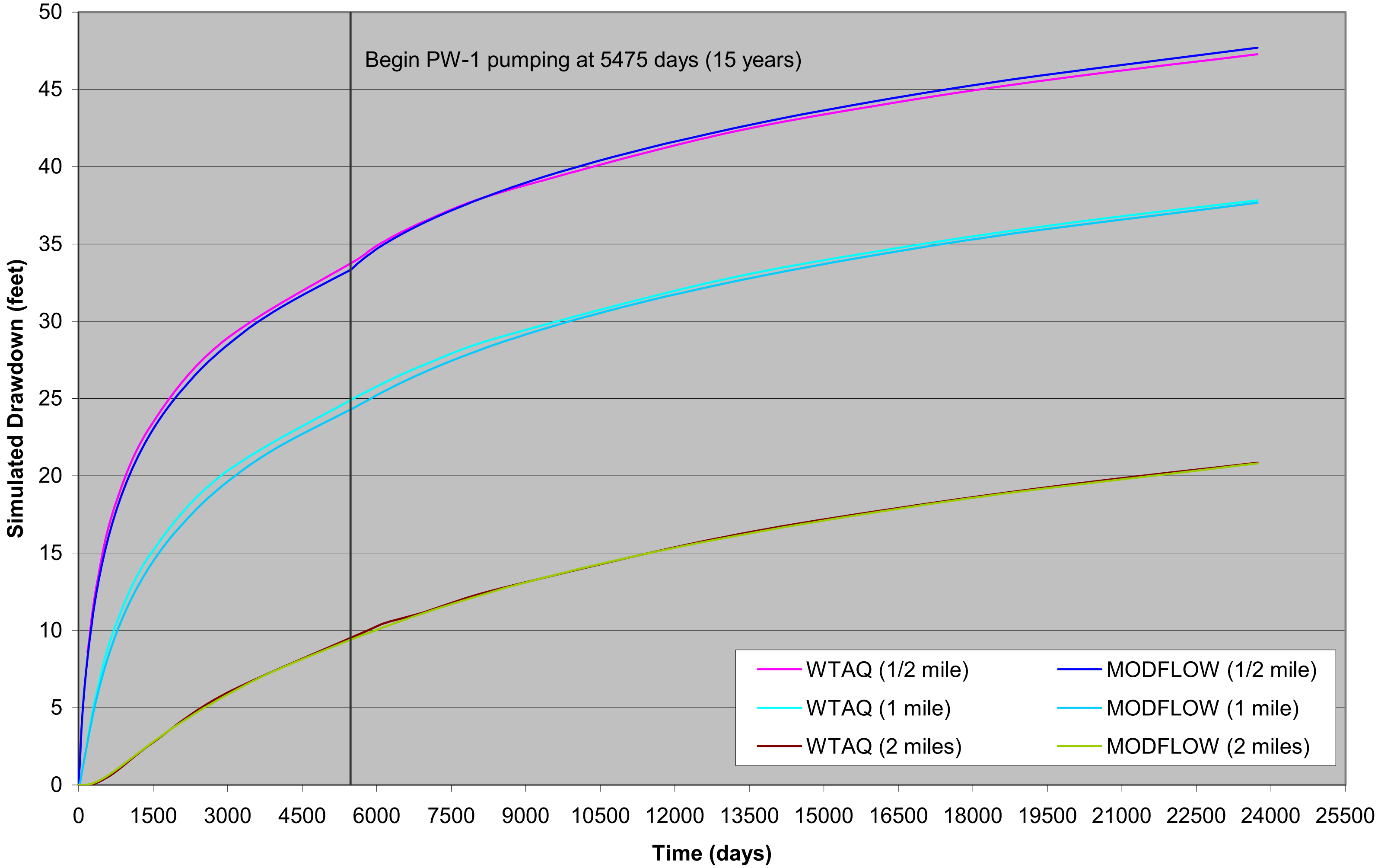

Figure 6

BrightSource Energy
Ivanpah Solar Electric Generating System

COMPARISON OF WTAQ AND MODFLOW SIMULATED DRAWDOWN

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Consulting Engineers

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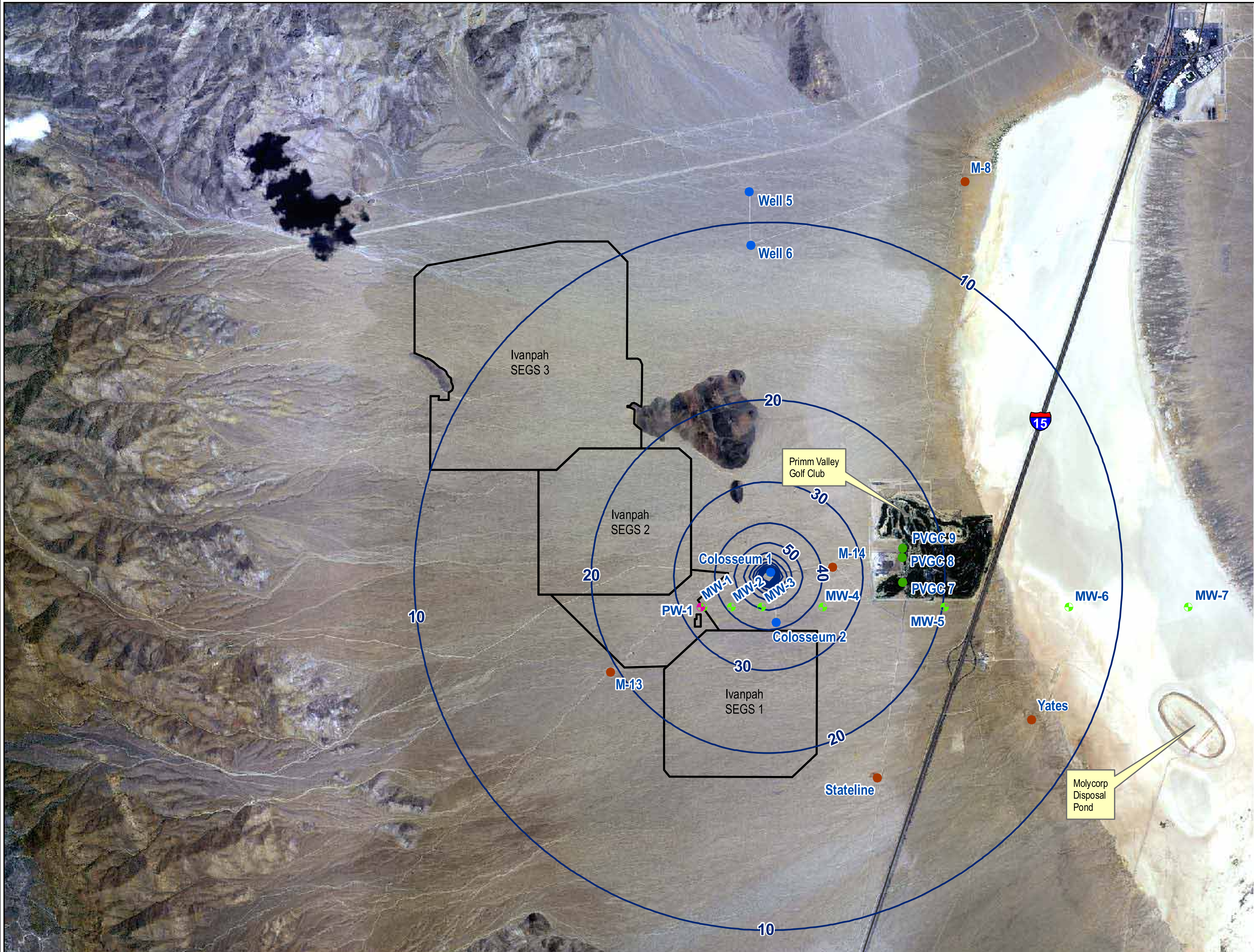

FIGURE 7

BrightSource Energy

Ivanpah Solar Electric Generating System

SIMULATED BASELINE CONDITIONS

0 2,500 5,000

Scale in Feet

Notes
1. Well locations are approximate.
2. Contours depict simulated drawdown due to 65 years of Primm Valley Golf Club pumping.

LEGEND

- Proposed Ivanpah SEGS Boundaries
- Drawdown contour (feet)
- Monitoring Well
- Active Production Well
- Inactive Production Well
- Simulated ISEGS Production Well
- Simulated ISEGS Monitoring Well

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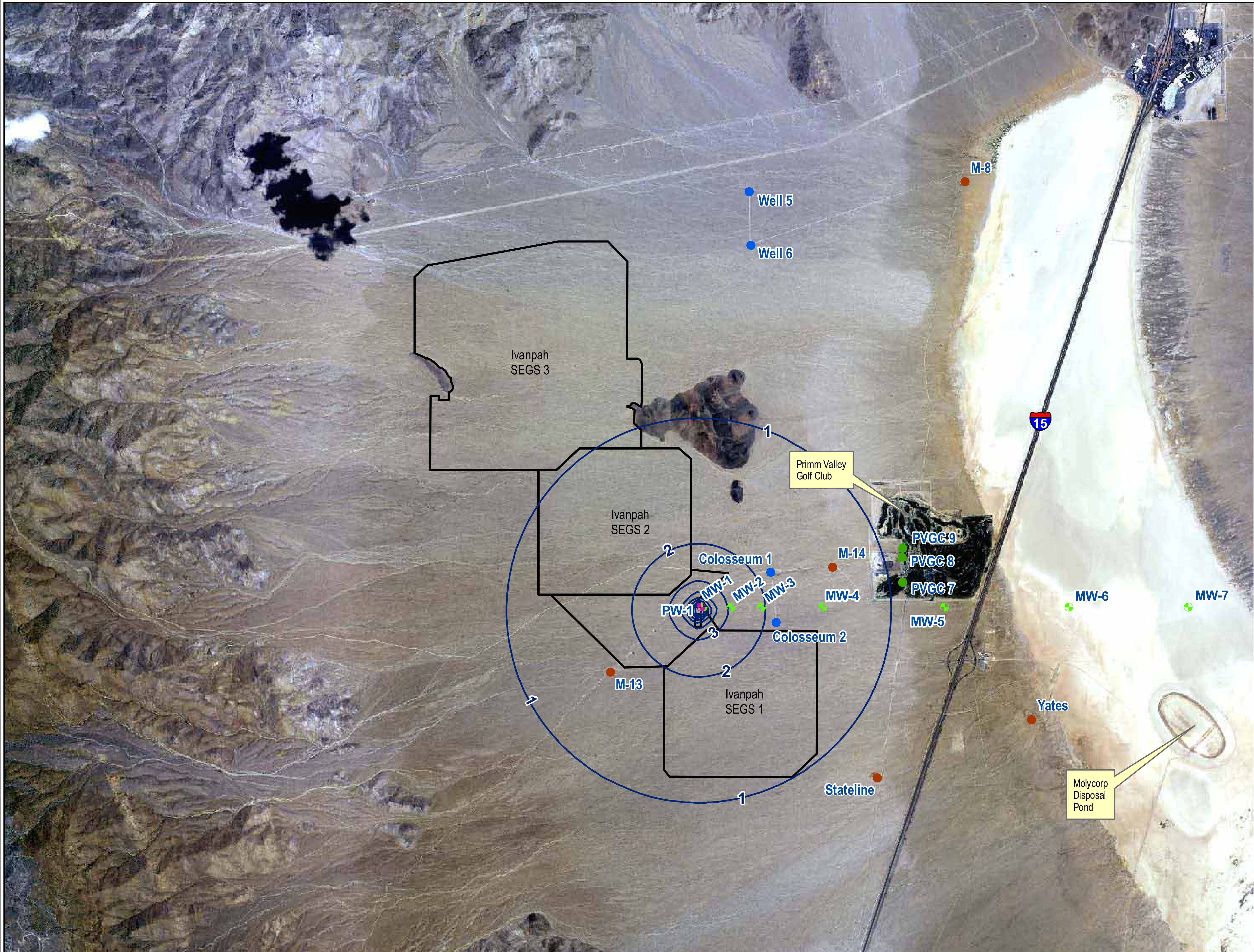
FIGURE 8

BrightSource Energy

Ivanpah Solar Electric Generating System

SIMULATED INCREMENTAL INCREASE IN DRAWDOWN



N

0 2,500 5,000

Scale in Feet

Notes
1. Well locations are approximate.
2. Contours depict simulated drawdown due to 50 years of ISEGS pumping.

LEGEND

- Proposed Ivanpah SEGS Boundaries
- Drawdown contour (feet)
- Monitoring Well
- Active Production Well
- Inactive Production Well
- Simulated ISEGS Production Well
- Simulated ISEGS Monitoring Well

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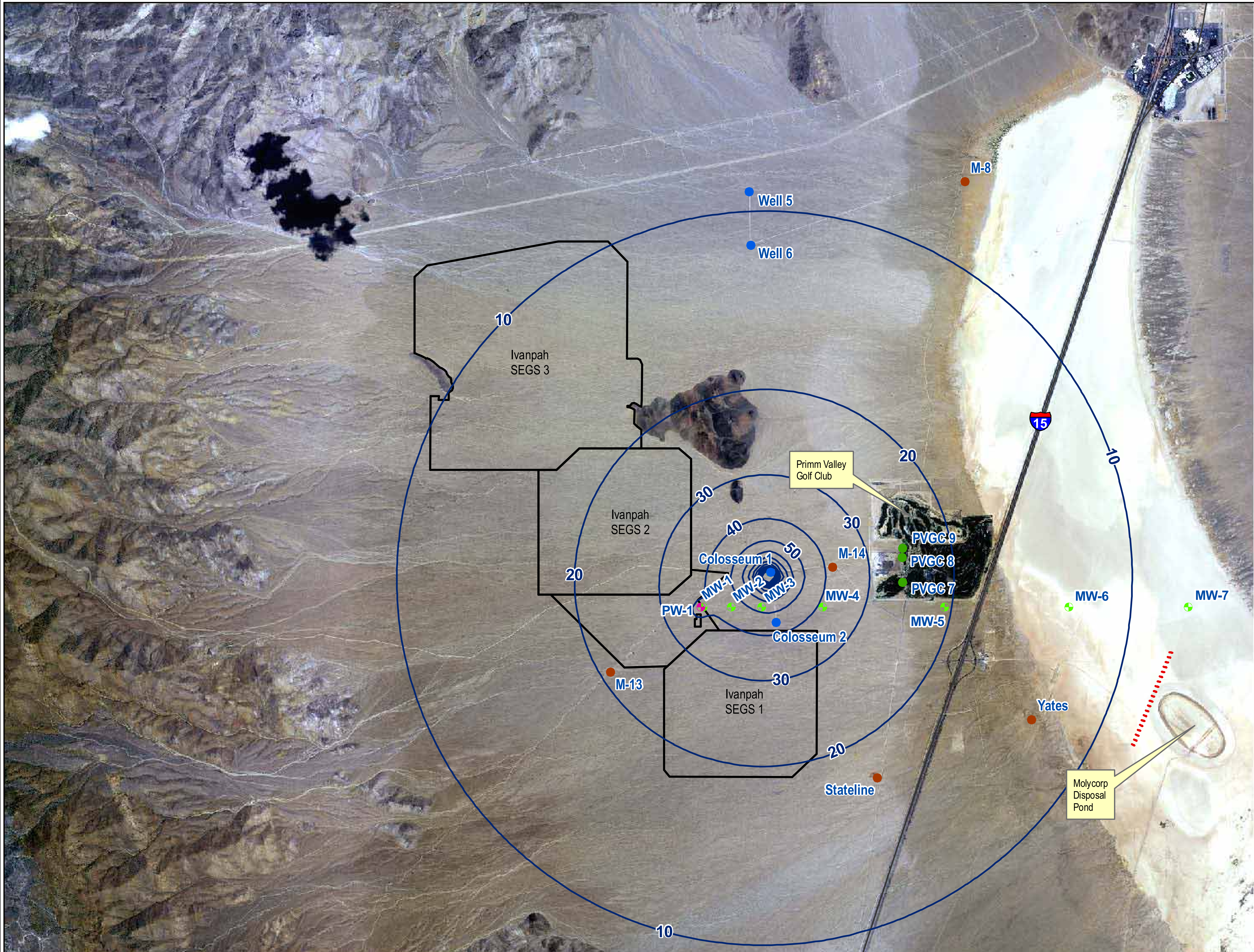
Consulting Engineers

FIGURE 9

BrightSource Energy

Ivanpah Solar Electric Generating System

SIMULATED ISEGS PROJECT CONDITIONS



Notes

1. Well locations are approximate.
2. Contours depict simulated drawdown due to 15 years of Primm Valley Golf Club pumping followed by 50 years of pumping by Primm Valley Golf Club and ISEGS.

LEGEND

- Proposed Ivanpah SEGS Boundaries
- Drawdown contour (feet)
- MODPATH Particle Traces
- Monitoring Well
- Active Production Well
- Inactive Production Well
- Simulated ISEGS Production Well
- Simulated ISEGS Monitoring Well

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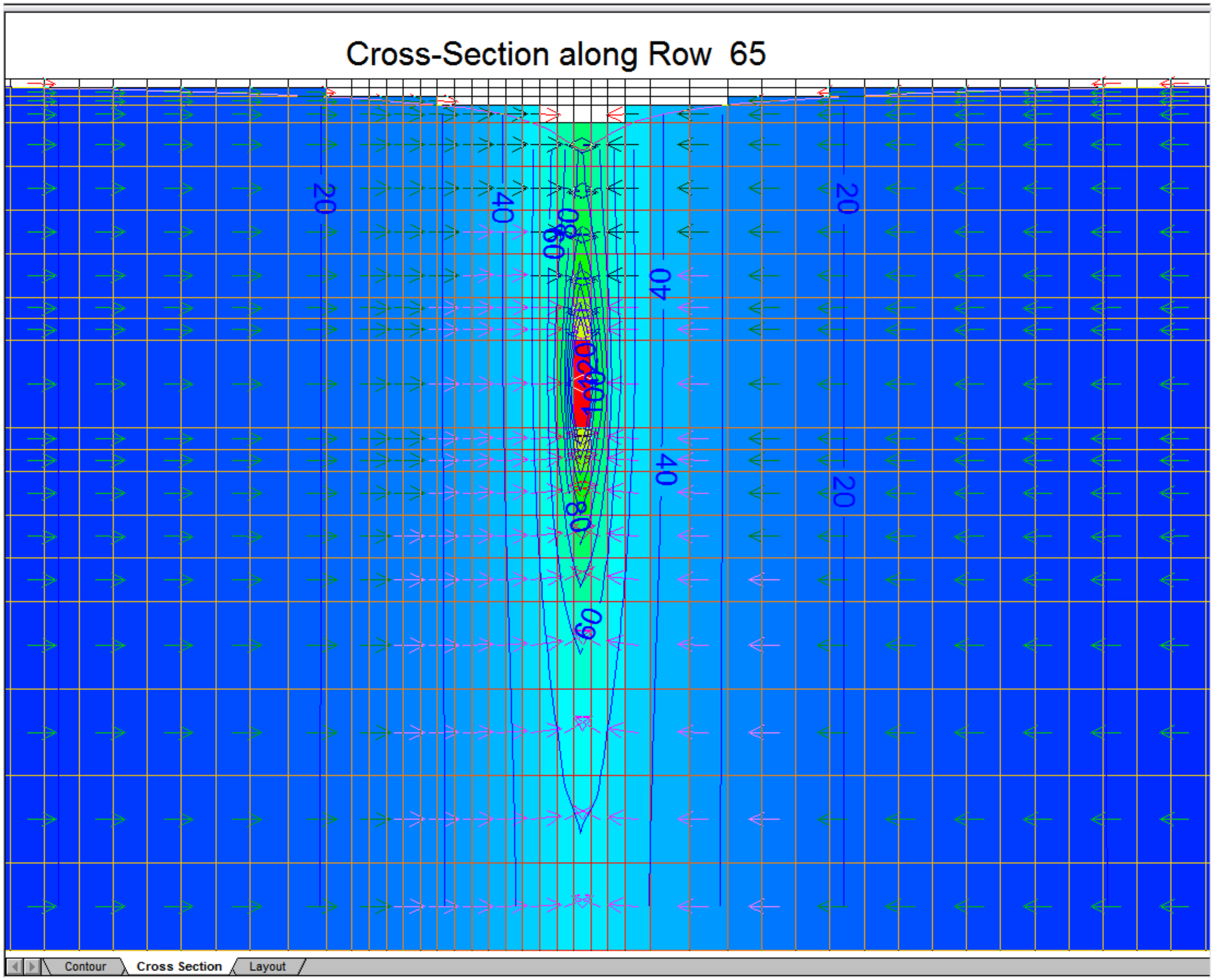


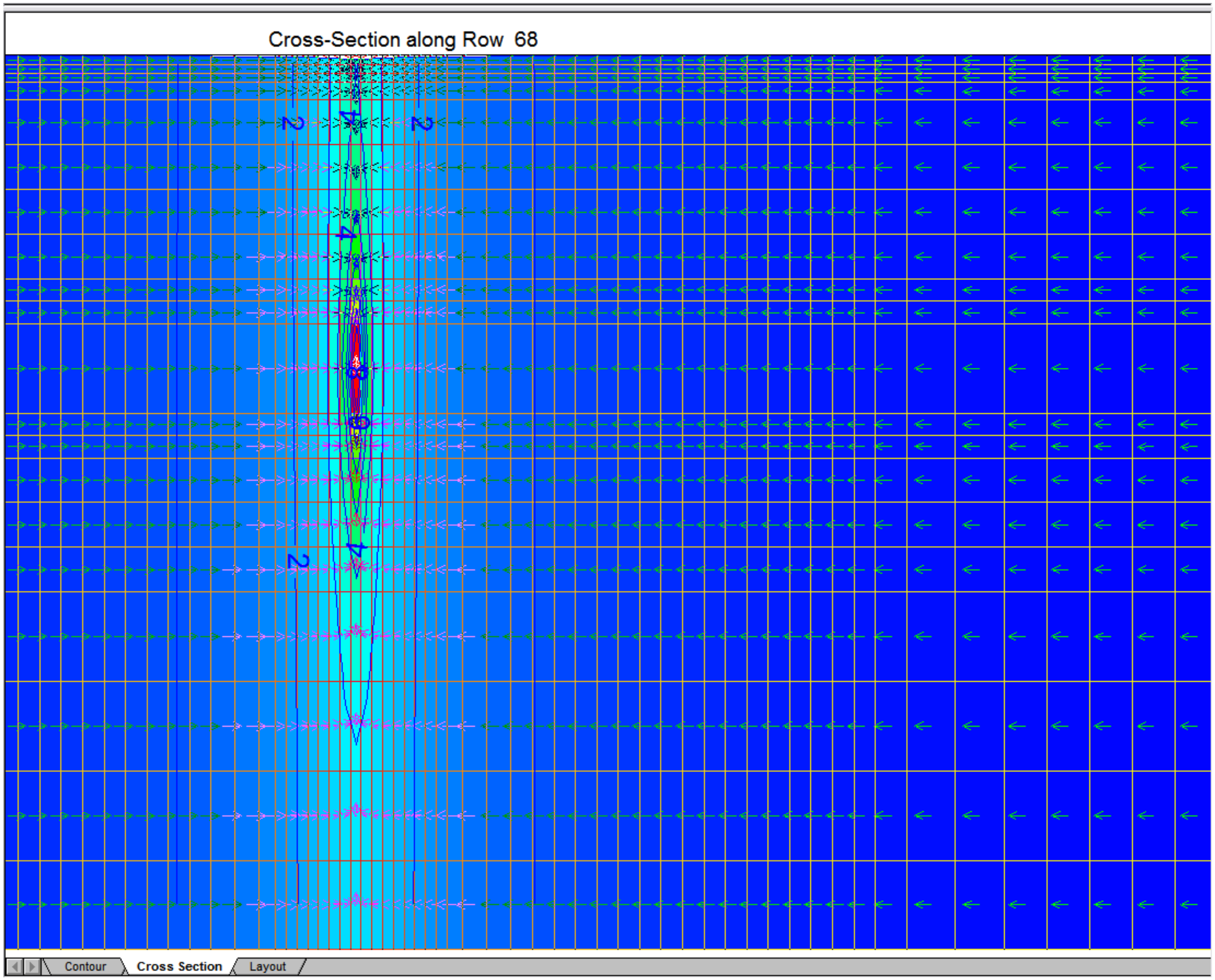
Contours are simulated drawdown in feet due to 65 years of Primm Golf Club pumping. Velocity vectors indicate incremental change in flow directions due to pumping.

Figure 10

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED INCREMENTAL CHANGE IN FLOW VELOCITY VECTORS DUE TO PRIMM GOLF CLUB PUMPING

West Yost Associates
Consulting Engineers



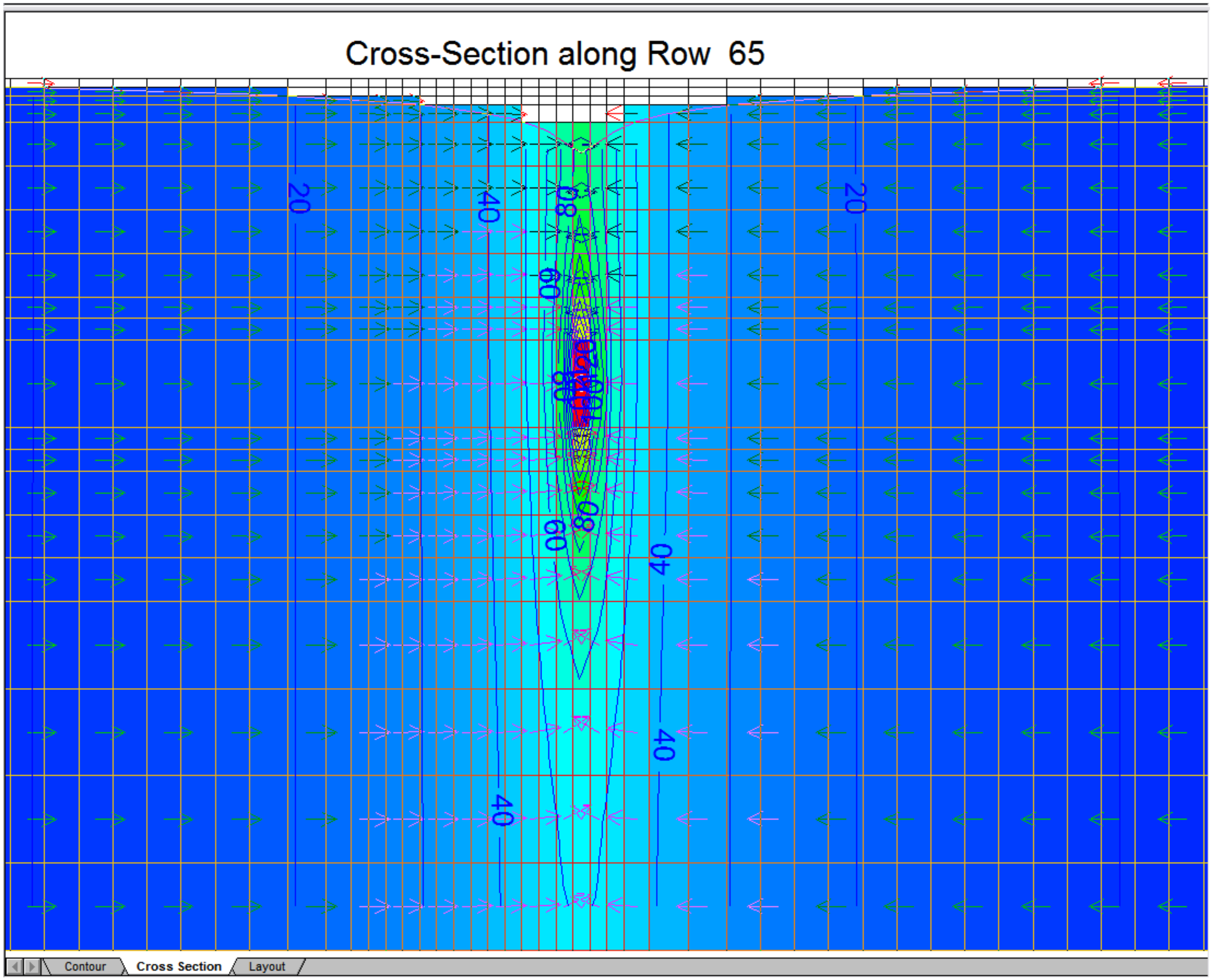
Contours are simulated drawdown in feet due to ISEGS pumping after 50 years. Velocity vectors indicate incremental change in flow directions due to ISEGS pumping.

Figure 11

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED INCREMENTAL CHANGE IN FLOW VELOCITY VECTORS DUE TO ISEGS PUMPING

WEST YOST ASSOCIATES
Consulting Engineers

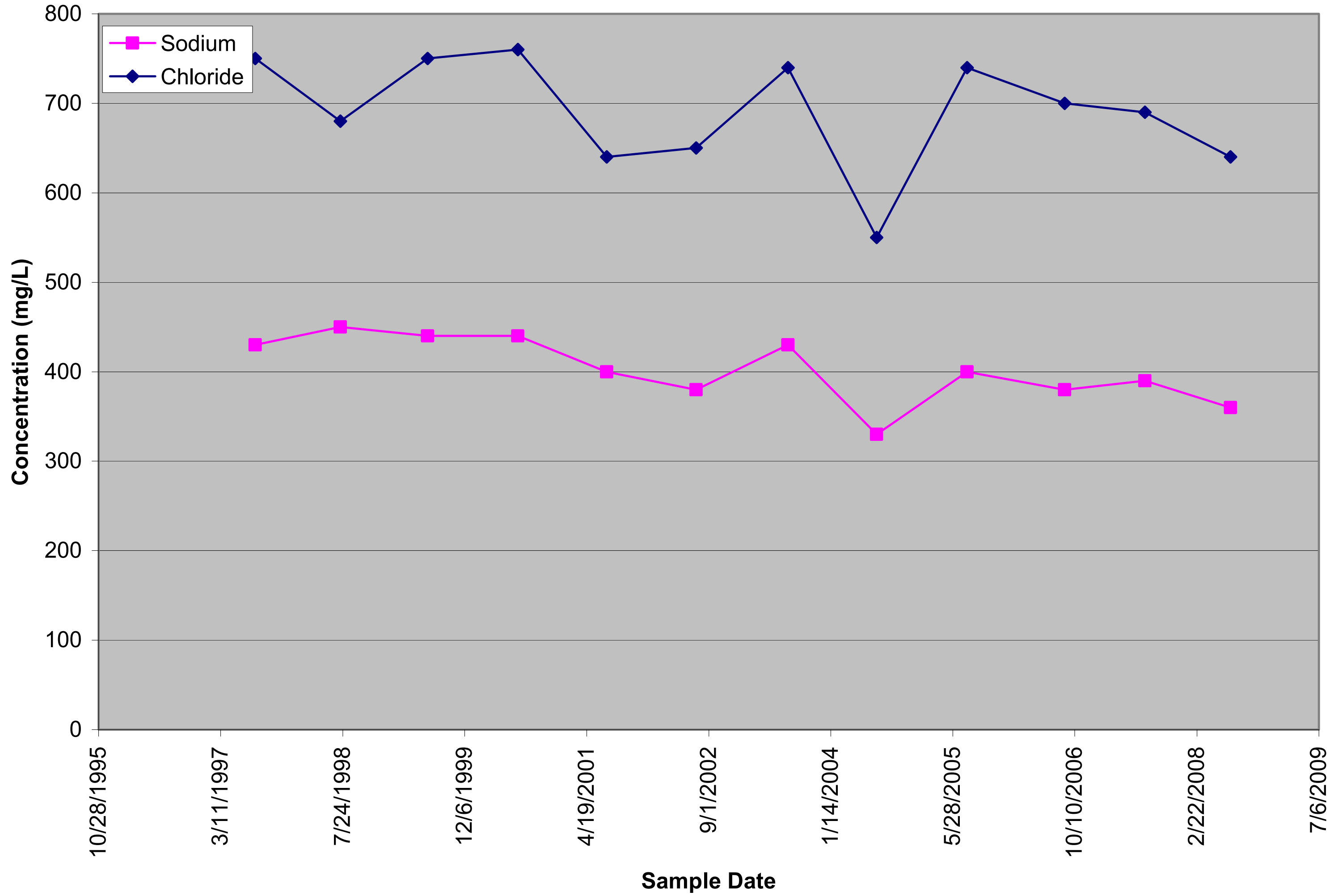


Contours are simulated drawdown in feet due to 65 years of Primm Valley Golf Club and 50 years of ISEGS pumping. Velocity vectors indicate incremental change in flow directions due to pumping.

Figure 12

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED INCREMENTAL CHANGE IN FLOW VELOCITY VECTORS DUE TO PRIMM GOLF CLUB AND ISEGS PUMPING



Reference:
Broadbent & Associates, 2009, Ground-water Monitoring Ten-Year Report, Primm Valley Golf Club, Ivanpah Valley, California, May.

Figure A-1

BrightSource Energy
Ivanpah Solar Electric Generating System

SODIUM AND CHLORIDE IN PVCG 7

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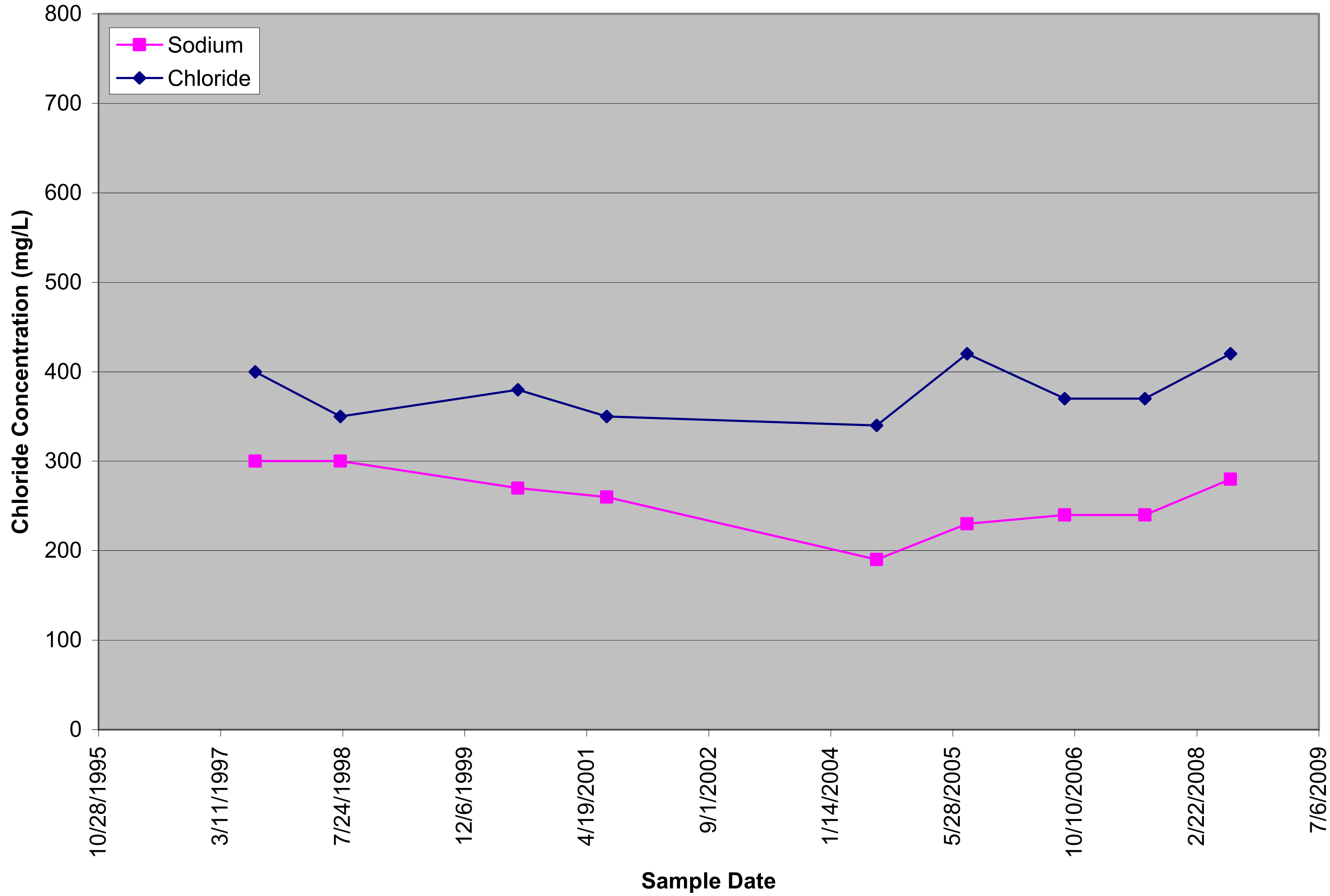


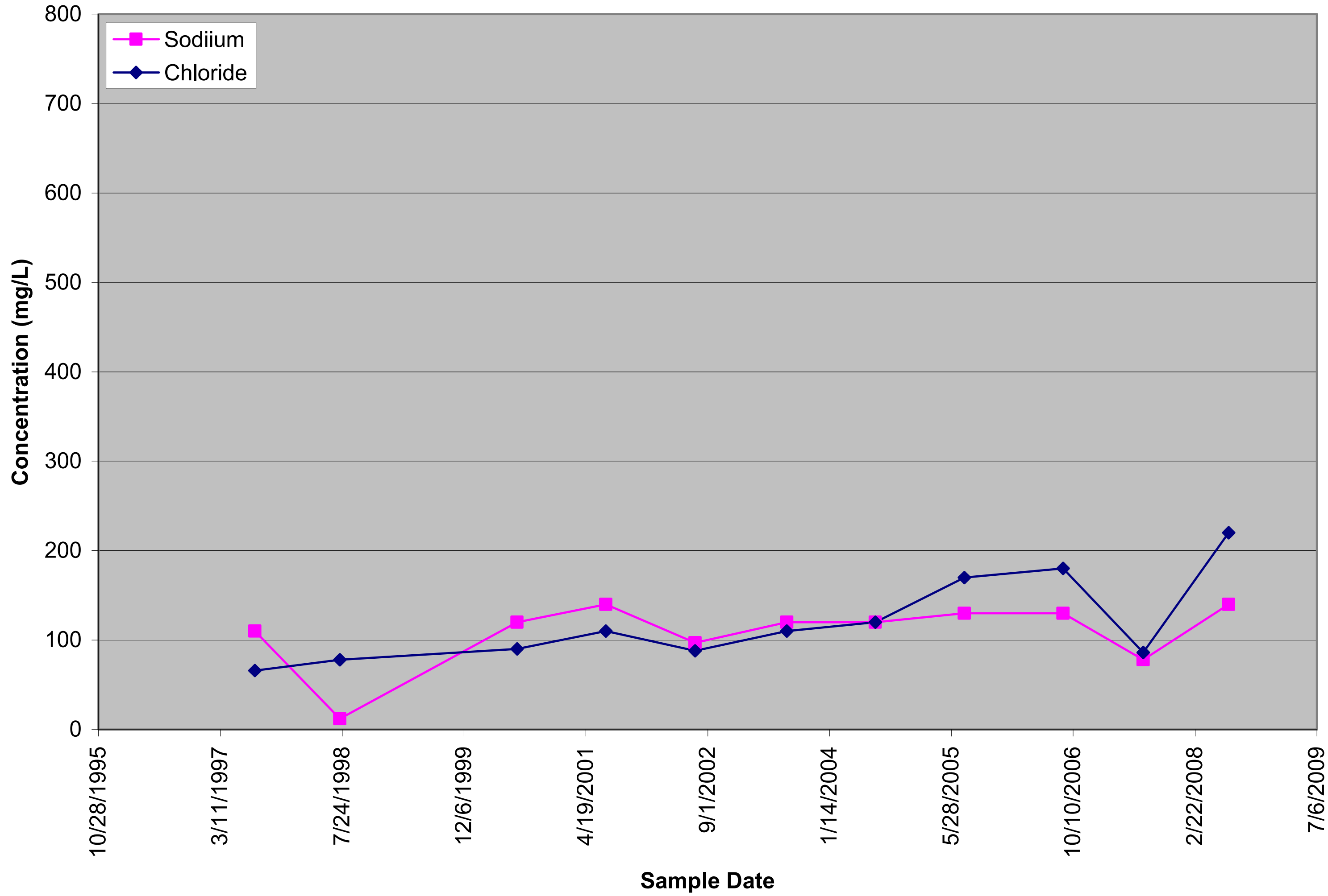
Reference:
Broadbent & Associates, 2009, Ground-water Monitoring Ten-Year Report, Primm Valley Golf Club, Ivanpah Valley, California, May.

Figure A-2

BrightSource Energy
Ivanpah Solar Electric Generating System

SODIUM AND CHLORIDE IN PVCG 8

WEST YOST ASSOCIATES
Consulting Engineers



Reference:
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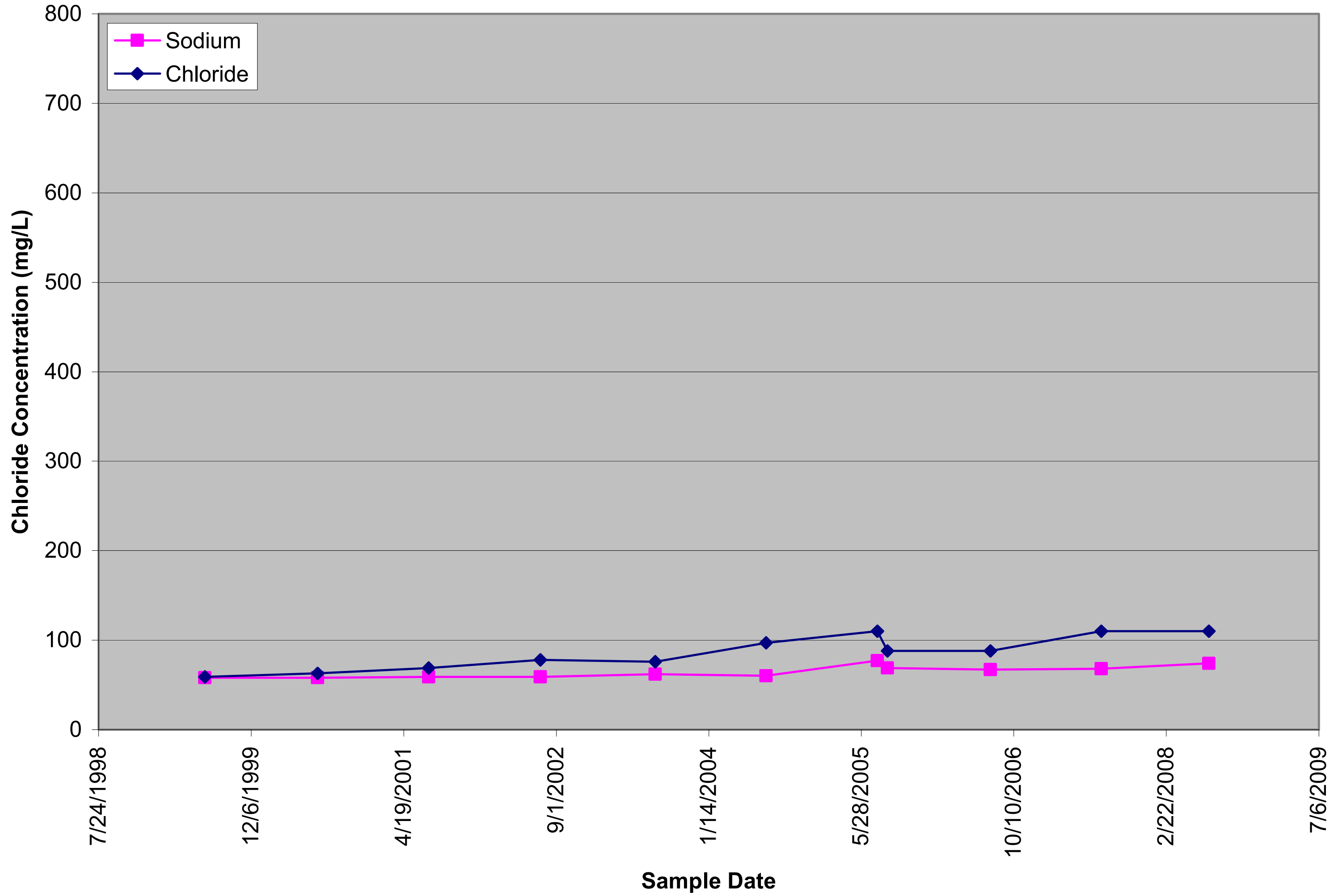
Figure A-3

BrightSource Energy
Ivanpah Solar Electric Generating System

SODIUM AND CHLORIDE IN PVCG 9

West Yost Associates
Consulting Engineers

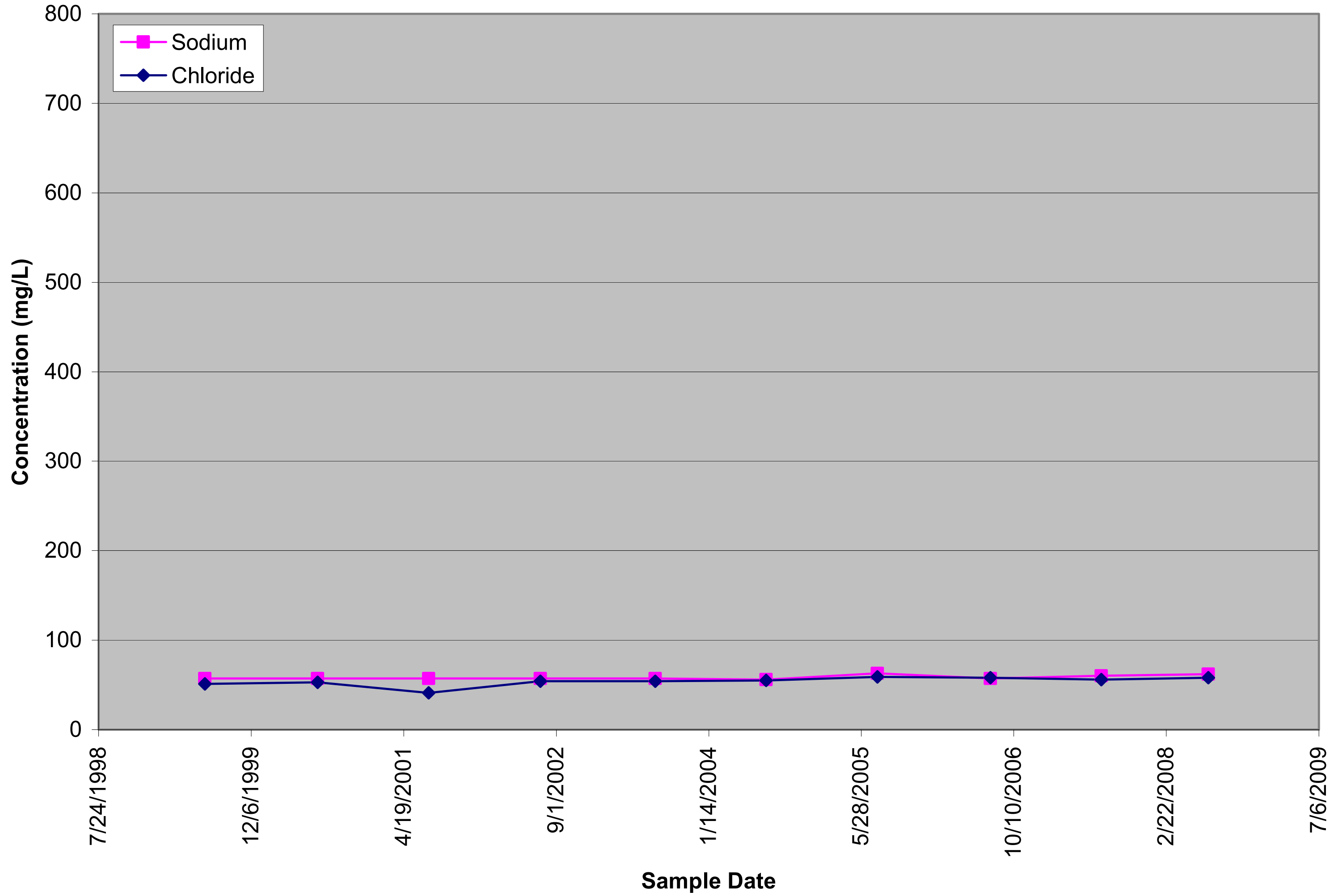


Reference:
Broadbent & Associates, 2009, Ground-water Monitoring Ten-Year Report, Primm Valley Golf Club, Ivanpah Valley, California, May.

Figure A-4

BrightSource Energy
Ivanpah Solar Electric Generating System

SODIUM AND CHLORIDE IN COLOSSEUM 1



Reference:
Broadbent & Associates, 2009, Ground-water Monitoring Ten-Year Report, Primm Valley Golf Club, Ivanpah Valley, California, May.

Figure A-5

BrightSource Energy
Ivanpah Solar Electric Generating System

SODIUM AND CHLORIDE IN COLOSSEUM 2

WEST YOST ASSOCIATES
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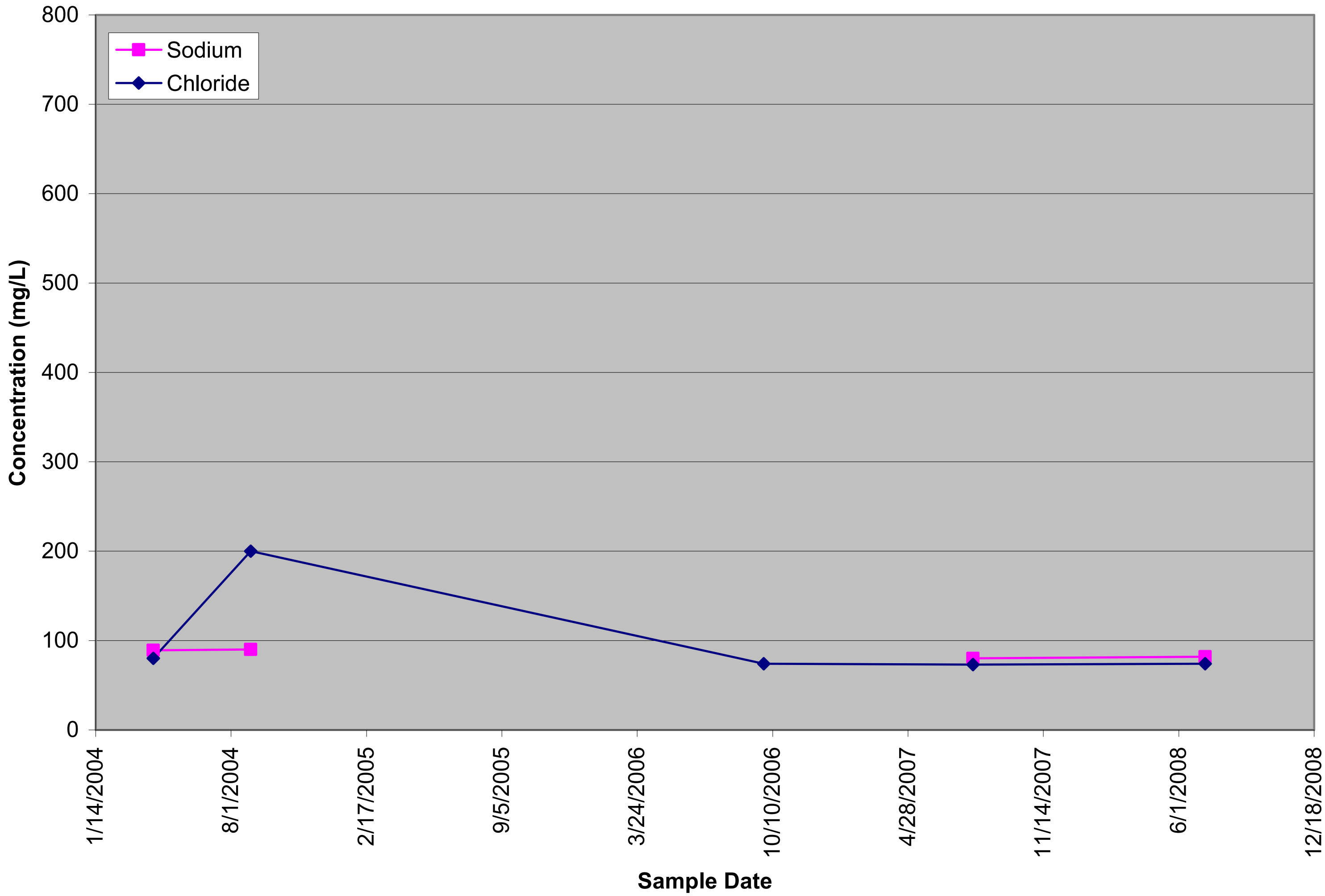

Reference:
Broadbent & Associates, 2009, Ground-water Monitoring Ten-Year Report, Primm Valley Golf Club, Ivanpah Valley, California, May.

Figure A-6

BrightSource Energy
Ivanpah Solar Electric Generating System

SODIUM AND CHLORIDE IN M13

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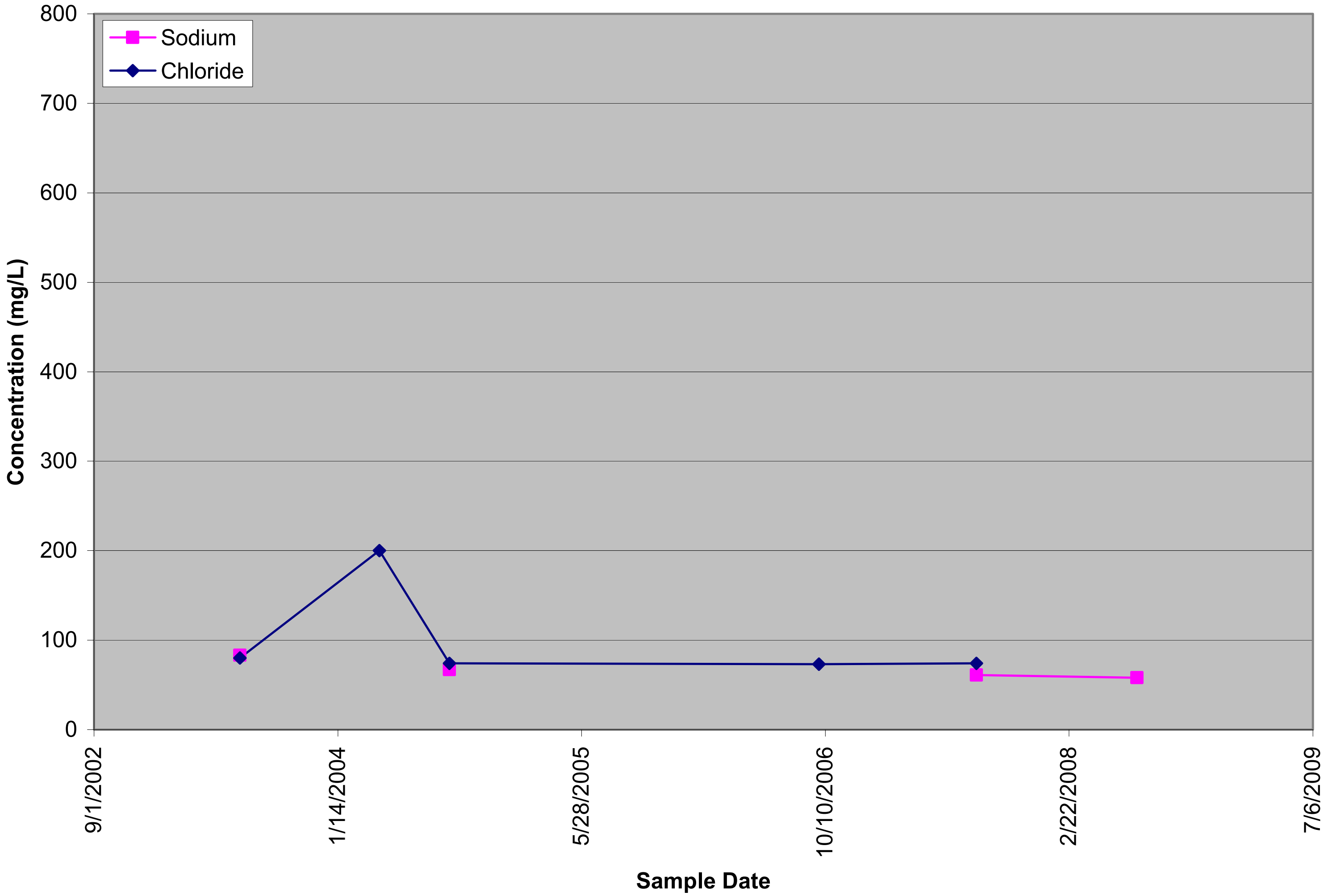
Consulting Engineers



Reference:
Broadbent & Associates, 2009, Ground-water Monitoring Ten-Year Report, Primm Valley Golf Club, Ivanpah Valley, California, May.

Figure A-7

BrightSource Energy
Ivanpah Solar Electric Generating System

SODIUM AND CHLORIDE IN M14

WEST YOST ASSOCIATES
Consulting Engineers

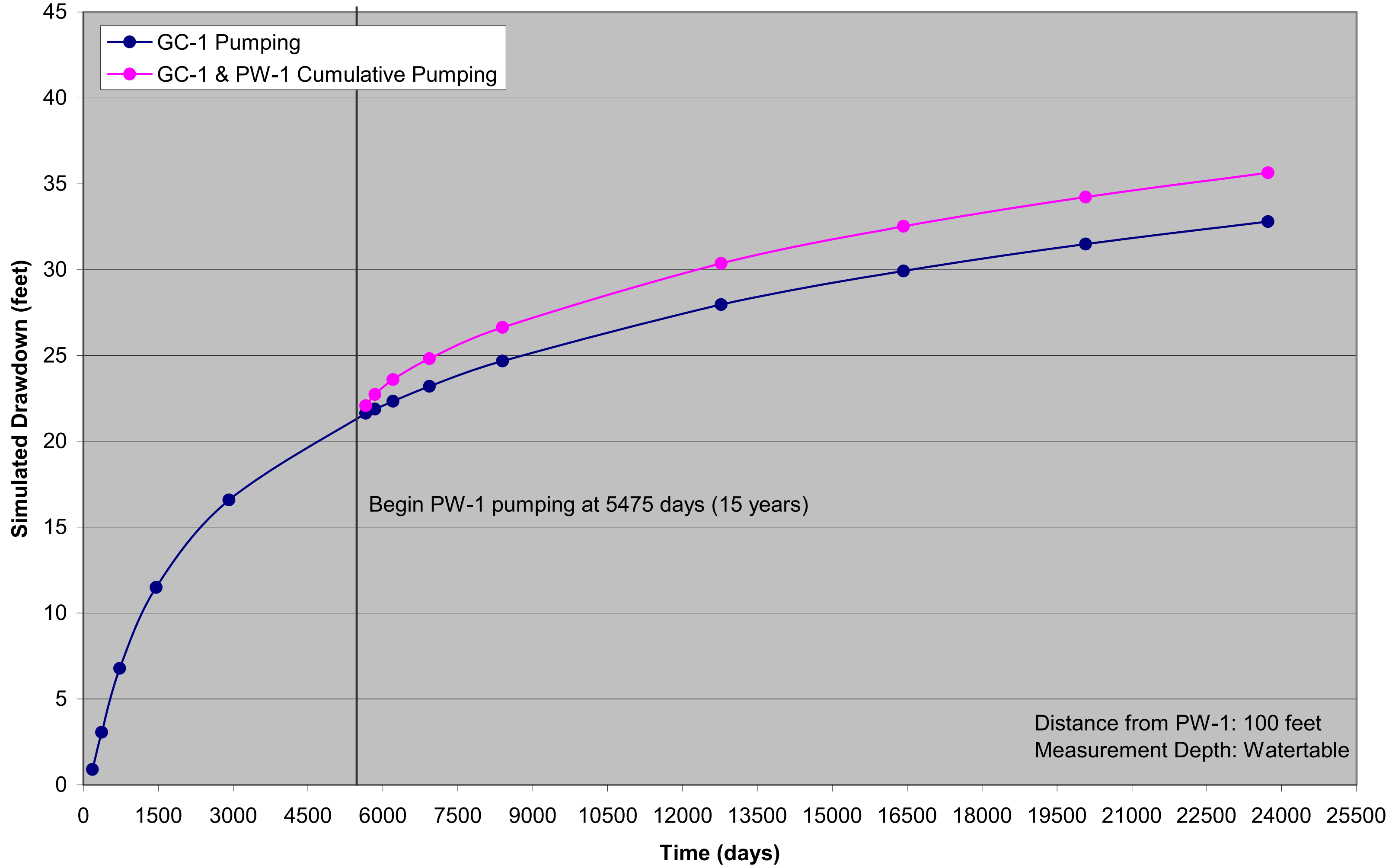


Figure B-1

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-1000

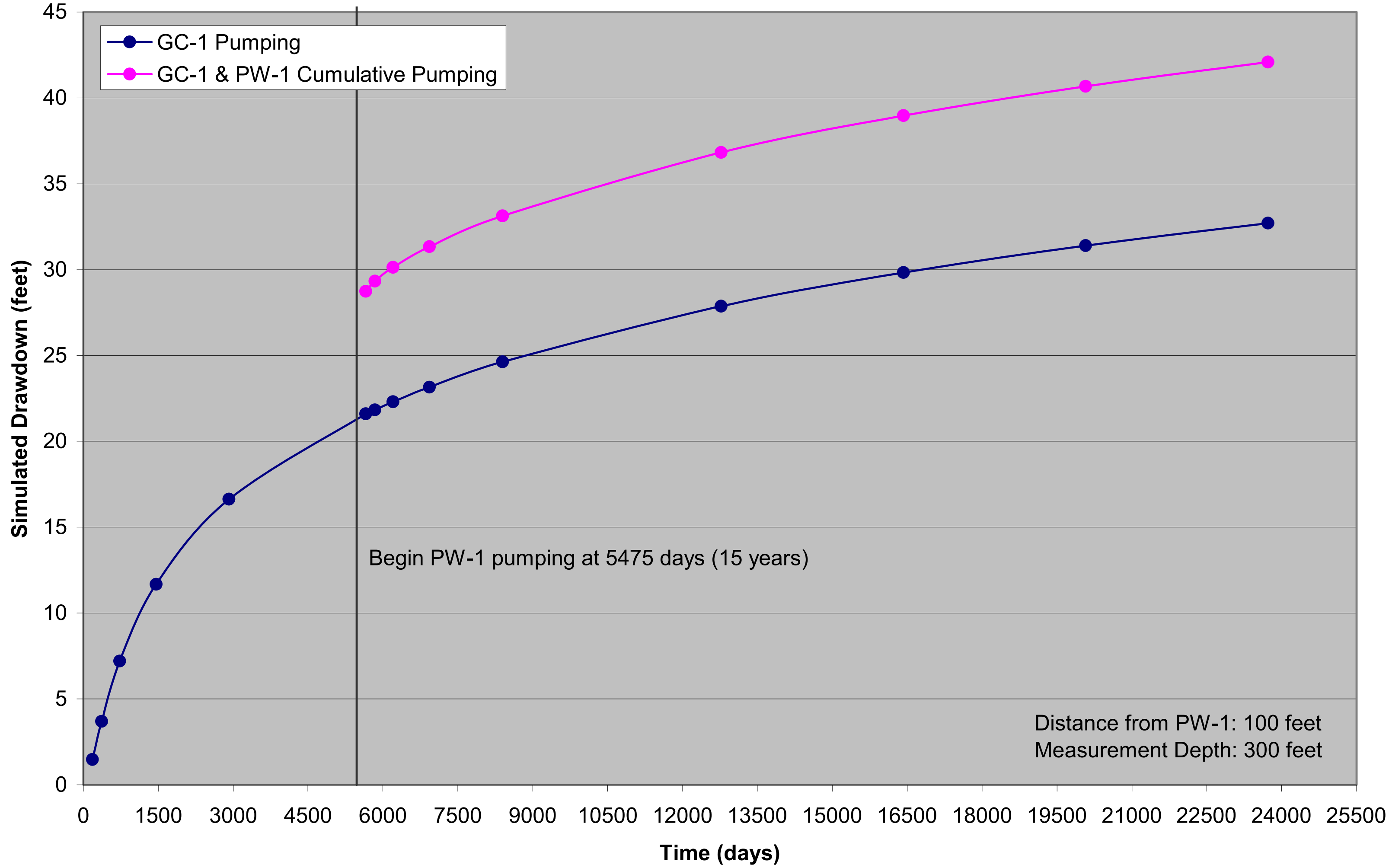


Figure B-2

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-1300

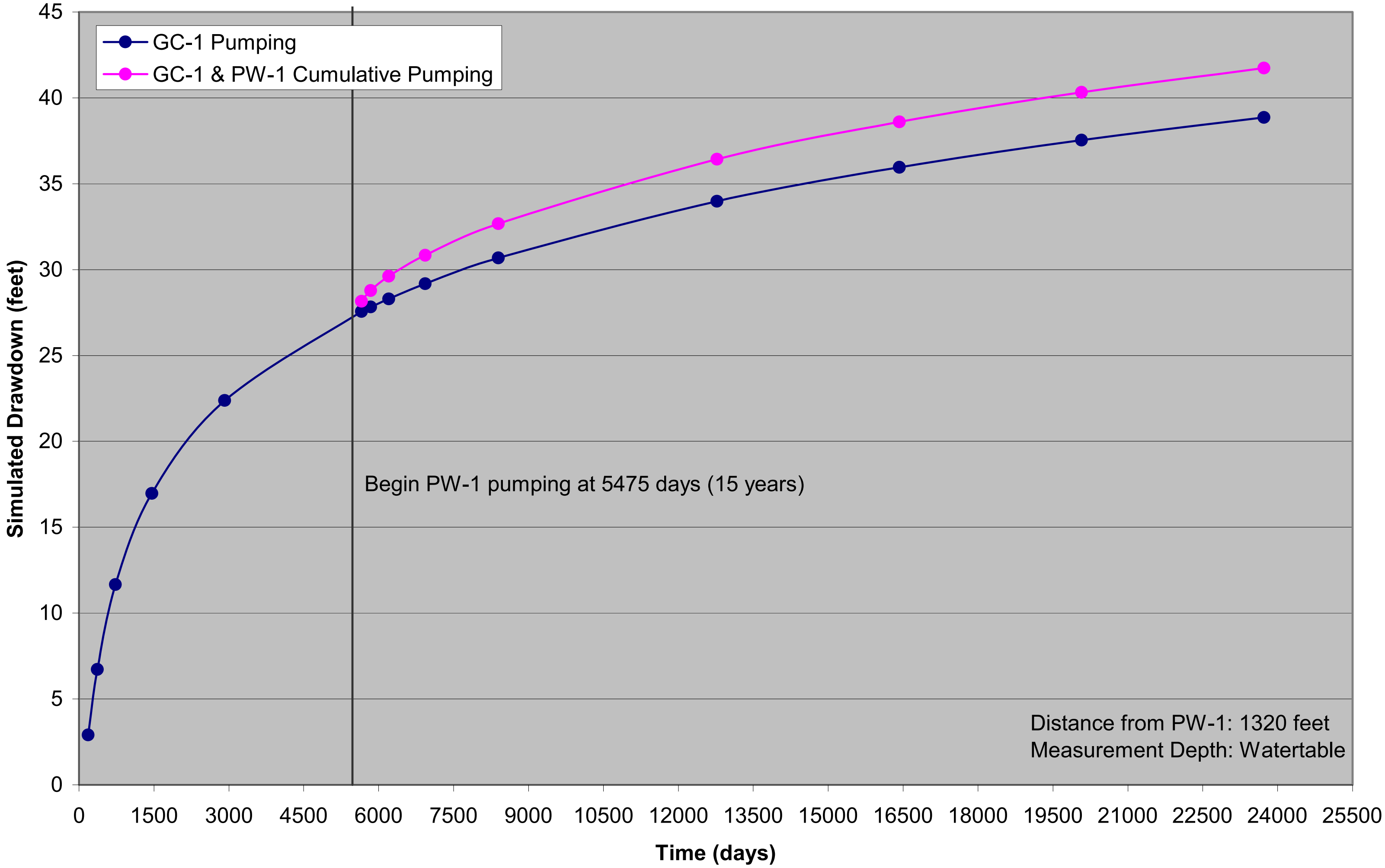


Figure B-3

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-2000

WEST YOST ASSOCIATES Consulting Engineers

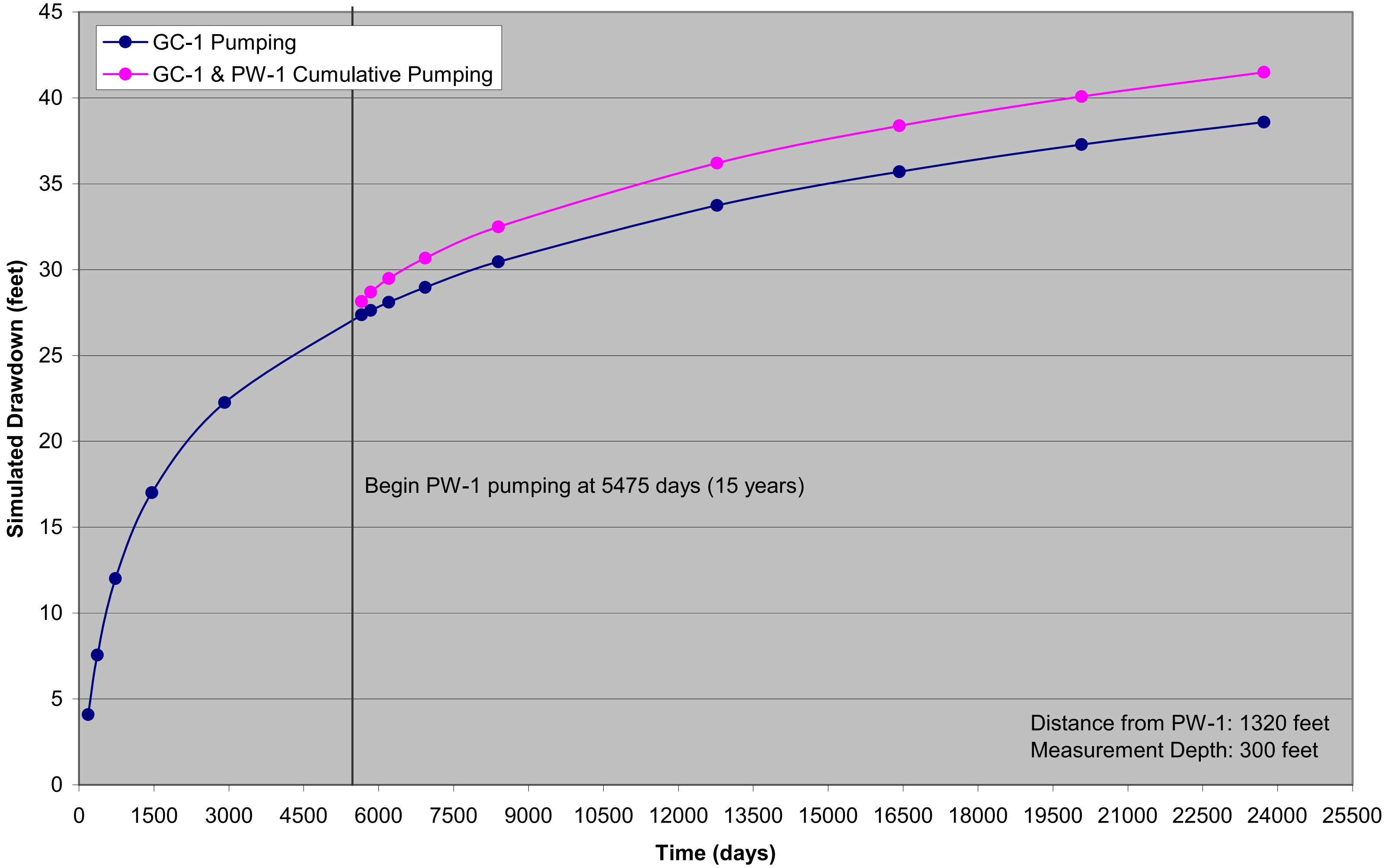


Figure B-4

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-2300

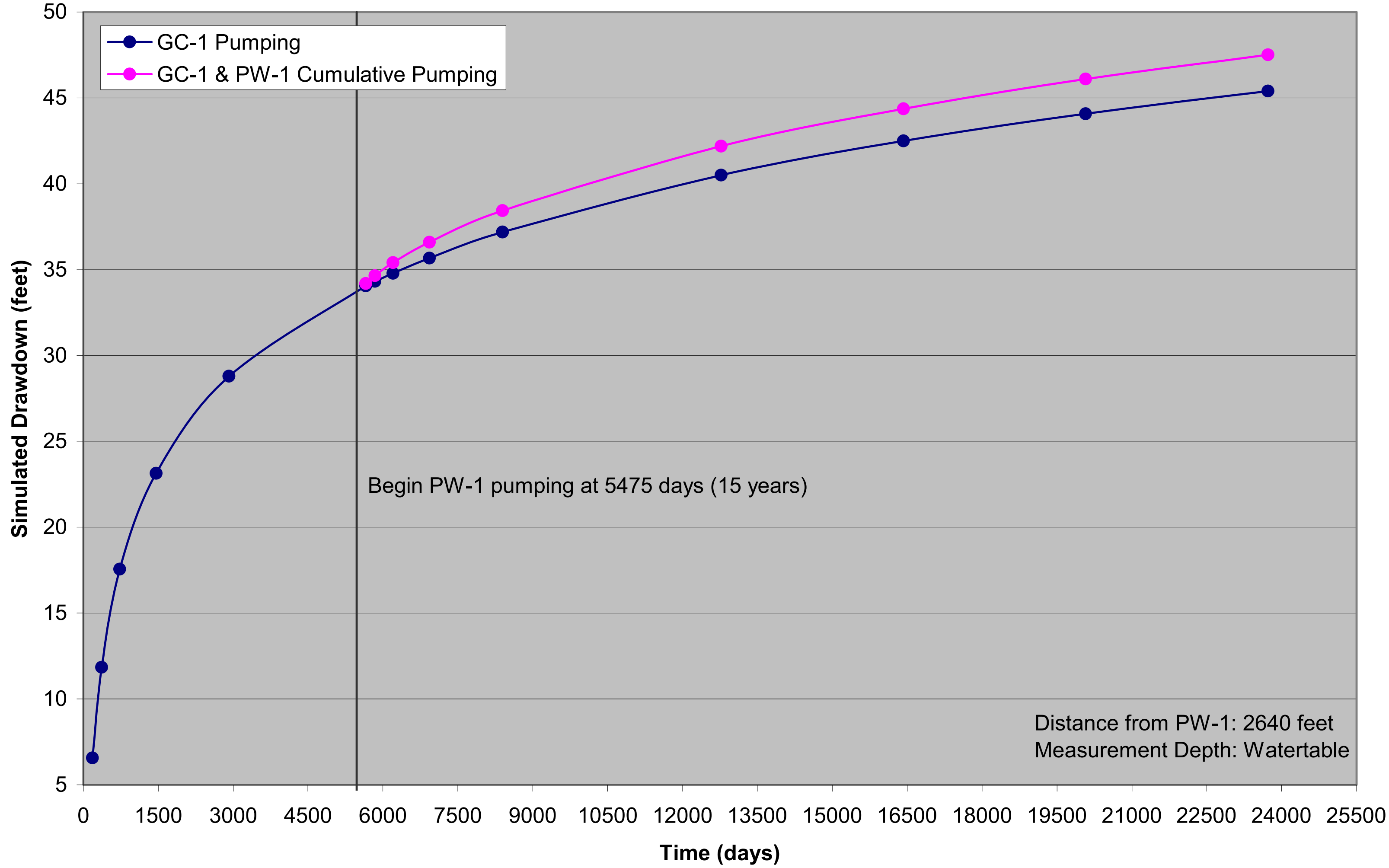


Figure B-5

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-3000

WEST YOST ASSOCIATES
Consulting Engineers

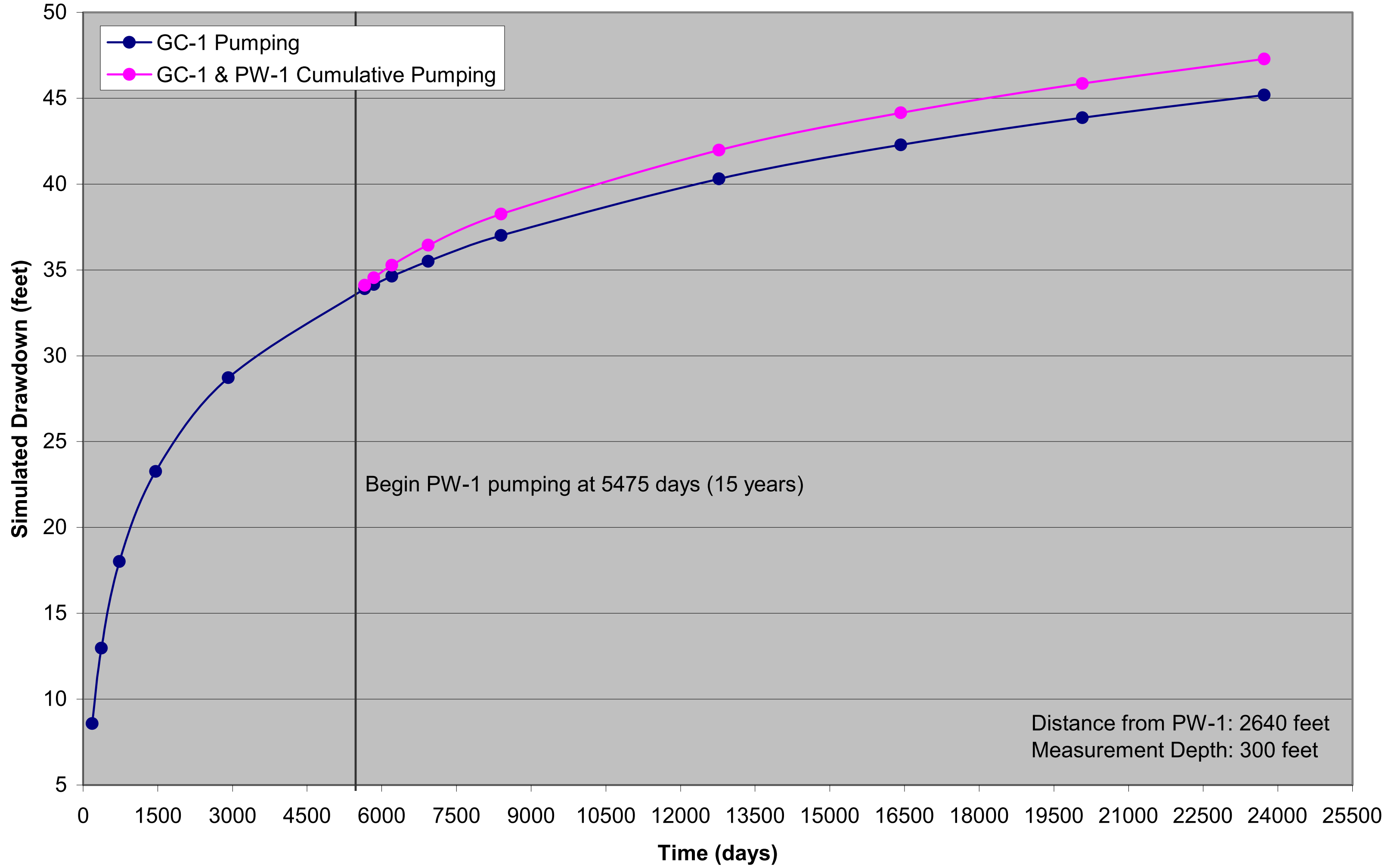


Figure B-6

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-3300

WEST YOST ASSOCIATES
Consulting Engineers

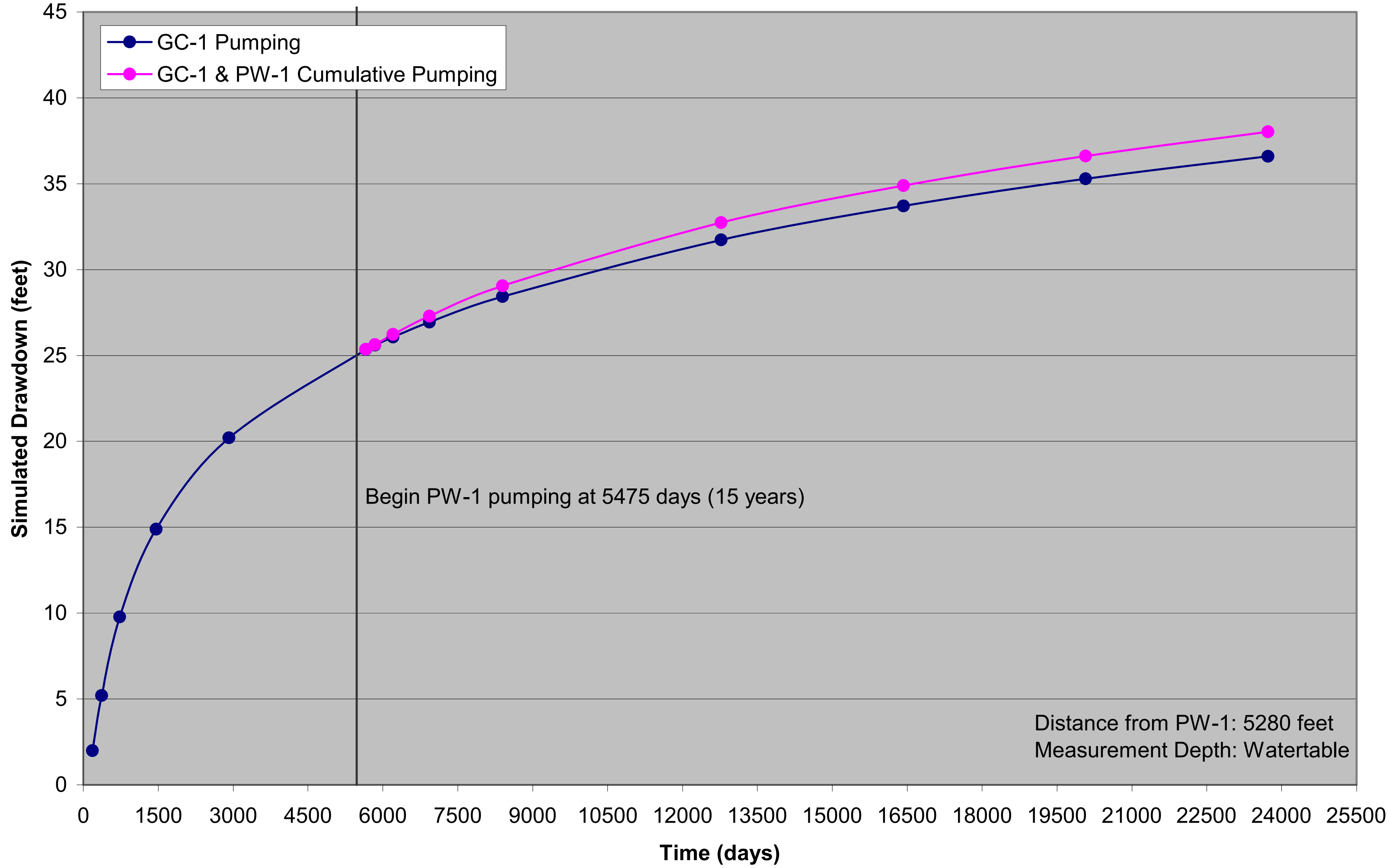


Figure B-7

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-4000

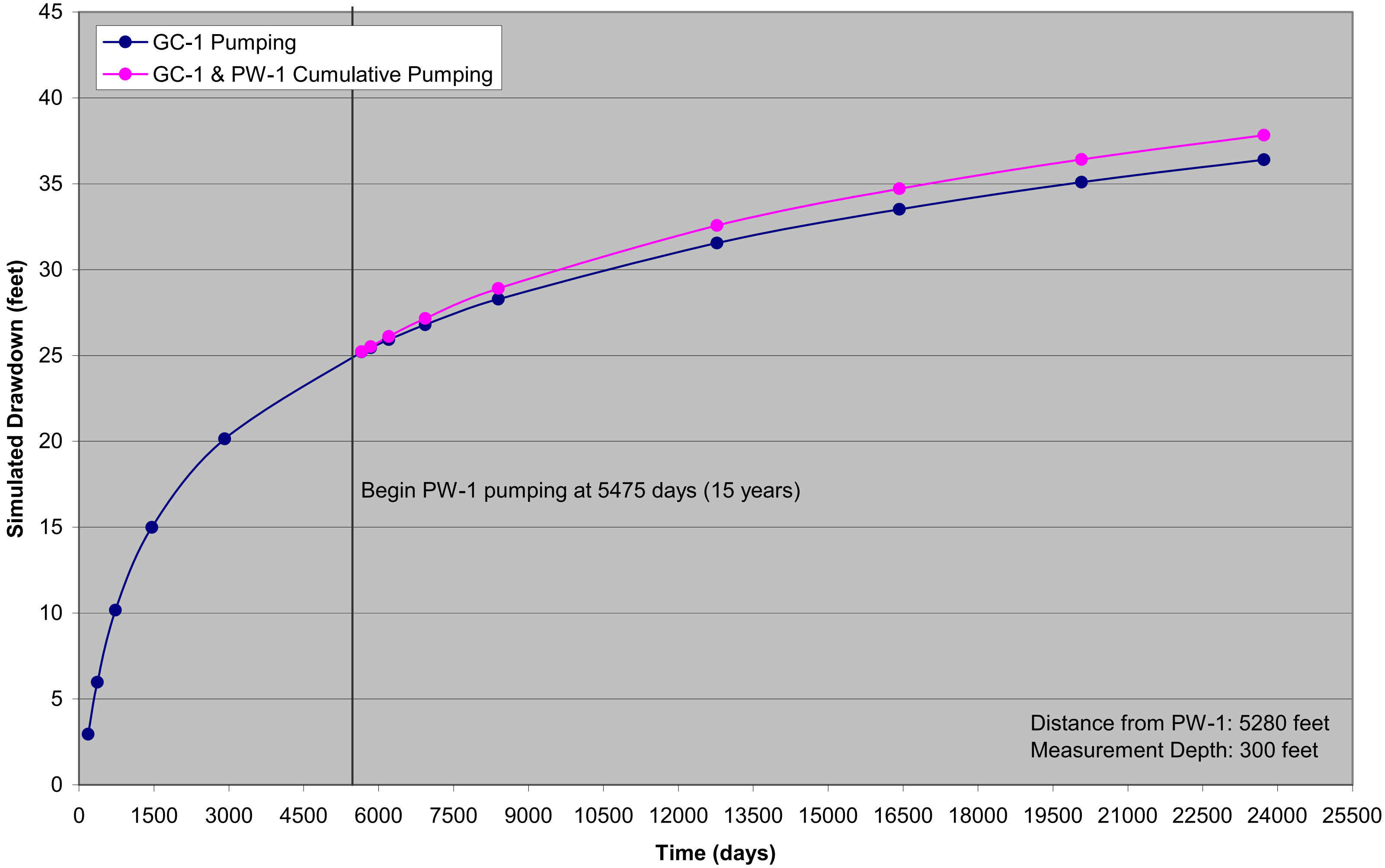


Figure B-8

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-4300

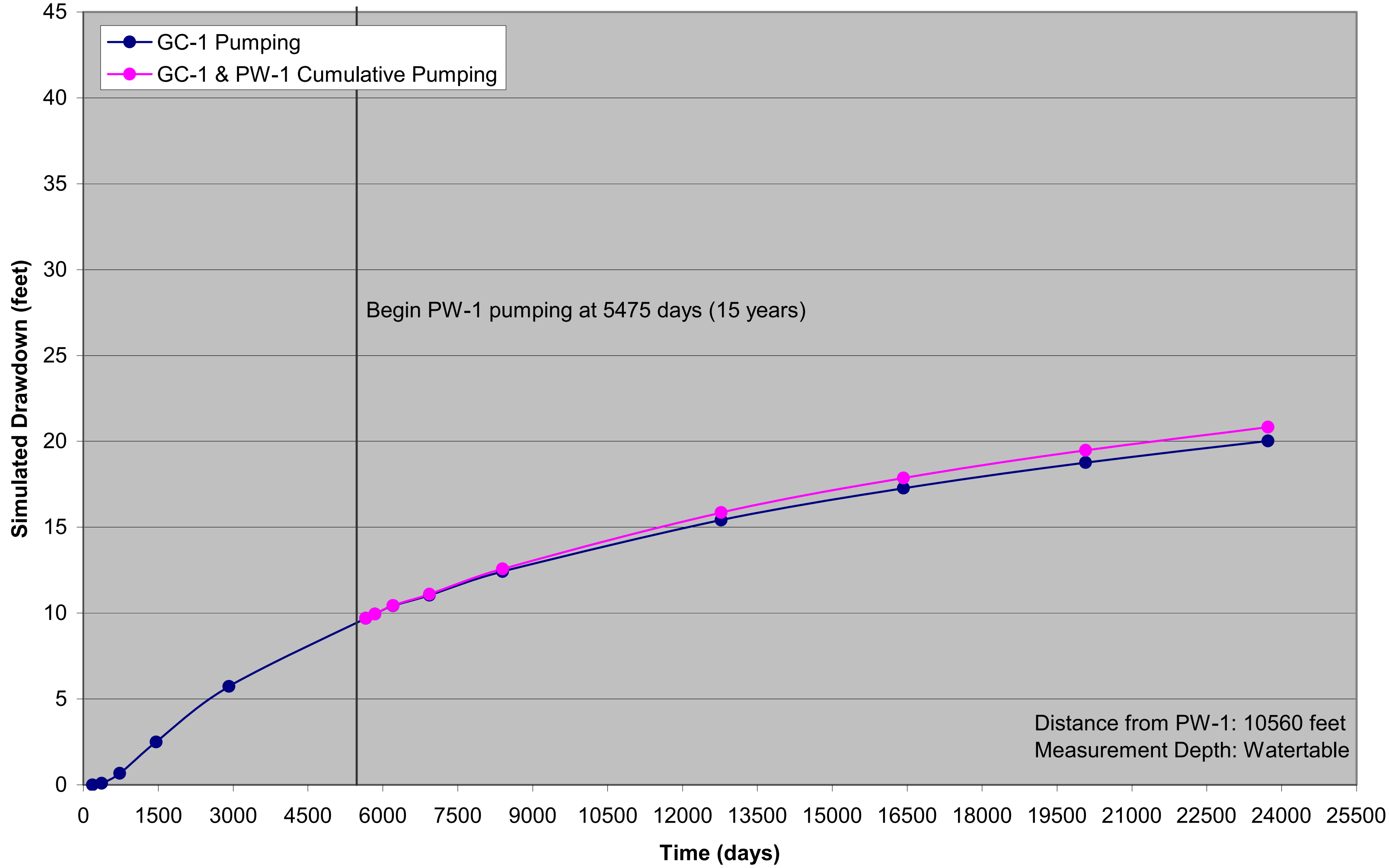


Figure B-9

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-5000

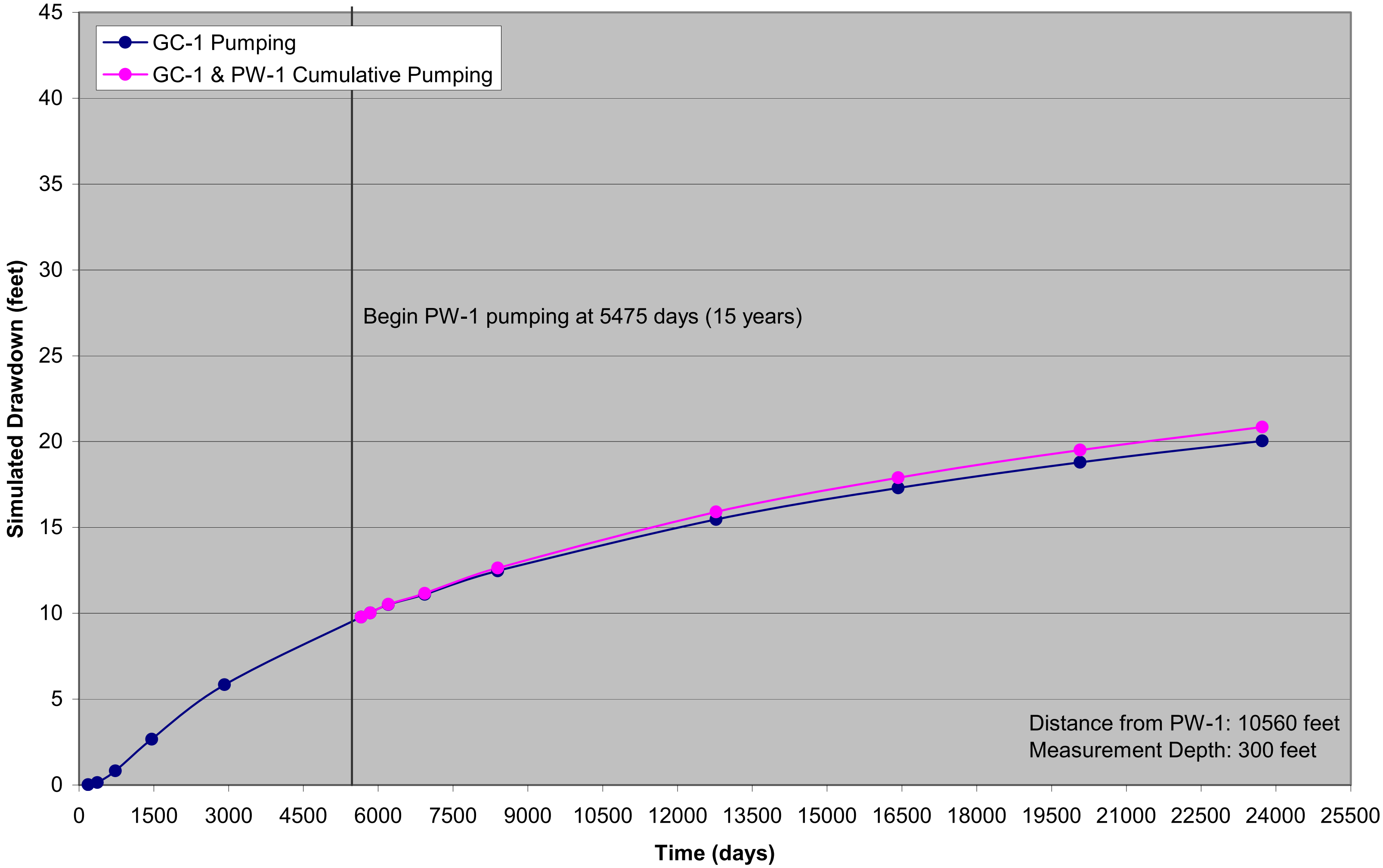


Figure B-10

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-5300

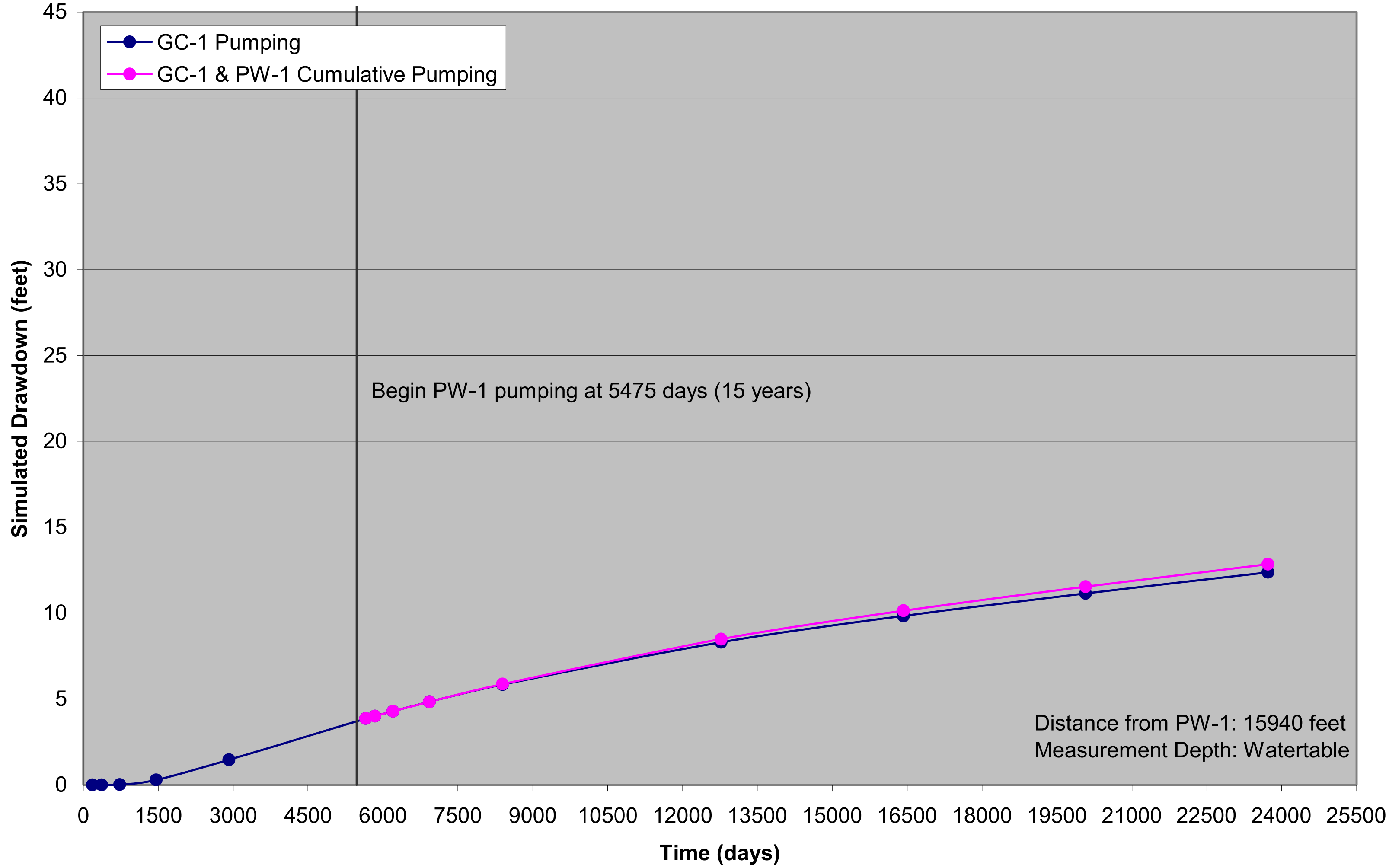


Figure B-11

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-6000

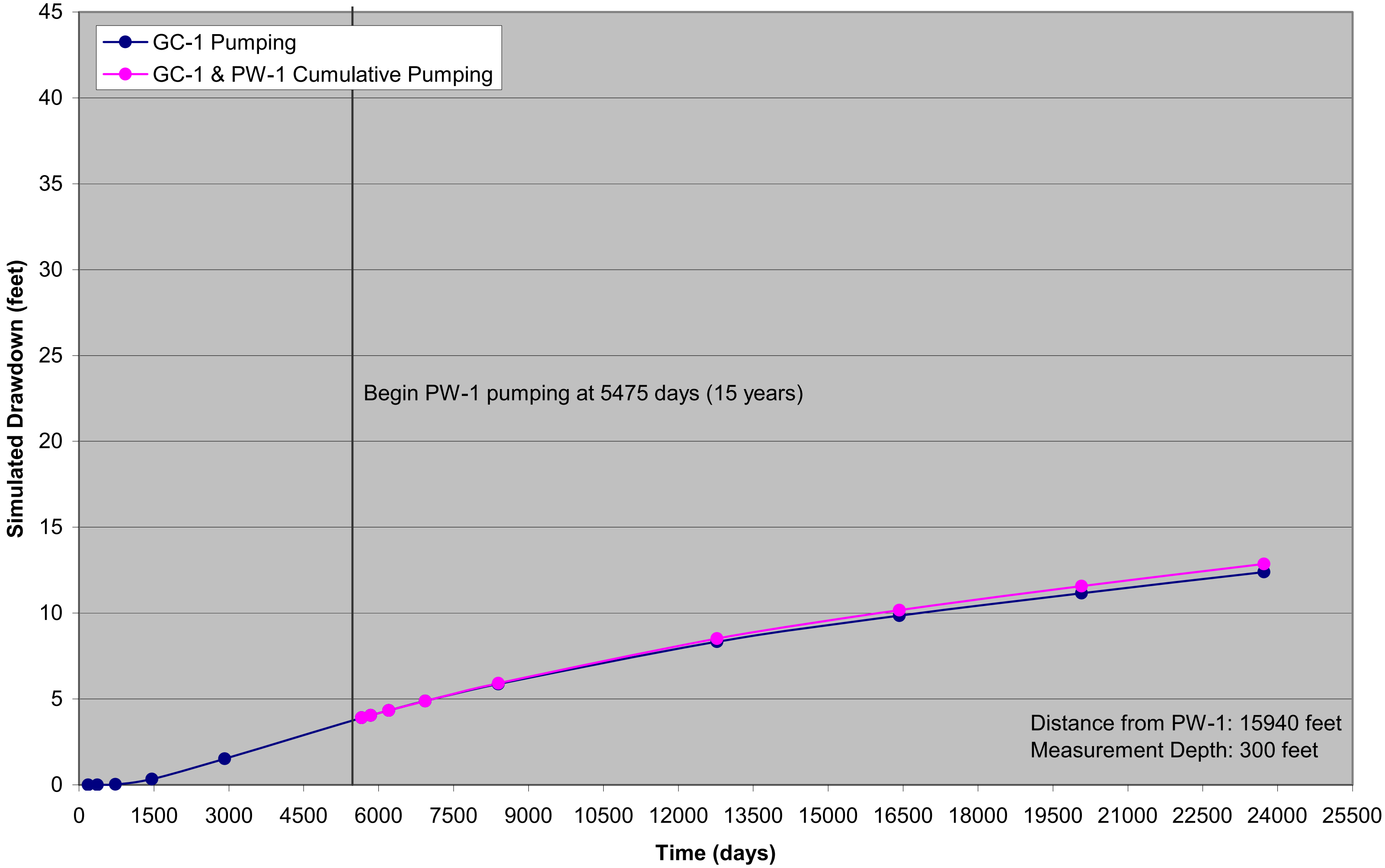


Figure B-12

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-6300

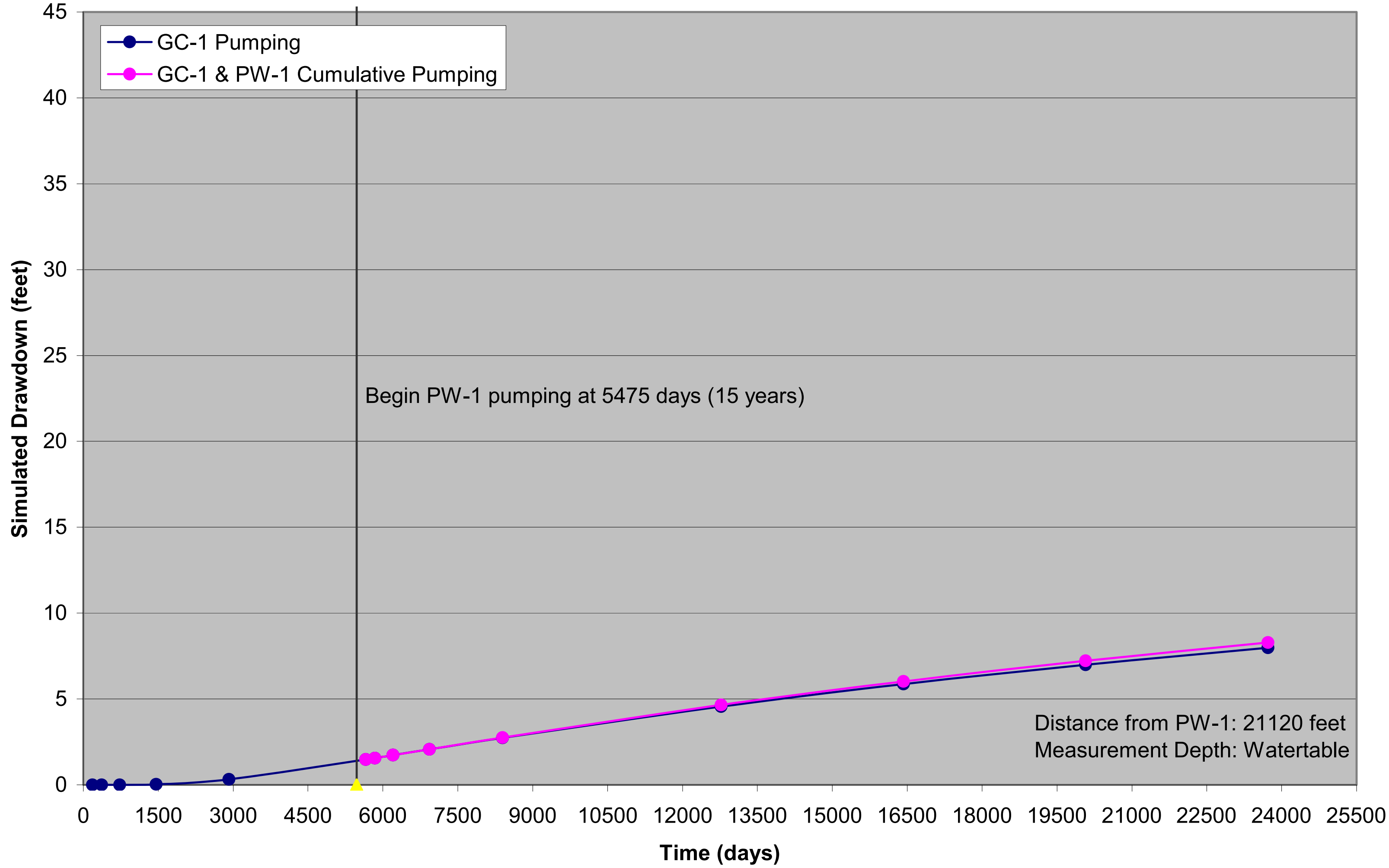


Figure B-13

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-7000

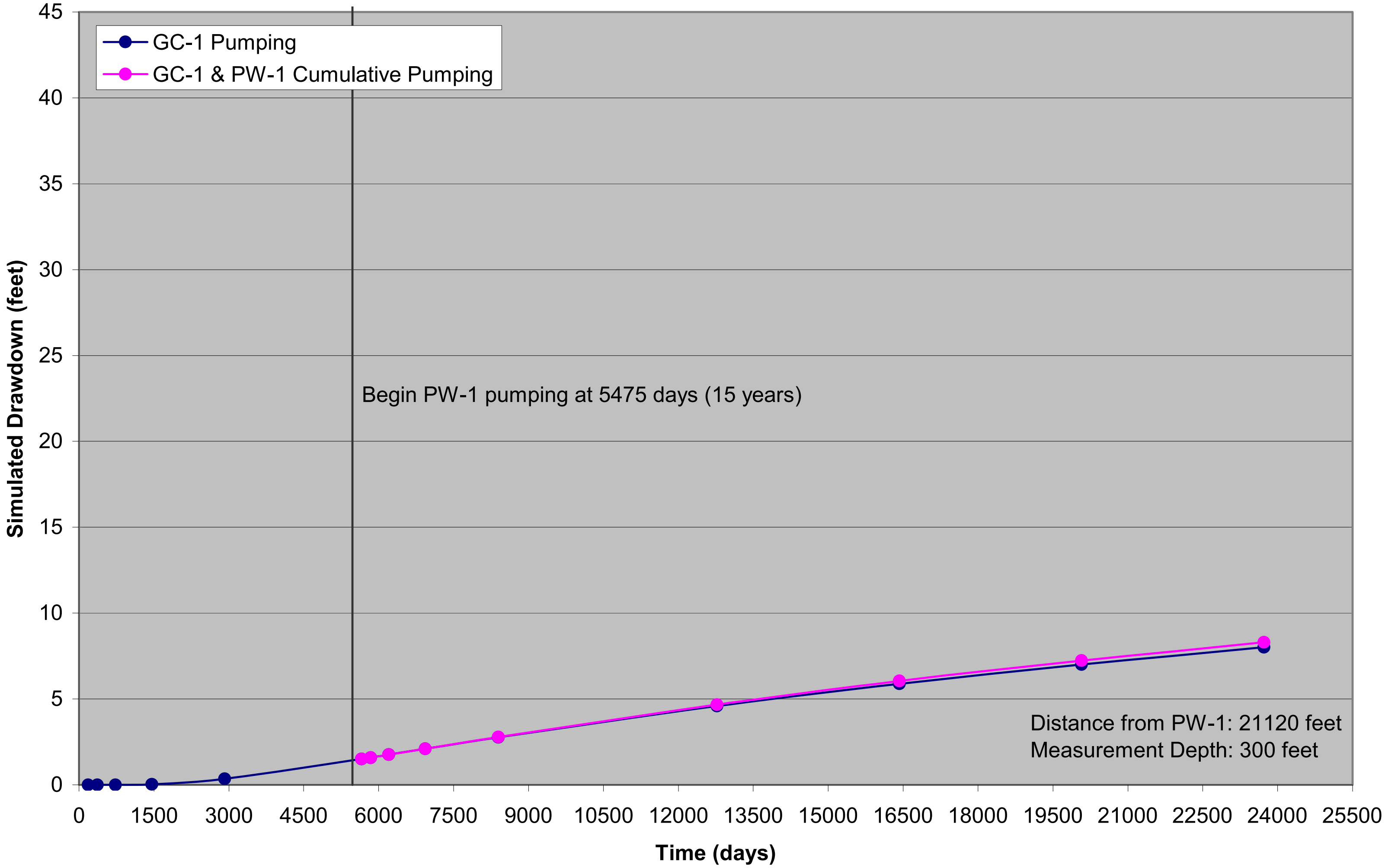


Figure B-14

BrightSource Energy
Ivanpah Solar Electric Generating System

SIMULATED DRAWDOWN AT MW-7300

Waste Management (111i)

Background

The project proposes discharging secondarily treated wastewater from package treatment systems to the power plant landscaping. There will be a package treatment system associated with each of the three heliostats proposed and a larger package treatment system at the administration building area.

Data Request

111. Please develop and submit a draft Wastewater Discharge Plan for the smaller heliostat package treatment systems and the larger administration building package treatment system. This Plan should include but not be limited to:

i) a detailed discussion of how the wastewater discharge from each package treatment system would comply with California Title 22 wastewater discharge requirements.

Response: On January 15, 2009, following the January 9, 2009, PSA workshop held in Primm, Tom Hurshman (BLM's Project Manager) provided the Applicant with a list of documents that BLM needed in order to prepare its Environmental Impact Statement. Included on that list is the requirement that "Lahontan RWQCB needs to receive permit application(s) for the package sanitary wastewater treatment system and permit(s) for the surface discharge of Title 22 Wastewater related to the use of secondary treated wastewater for landscape irrigation." In response to that table and this data request, the Applicant has prepared a Report of Waste Discharge permit application for the Administration/warehouse building. It is included as Attachment DR111-1A. According to the latest project description (see Attachment DR130-2B, Data Response Set 2I), porta potties will be used at the power blocks.

ATTACHMENT DR111-1A

Report of Waste Discharge Permit Application

BrightSource™

May 27, 2007

Mike Plaziak, Supervising Engineer
Lahontan Regional Water Quality Control Board
14440 Civic Dr., Suite 200
Victorville, CA 92392

RE: Waste Discharge Requirements Permit Application, Ivanpah Solar Electric Generating System Administration Building Package Wastewater Treatment Plant

Dear Mr. Plaziak:

Attached please find an application for coverage under General Waste Discharge Requirements for Discharges to Land by Small Domestic Wastewater Treatment Systems (Order No. 97-10-DWQ). The application includes a description of the proposed wastewater treatment facilities for the BrightSource Energy Ivanpah Administration Building. Additional information for your consideration includes a Vicinity Map, Site Map, and Block Layout. A check in the amount of $2,759.40 is enclosed for the application fee consistent with Waste Discharge Fees required pursuant to Resolution 2008-0073.

Should you have any questions or require further information, please call Steve De Young, Brightsource Energy at (925) 890-9714.

Sincerely,

Steve De Young
Director
Environmental, Health and Safety

7551

BrightSource Energy, Inc.
(510) 550-8161
1999 Harrison Street, Suite 2150
Oakland, CA 94612

WELLS FARGO BANK, N.A.
11-24-1210

5/27/2009

Security features. Details on back.

PAY TO THE ORDER OF Lahonton Regional Water Qty Control Board $ **2,759.40

Two Thousand Seven Hundred Fifty-Nine and 40/100** DOLLARS

Lahonton Regional Water Qty Control Board
200
14440 Civic Drive
Victorville, CA 92392

MEMO Application for Report of Waste Discharge

AUTHORIZED SIGNATURE

881064 / 04-08

⑈007551⑈ ⑆121000248⑆4121436612⑈

BRIGHTSOURCE ENERGY, INC. 7551

Lahonton Regional Water Qty Control Board 5/27/2009

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
5/26/2009	Bill	Ckreq052609	2,759.40	2,759.40		2,759.40
					Check Amount	2,759.40

Wells Fargo Bank-612 Application for Report of Waste Discharge 2,759.40

ATTACHMENT DR111-1A

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE GENERAL INFORMATION FORM FOR WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

I. FACILITY INFORMATION

A. Facility:

Name: Ivanpah Solar Electric Generating System Administration Building			
Address: Colosseum Rd. (to be determined)			
City: Ivanpah Valley	County: San Bernardinc	State: CA	Zip Code: no mailing address yet
Contact Person: Steve De Young		Telephone Number: (925) 890-9714	

B. Facility Owner:

Name: Solar Partners IV			Owner Type (Check One) 1. ☐ Individual 2. ☑ Corporation
Address: 1999 Harrison St., Suite 2150			3. ☐ Governmental Agency 4. ☐ Partnership
City: Oakland	State: CA	Zip Code: 94612	5. ☐ Other:
Contact Person: Steve De Young		Telephone Number: (925) 890-9714	Federal Tax ID: 36-4608154

C. Facility Operator (The agency or business, not the person):

Name: BrightSource Energy, Inc.			Operator Type (Check One) 1. ☐ Individual 2. ☑ Corporation
Address: 1999 Harrison St., Suite 2150			3. ☐ Governmental Agency 4. ☐ Partnership
City: Oakland	State: CA	Zip Code: 94612	5. ☐ Other:
Contact Person: Steve De Young		Telephone Number: (925) 890-9714	

D. Owner of the Land:

Name: Bureau of Land Management, Needles Field Office			Owner Type (Check One) 1. ☐ Individual 2. ☐ Corporation
Address: 1303 South Hwy 95			3. ☑ Governmental Agency 4. ☐ Partnership
City: Needles	State: CA	Zip Code: 92363	5. ☐ Other:
Contact Person: Raymond C. Lee		Telephone Number: 760-326-7000	

E. Address Where Legal Notice May Be Served:

Address: 1999 Harrison St., Suite 2150		
City: Oakland	State: CA	Zip Code: 94612
Contact Person: Steve De Young		Telephone Number: (925) 890-9714

F. Billing Address:

Address: 1999 Harrison St., Suite 2150		
City: Oakland	State: CA	Zip Code: 94612
Contact Person: Steve De Young		Telephone Number: (925) 890-9714

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board
APPLICATION/REPORT OF WASTE DISCHARGE
GENERAL INFORMATION FORM FOR
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

Attachment 1

VI. OTHER REQUIRED INFORMATION

Please provide a COMPLETE characterization of your discharge. A complete characterization includes, but is not limited to, design and actual flows, a list of constituents and the discharge concentration of each constituent, a list of other appropriate waste discharge characteristics, a description and schematic drawing of all treatment processes, a description of any Best Management Practices (BMPs) used, and a description of disposal methods.

Also include a site map showing the location of the facility and, if you are submitting this application for an NPDES permit, identify the surface water to which you propose to discharge. Please try to limit your maps to a scale of 1:24,000 (7.5' USGS Quadrangle) or a street map, if more appropriate.

VII. OTHER

Attach additional sheets to explain any responses which need clarification. List attachments with titles and dates below:

Attachment 1

You will be notified by a representative of the RWQCB within 30 days of receipt of your application. The notice will state if your application is complete or if there is additional information you must submit to complete your Application/Report of Waste Discharge, pursuant to Division 7, Section 13260 of the California Water Code.

VIII. CERTIFICATION

"I certify under penalty of law that this document, including all attachments and supplemental information, were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Print Name: S. A. De Young Title: Director, ES&H

Signature: [signature] Date: May 27, 2009

FOR OFFICE USE ONLY

Date Form 200 Received:	Letter to Discharger:	Fee Amount Received:	Check #:

Attachment 1
BrightSource Energy/Solar Partners IV
Ivanpah Administration Building

Introduction

Solar Partners I, LLC; Solar Partners II, LLC; Solar Partners VIII, LLC, the owners of the three separate solar plant sites, and Solar Partners IV, LLC, the owner of shared facilities required by the three solar plant sites propose to develop a solar facility (together referred to as the Ivanaph Solar Electric Generating System, or Ivanaph SEGS). BrightSource Energy Inc. (BrightSource), a Delaware corporation, is a technology and development company, and the parent company of the Solar Partners entities. They have submitted an application to the California Energy Commission (CEC) to construct and operate three solar facilities in the Mojave Desert (see Figure 1 for vicinity) in accordance with the Warren-Alquist Act. The additional information provided herein is specific to the Administration Building/ Operation and Maintenance area that will provide centralized administrative services to the Ivanpah facilities. A package wastewater treatment plant would be operated at the administration site, located between Ivanpah 1 and 2 (see Figure 2). Each solar generation facility site will incorporate additional standalone wastewater treatment facilities.

The purpose of this attachment is to provide the additional information required for the Solar Partners IV, LLC Report of Waste Discharge application submitted by BrightSource Energy, Inc to the Lahontan Regional Water Quality Control Board (Regional Water Board). The reason for submitting the Report of Waste Discharge is to provide information for coverage under State Water Resources Control Board Water Quality Order No. 97-10-DWQ General Waste Discharge Requirements for Discharges to Land by Small Domestic Wastewater Treatment Systems (General WDR). The onsite package wastewater treatment plant will provide domestic wastewater disposal for the Ivanpah administration site.

Description of Proposed Wastewater Treatment Facilities

The shared portion of the project site (to be owned by Solar Partners IV, LLC) is the Administrative Building/Operations and Maintenance area for the Ivanpah SEGS and provides the main administrative services at this facility for three separate solar plants: Ivanpah 1, Ivanpah 2, and Ivanpah 3. The wastewater treatment system is an onsite package plant that will receive and process domestic wastewater including restroom toilets, showers, and sinks. Back-up power to allow the wastewater treatment system to continue to operate during a power outage will be provided by an onsite generator. The facility will be located within the proposed common area footprint (see Figure 3) and adequate measures will be taken to ensure that flood or surface drainage waters do not erode or otherwise damage the wastewater treatment facilities.

The administrative facility will serve up to 31 full-time employees, as well as outlying facility staff on a discontinuous basis as needed. The Ivanpah 1, Ivanpah 2, and Ivanpah 3 facilities will have their own onsite wastewater treatment facilities.

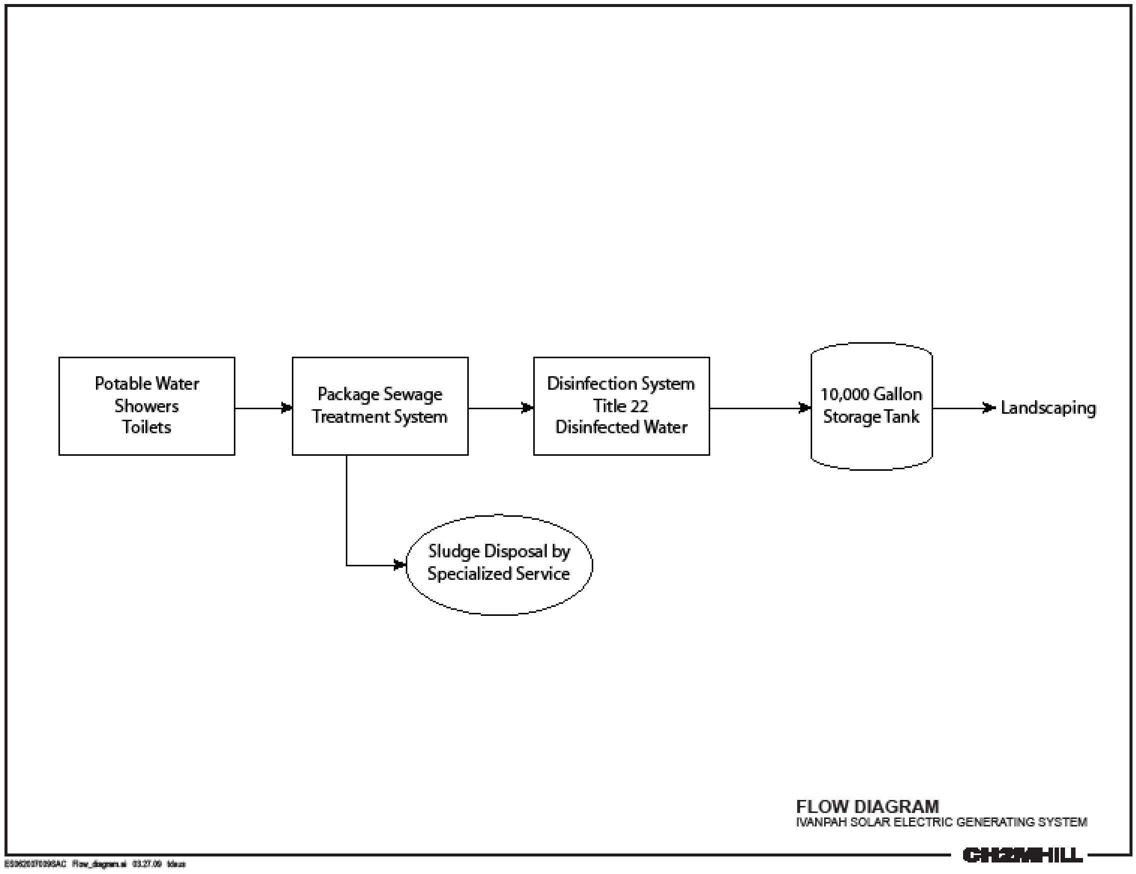
TABLE 1 - DESIGN VOLUME
Ivanpah Administration Facility

Staff	Shifts	Total FTE equivalent per day
3 General Managers	1	3
8 Administrative	1	8
10 Intermittent site visits from outlying facility staff	2	20
Total FTE Equivalent		**31**

Notes:
Flow Assumption: 20 gallons per person per shift (12-hour shifts)
Gallons per day: 620
Rated Capacity of System: 1,500 gallons per day

Flow types into the plant include domestic wastewater. The treatment plant effluent will be disinfected via sodium hypochlorite injection and discharged to a 10,000-gallon fiberglass storage tank. Secondary-treated wastewater will be processed to meet appropriate California Code of Regulations Title 22 standards (§60304 Use of Recycled Water for Irrigation) for application to onsite non-edible landscaping. The facility is not accessible to the general public. During periods where landscape watering is infeasible, the treated wastewater effluent storage tank liquids will be hauled offsite by a licensed septic hauler and disposed of properly at an authorized offsite receiving facility. Further, information on wastewater management is provided in the Liquid Waste Management section below.

The wastewater treatment and recycling package plant process is an aerated system providing secondary treatment contained in a fiberglass tank. Processing includes aeration, transfer/settling chamber, and discharge to a holding tank as shown in the flow diagram below. The treatment process described is for a Cromaglass Wastewater Treatment System or equivalent. Influent flow enters a solids retention compartment that is separated by a non-corrosive screen. Inorganic solids are retained behind the screen. Organic solids are broken by turbulence created with mixed liquor forced through a screen by submersible aeration pumps. Liquid and small organic solids pass through the screen into a continuing aeration section. Air and mixing are provided by submersible pumps with venturi aspirators that receive air through an intake pipe from the atmosphere. Treated mixed liquor is transferred by pumping to the clarification section. The transfer period overfills the clarifier with the excess spilling through overflow weirs back into the main aeration section. Transfer ceases and clarifier isolated solids separation occurs under quiescent conditions. After settling, the effluent is pumped out of the clarifier for disinfection then discharged to a holding tank that will also serve as the chlorine contact area. Chlorine contact time will be at least 2-hours and effluent will meet appropriate Title 22 requirements for landscape irrigation. Sludge is returned from the bottom of the clarifier back into the main aeration section using a submersible pump. Sludge will be hauled offsite by a licensed septic hauler and disposed of properly at an authorized offsite receiving facility.



Liquid Waste Management

Facilities producing residual water or wastewater will process it in the following manner.

Water Treatment

The main water treatment subsystems will be supplied by a water treatment specialty company, and will include the following component.

Granular Activated Carbon Filters

The granular activated carbon (GAC) filters will be periodically replaced by the treatment company and backwashed offsite.

Wastewater Collection, Treatment, and Disposal

The Administration site will include a small package sewage system for domestic wastewater streams, including showers and toilet. To the extent practical, process wastewater will be recycled and reused. When needed, sewage sludge will be removed from site by a sanitary service. Treated wastewater from the package sewage treatment plant will be used to maintain local landscaping.

Sanitary Facilities

The site will accommodate staff hygienic needs including toilets and showers. The domestic wastewater will be routed to, and be processed by, the package wastewater treatment plant.

Wastewater Flows and Effluent Characteristics

The General WDR does not specify discharge concentrations for package wastewater treatment plants. The limits may be established specific to the proposed package wastewater treatment plant by the Lahontan Regional Water Quality Control Board when the facility Waste Discharge Requirements are approved. Only domestic wastewater treatment and disposal systems with a maximum average daily flow of 20,000 gallons or less that discharge to land are eligible for coverage under the General WDRs. The projected flow into the wastewater treatment system will be approximately 700 gallons per day.

Effluent characteristics will be typical secondary effluent. The constituents that are anticipated to be required for effluent monitoring include pH, 20˚C BOD_5, nitrate as N, total nitrogen, total suspended solids, and total coliform. Effluent used for landscape irrigation will meet appropriate Title 22 standards anticipated to be established in the Waste Discharge Monitoring and Reporting Program Requirements issued by the Lahontan Regional Water Quality Control Board.

Solids Disposal

If collected screenings, sludges, and other solids removed from liquid wastes are disposed of at a landfill, such disposal will comply with California Code of Regulations, Title 23, Section 2510, et seq. (Chapter 15).

Inorganic solids are separated by a screen in the package plant, contained in a covered waste receptacle and hauled offsite for proper disposal at a local facility. Several solid waste non-exclusive franchise services provide garbage collection services for the project site area. Local disposal facilities include the Sloan Transfer Station (Sloan NV), Apex Regional Landfill (Las Vegas, NV), and the Barstow Sanitary Landfill (Barstow, CA).

Sludge will be removed from the site by a licensed sanitary service provider for proper offsite disposal to a sewage treatment facility.

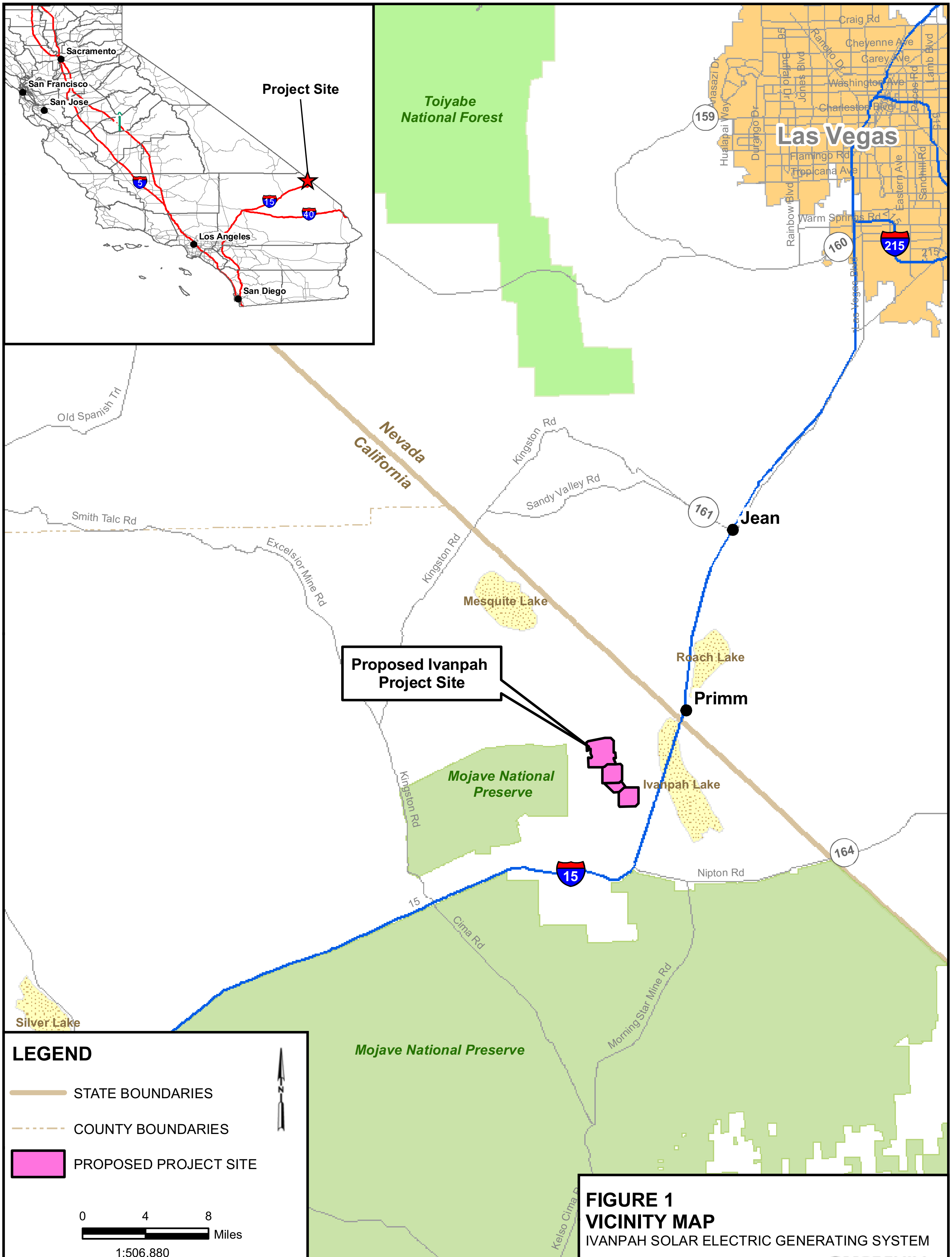


FIGURE 1
VICINITY MAP
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

SAC \\ZION\SACGIS\PROJ\352897_IVANPAH\MAPFILES\FIGURE2_VICINITY_MAP.MXD KMORGAN 3/25/2009 09:49:25

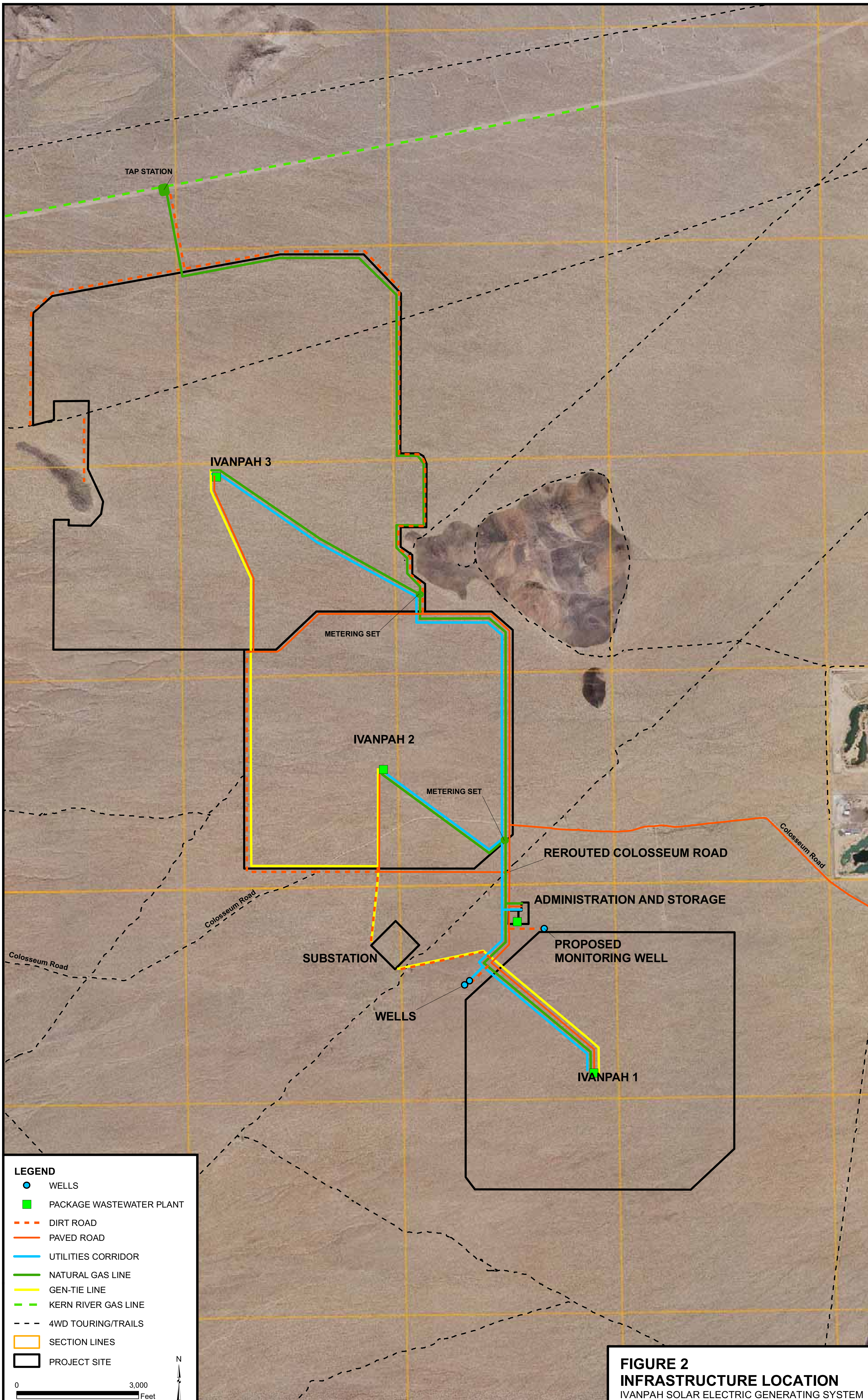


FIGURE 2
INFRASTRUCTURE LOCATION
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

CH2MHILL

\\ZION\SACGIS\PROJ\352897_IVANPAH\MAPFILES\2008FIELDMAPS\FIG2_INFRASTRUCTURELOCATION.MXD SSCOPES 4/7/2009 14:41:35

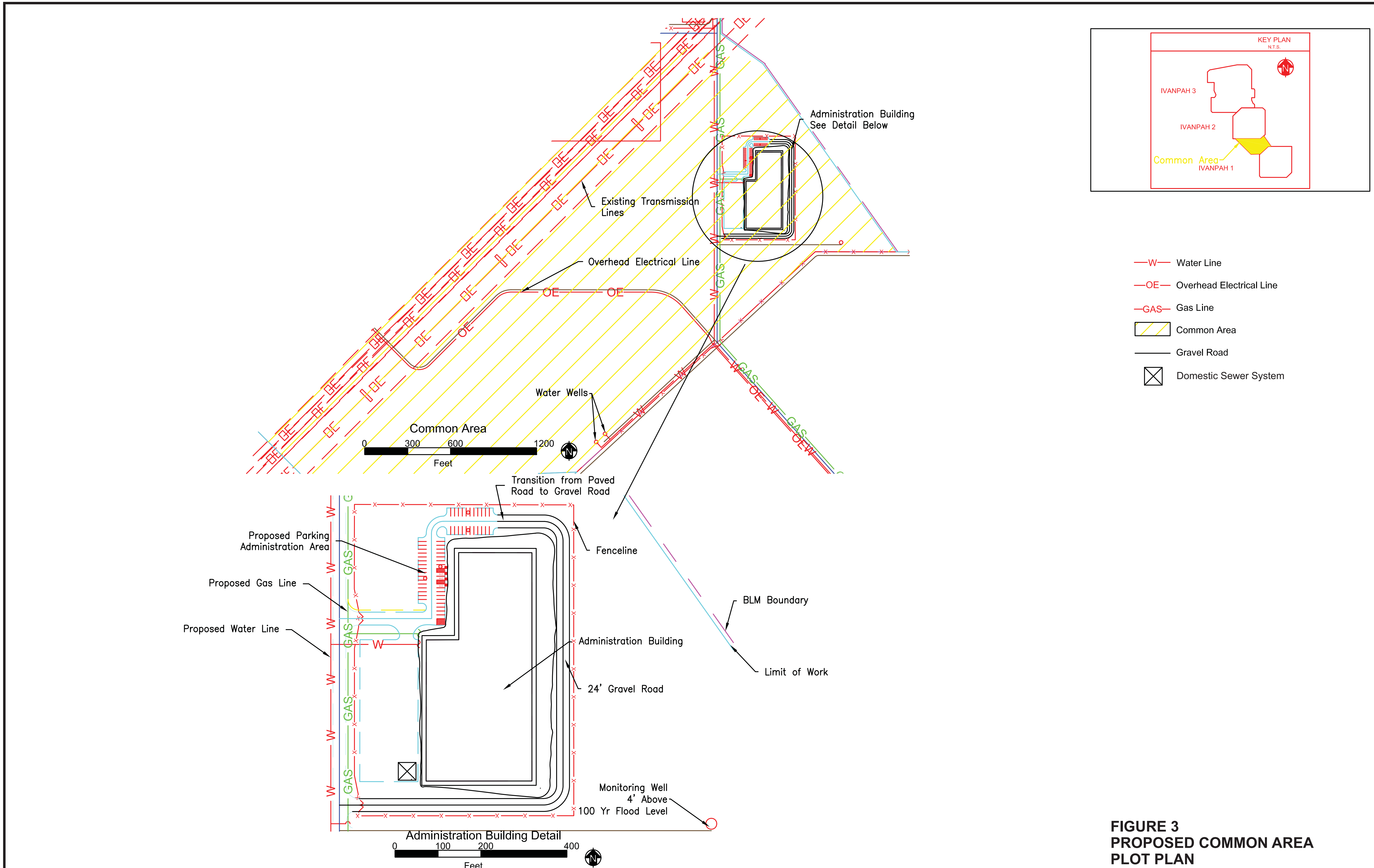


FIGURE 3
PROPOSED COMMON AREA PLOT PLAN
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

Source: Tetra Tech, Inc., March 23, 2009

CH2MHILL

ES062007009SAC Figure_3.ai 04.01.09 tdaus

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE *IVANPAH SOLAR ELECTRIC GENERATING SYSTEM*

DOCKET NO. 07-AFC-5

PROOF OF SERVICE
(Revised 4/16/09)

APPLICANT

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Oakland, CA 94612

Steve De Young, Director
Project Manager
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E-MAILED PREFERRED

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Elena Miller
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publicadviser@energy.state.ca.us

DECLARATION OF SERVICE

I, Mary Finn, declare that on May 27, 2009, I served and filed copies of the attached Data Response Set 1K. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:
[www.energy.ca.gov/sitingcases/ivanpah]. The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

FOR SERVICE TO ALL OTHER PARTIES:

__**x**__ sent electronically to all email addresses on the Proof of Service list;

__**x**__ by personal delivery or by depositing in the United States mail at Sacramento, CA with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

__**x**__ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

OR

_____depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 07-AFC-5
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Mary Finn