HOMESTAKE
Grants Project

Homestake Mining Company of California

Jesse R. Toepfer
Closure Manager

31 December 2014

Mr. David Mayerson
New Mexico Environment Department
Ground Water Pollution Prevention Section
P.O. Box 26110
Santa Fe, New Mexico 87502

Re: Land Application Area Closure Plan

Dear Mr. Mayerson:

Attached please find the Closure Plan for the Land Application Areas at Homestake Mining Company of California's (Homestake) Grants Reclamation Project. This Closure Plan is submitted as required by Condition 56 of Homestake's Discharge Plan (DP-200).

Please be aware that the US Environmental Protection Agency (EPA) is currently conducting a Remedial Investigation / Feasibility Study (RI/FS) for Homestake's Grants Reclamation Project. One or more portions of the RI/FS may address closure of the Land Application Areas discussed in the enclosed report. In the event of a conflict between what is set forth in the enclosed report and what is given in the RI/FS, the information set forth in the RI/FS shall prevail. Furthermore, the US Nuclear Regulatory Commission (NRC) is currently reviewing a Corrective Action Program (CAP) for Homestake's Grants Reclamation Project. Even though the Land Application Areas are outside of the NRC-licensed boundary of the site, the NRC is the lead regulatory agency in charge of the reclamation and remediation activities at the site. In the event of a conflict between what is set forth in the enclosed report and what is required by NRC, the requirements of NRC shall prevail.

The land application program ended after 2012, and in anticipation of development of this closure plan, the irrigation data through late 2014 including soil data and lysimeter data were compiled and are included as an attachment to the Closure Plan.

If you have any questions regarding this submittal, I can be reached 505-287-4456 ext. 34 or via cell phone 505.290.3067.

Respectfully,

JRT kp

Jesse R. Toepfer
Closure Manager
HOMESTAKE MINING COMPANY OF CALIFORNIA

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HOMESTAKE MINING COMPANY OF CALIFORNIA

Grants Reclamation Project

Closure Plan for Land Application Areas

Submitted On:
December 2014

Submitted To:
New Mexico Environmental Department
Nuclear Regulatory Commission

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List of Acronyms and Abbreviations

ac-ft	Acre-feet (typically used for volume of water)
COC	Constituent(s) of Concern
DAF	dilution attenuation factor
EC	Electrical Conductivity
gpm	gallon(s) per minute
GRP	Grants Reclamation Project
HMC	Homestake Mining Company
NMED	New Mexico Environment Department
NRC	Nuclear Regulatory Commission
mg/l	milligram per liter
RML	Radioactive Materials License
SAR	Sodium Adsorption Ratio
SSLs	Soil Screening Levels
$\mu℧$ /cm	micro mhos per centimeter

Executive Summary

This report presents the plan for the closure of the four irrigated fields supplied from ground water with modestly elevated levels of uranium and selenium. Following closure, the irrigation areas can be returned to previous land uses or such other uses as may be prescribed by deed restrictions and/or covenants. Please be aware that the US Environmental Protection Agency (EPA) is currently conducting a Remedial Investigation / Feasibility Study (RI/FS) for Homestake's Grants Reclamation Project. One or more portions of the RI/FS may address closure of the Land Application Areas discussed in this report or the attachments hereto. In the event of a conflict between what is set forth herein and what is given in the RI/FS, the information set forth in the RI/FS shall prevail. Furthermore, the US Nuclear Regulatory Commission (NRC) is currently reviewing a Corrective Action Program (CAP) for Homestake's Grants Reclamation Project. Even though the Land Application Areas are outside of the NRC-licensed boundary of the site, the NRC is the lead regulatory agency in charge of the reclamation and remediation activities at the site. In the event of a conflict between what is set forth in this report or the attachments hereto and what is required by NRC, the requirements of NRC shall prevail.

The land application was used by Homestake Mining Company of California (HMC) as part of the Homestake Grants Reclamation Project (GRP). The project plan established an upper limit for the uranium concentration in irrigation water at the U.S. Nuclear Regulatory Commission effluent standard of 0.44 milligrams per liter (mg/l). Selenium was set at a site-specific State of New Mexico Water Quality Control Commission standard of 0.12 mg/l. These limits were reduced during the 2010 through 2012 limited irrigation. From 2000 through 2012, between 100 and 394 acres were irrigated with this water. Uranium and selenium concentrations have been measured in the applied irrigation water and affected soils each year since 2000.

The fields subject to irrigation are located in Sections 28, 33, and 34 in Township 12 North, Range 10 West near Grants, New Mexico. Figure 1-1 shows the locations of the four irrigation fields. Fields in Sections 28 and 33 were irrigated using a center pivot irrigation system. The field in Section 34 and an additional portion of Section 33 was irrigated by flooding. The total amount of irrigation water applied to the fields from 2000 to 2012 was 9,551 acre feet (ac-ft), ranging from 201 to 1,054 ac-ft annually.

The uranium and selenium concentrations in the soil were measured annually to define the increases in these constituents from the land application. Lysimeters were installed within the soil profile in irrigation areas in Sections 28, 33 and 34 and were sampled to evaluate constituent of concern (COC) concentration in soil moisture. Sampling of the lysimeters has revealed that most of the mass of uranium and selenium applied to the fields is retained within the upper ten feet of the soil profile.

Less than one percent of the mass of uranium and selenium applied to the fields to date has been detected in samples of vegetation and hay. Selenium uptake in hay is below the recommended upper limit of 2.0 mg/kg for animal feed presented in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014).

In terms of risk to human health, uranium levels are acceptable. The dose to man by way of the ingestion of beef is negligible, as indicated by food web uptake calculations presented in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014).

Potential radiation doses to the public were evaluated for:

- Residents eating beef that were fed hay grown on the irrigated areas.
- An assumed resident farmer, living on and farming the Section 34 irrigated area.
- Current residents living near the irrigated areas of Sections 28 and 33 during crop irrigation activities.

Each analysis shows that the radiological dose to existing or future occupants of the land on and near the irrigation areas is extremely small (less than one percent) compared to the average dose that the population receives from natural background and medical exposures.

1. INTRODUCTION AND IRRIGATION HISTORY

Four fields have been irrigated with water containing elevated concentrations of uranium and selenium. Figure 1-1 shows the locations of the four irrigation fields. Ground water from wells in the Off-Site areas adjacent to the Grants Reclamation Project (GRP) was applied to the irrigation fields. No On-Site water was applied to the irrigation fields. The irrigation was applied to the Section 33 pivot (150 acres) during the 2000 through 2009 growing seasons, Section 34 flood (120 acres) during the 2000 through 2010 and 2012 and to a field in Section 28 (60 acres) during the 2002, 2003 and 2004 growing seasons. The field in Section 28 was expanded to 100 acres prior to the 2005 season and irrigated from 2005 to 2009 and in 2011 and 2012. Only the Section 34 area was irrigated in 2010 and the Section 28 area was the only one irrigated in 2011. Only the Section 28 and 34 fields were irrigated in 2012. No irrigation was done in 2013 or 2014. Fields in Sections 33 and 28 were irrigated using a center pivot irrigation system, whereas the field in Section 34 was irrigated by flooding. An additional 24 acres were flood irrigated in Section 33 in 2004, 2005, 2008 and 2009, but not in 2006 and 2007. All sections discussed in this report are located in Township 12 North, Range 10 West.

Uranium and selenium concentrations were measured in the applied irrigation water, affected soils (see Figure 1-1 for water application locations) and vegetation to evaluate the potential impacts from the irrigation program.

The remainder of this report is organized as follows:

- Section 2 presents a summary of baseline characterization and past monitoring during irrigation.
- Section 3 presents description of the closure measures.
- Section 4 presents post closure land use.
- Section 5 presents the monitoring plans.
- Sections 6 and 7 present the conclusions and references, respectively.

1.1 Sections 33 and 34

A common pipe connecting the southern irrigation supply wells was used for both Sections 33 and 34 irrigation areas. Water samples collected at the end of the pipeline at the flood outlet or center pivot are composite samples from the group of supply wells. Table 1-1 presents the yearly average concentrations of uranium, selenium, total dissolved solids (TDS), sulfate, molybdenum and chloride observed in the 2000-2012 irrigation water for Sections 33 and 34. Concentrations of other site constituents of concern (COCs) such as Ra-226, Ra-228, vanadium and Th-230 were very small and only a limited number of supply water samples were analyzed for the minor COCs. A tabulation of supply well water quality data is included in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014).

Average uranium and selenium concentrations were approximately 0.26 and 0.08 mg/l, respectively, over the first ten years of irrigation. Uranium and selenium concentrations in the irrigation water were reduced by approximately fifty percent in 2010 and 2012.

Table 1-1. Sections 33 and 34 Irrigation Supply Concentrations

Year	Parameter					
	Uranium (mg/l)	Selenium (mg/l)	TDS (mg/l)	Sulfate (mg/l)	Chloride (mg/l)	Molybdenum (mg/l)
2000	0.27	0.12	1549	624	107	<0.03
2001	0.26	0.10	1570	642	113	0.04
2002	0.23	0.10	1564	705	126	<0.03
2003	0.22	0.08	1600	732	----	----
2004	0.26	0.09	1553	679	131	<0.03
2005	0.27	0.06	1546	732	162	<0.03
2006	0.29	0.07	1650	716	151	0.04
2007	0.28	0.06	1584	666	134	<0.03
2008	0.24	0.05	1550	702	137	<0.03
2009	0.24	0.05	1673	709	161	<0.03
2010	0.14	0.05	1711	739	167	<0.03
2012	0.12	0.04	1690	689	161	<0.03

1.2 Section 28 Irrigation

Section 28 was irrigated in 2002 through 2009, 2011 and 2012. A second set of wells supplied water to the center pivot system in the North irrigation area in Section 28.

Average uranium concentrations varied in the Section 28 irrigation water from 0.23 mg/l in 2002 to 0.39 mg/l in 2009. The average yearly uranium concentration in the applied water in 2011 and 2012 was 0.14 mg/l. Selenium concentrations were typically near 0.08 mg/l, but were roughly one-half of this value in 2011 and 2012.

Table 1-2. Section 28 Irrigation Supply Concentrations

Year	Parameter					
	Uranium	Selenium	TDS	Sulfate	Chloride	Molybdenum
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
2002	0.23	0.08	2070	881	----	----
2003	0.24	<0.005	2070	936	184	<0.03
2004	0.27	0.07	2115	919	185	<0.03
2005	0.35	0.08	2109	927	180	0.04
2006	0.35	0.08	1986	882	175	0.04
2007	0.36	0.08	2122	921	171	0.04
2008	0.36	0.07	1917	927	133	0.04
2009	0.39	0.07	2029	894	174	0.05
2011	0.14	0.03	1409	608	121	<0.03
2012	0.14	0.04	1846	756	189	<0.03

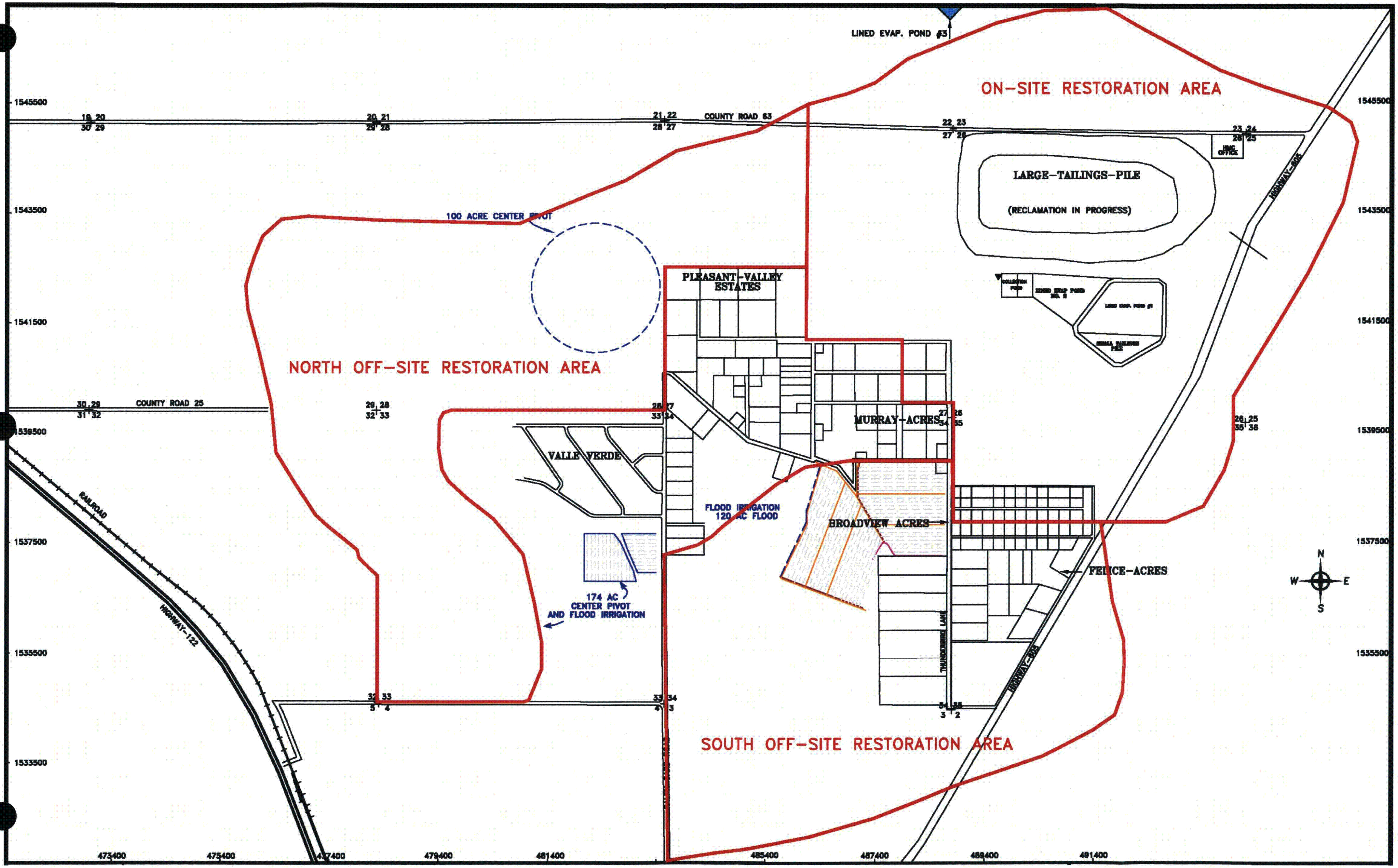
1.3 Irrigation Water Usage

Water usage, which is presented in Table 1-3, has varied from 201 acre-feet (ac-ft) in 2010 applied to the 120 acres (Section 34) to 1054 ac-ft in 2008 applied to the 394 acres (Sections 28, 33 and 34).

Table 1-3. Irrigation Water Usage

YEAR	WATER USAGE (AC-FT)	IRRIGATED AREA (AC)	AREA IRRIGATED
2000	715	270	Sections 33 and 34
2001	695	270	Sections 33 and 34
2002	995	330	Sections 28, 33 and 34
2003	949	330	Sections 28, 33 and 34
2004	1028	354	Sections 28, 33 and 34
2005	1034	394	Sections 28, 33 and 34
2006	837	370	Sections 28, 33 and 34
2007	789	370	Sections 28, 33 and 34
2008	1054	394	Sections 28, 33 and 34
2009	731	394	Sections 28, 33 and 34
2010	201	120	Section 34
2011	213	100	Section 28
2012	310	220	Section 28 and 34

Figure 1-1. Restoration Areas and the Location of Irrigation Areas



2. SUMMARY OF PAST MONITORING, ANALYSES AND DATA

Prior to irrigation, the four irrigation areas were evaluated for baseline conditions and to assess suitability for irrigation (see ERG and HYDRO, 1999). As part of the irrigation program, soil, soil moisture, and ground water monitoring programs were established to evaluate potential impacts of the irrigation. In addition, a partially saturated transport model was used to predict future impacts of the irrigation program.

2.1 Soil Moisture COC Concentrations

Suction lysimeters were installed in the irrigation field areas to collect soil moisture samples and enable the measurement of the soil moisture COC concentrations. Samples were extracted from the lysimeters when possible. However, extraction of water from the vadose zone is very difficult when the soil is relatively dry, so the frequency and number of samples is limited by soil conditions. The water samples collected from the lysimeters were analyzed for selected COC concentrations. A detailed tabulation and analysis of lysimeter water quality samples is included in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014). The lysimeters were typically installed using distilled or deionized water to slurry sand around the ceramic lysimeter cup, and the presence of this water may affect water quality in the initial samples from the lysimeter. In the following discussion, initial samples that were not representative of soil moisture water quality were excluded from consideration.

2.1.1 Section 34

Four lysimeters were installed in the clay soils in Section 34 and 33 flood areas. Lysimeters LY34-1, LY34-2 and LY34-3 are in the Section 34 flood area while LY34-4 is in the Section 33 flood area. The lysimeters were installed at depths ranging from 8 to 11 feet.

The 2013 TDS, sulfate, uranium and selenium concentrations for lysimeter LY34-1 were typically 4800, 2400, 0.35 and 0.15 mg/l, respectively. Past uranium concentrations for lysimeter LY34-1 have ranged from approximately 0.18 to 0.46 mg/l.

The 2013 TDS, sulfate, uranium and selenium concentrations for lysimeter LY34-2 were typically 4200, 2200, 0.10 and 0.05 mg/l, respectively. Past uranium concentrations for lysimeter LY34-2 have ranged from approximately 0.07 to 0.41 mg/l.

The 2013 TDS, sulfate, uranium and selenium concentrations for lysimeter LY34-3 were typically 4300, 1900, 0.39 and 0.14 mg/l, repectively. Past uranium concentrations for lysimeter LY34-3 have ranged from approximately 0.24 to 0.54 mg/l.

No samples were taken from lysimeter LY34-4 after September of 2010, but the late 2010 TDS, sulfate, uranium and selenium concentrations for were typically 3200, 1400, 0.05 and 0.05 mg/l, respectively.

2.1.2 Section 28

A total of five lysimeters were installed at three locations in the Section 28 Center Pivot area. In addition to the alluvial lysimeters at the LY28-1 and LY28-2 locations, there is also a basalt lysimeter (designated LY28-1M and LY28-2M). The lysimeters were installed to depths of 6-8 feet (LY28-2) to 19-21 feet (LY28-1M and LY28-2M). Only one sample was successfully collected from lysimeter LY28-1M and the results indicated the sample was affected by water used in installing the lysimeter.

The 2013 TDS, sulfate, chloride, uranium and selenium concentrations for lysimeter LY28-1 were typically 2670, 1200, 265, 0.18 and 0.04 mg/l, respectively. Past uranium concentrations for lysimeter LY28-1 have ranged from approximately 0.11 to 0.21 mg/l.

The 2013 TDS, sulfate, chloride, uranium and selenium concentrations for lysimeter LY28-2 were typically 4100, 2200, 270, 0.30 and 0.08 mg/l, respectively. Past uranium concentrations for lysimeter LY28-2 have ranged from approximately 0.14 to 0.93 mg/l with the greatest concentrations occurring in late 2011.

The 2013 TDS, sulfate, chloride, uranium and selenium concentrations for lysimeter LY28-2M were typically 6600, 3300, 900, 0.37 and 0.13 mg/l, respectively. Past uranium concentrations for lysimeter LY28-2M have ranged from approximately 0.04 to 0.42 mg/l.

The 2013 TDS, sulfate, chloride, uranium and selenium concentrations for lysimeter LY28-3 were typically 8600, 4200, 760, 1.2 and 0.08 mg/l, respectively. Past uranium concentrations for lysimeter LY28-3 have ranged from approximately 0.6 to 1.6 mg/l.

2.1.3 Section 33

A total of eight lysimeters were installed in Section 33 Center Pivot irrigation area at five different locations. Of the eight lysimeters, five lysimeters (LY1, LY2, LY4, LY4MU and LY4ML) were sampled successfully. Because the irrigation was discontinued in the Section 33 center pivot area after 2009, the area has dried and only a limited number of samples were taken in some lysimeters since 2010.

The 2013 TDS, sulfate, chloride, uranium and selenium concentrations for lysimeter LY1 were typically 4300, 1800, 880, 0.05 and 0.18 mg/l, respectively. Past uranium concentrations for lysimeter LY1 have ranged from approximately 0.04 to 0.065 mg/l.

The 2013 TDS, sulfate, chloride, uranium and selenium concentrations for lysimeter LY2 were typically 4100, 2000, 470, 0.06 and 0.15 mg/l, respectively. Past uranium concentrations for lysimeter L2 have ranged from approximately 0.04 to 0.076 mg/l.

The 2013 TDS, sulfate, chloride, uranium and selenium concentrations for lysimeter LY4 were typically 3500, 1800, 580, 0.02 and 0.11 mg/l, respectively. Past uranium concentrations for lysimeter LY4 have ranged from approximately 0.02 to 0.08 mg/l.

The 2013 TDS, sulfate, chloride, uranium and selenium concentrations for lysimeter LY4MU were typically 4200, 1240, 770, 0.49 and 0.01 mg/l, respectively. Past uranium concentrations for lysimeter LY4MU have ranged from approximately 0.15 to 0.69 mg/l.

The most recent samples for lysimeter LY4ML were collected in 2011. The 2011 TDS, sulfate, chloride, uranium and selenium concentrations for lysimeter LY4ML were typically 3200, 900, 650, 0.56 and 0.03 mg/l, respectively. Past uranium concentrations for lysimeter LY4ML have ranged from approximately 0.21 to 0.66 mg/l.

2.2 Soil Moisture Content

In July of 2012, two different types of soil moisture measurement devices were installed in the Section 34 flood area and the Section 28 center pivot. The devices included a Campbell Scientific CS655 water content reflectometers and Campbell Scientific CS229 heat dissipation matric water potential sensors. A detailed analysis of soil moisture content measurements is included in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014).

2.2.1 Section 34

A CS655 and a CS229 were installed at depths of 5 feet, 10 feet, and 15 feet in the Section 34 flood area next to lysimeter LY34-3. The initial soil moisture contents for the three Section 34 flood intervals were very low. Although the instruments did provide some qualitative indications of the movement of irrigation water through the soil profile, the measurements of soil moisture are indirect and the discontinuation of irrigation after 2012 has resulted in a reduction in soil moisture moving through the profile.

2.2.2 Section 28

The soil moisture measurement devices were installed next to lysimeters LY28-2 and LY28-2M. One of each instrument was installed at 4, 6, and 8 feet below the ground surface. The moisture content measurements did show minor cycling associated with irrigation events and have indicated a gradual drying of the profile since irrigation was discontinued after 2012. Although the soil moisture measurements do generally reflect the movement of water through the soil, they do not provide information on water quality impacts of irrigation.

2.3 Predicted Soil Moisture COC Concentrations

In order to evaluate future impacts of the irrigation program on ground water, the partially saturated numerical flow model LEACHP was used to predict the movement of COCs through the soil profile. These predictions were compared with and largely support the measured lysimeter constituent concentrations in the soil profile. The results of the LEACHP modeling are presented in Appendix C of *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014). The LEACHP simulations are compared with lysimeter sample data for 2013, and the simulations extend through year 2100 to predict future irrigation impacts.

With the termination of the irrigation program and the planned closure of the land application areas, the LEACHP model results are very useful in evaluating future impacts of the irrigation on ground-water quality. The following sections present example LEACHP predictions for the Section 34 flood irrigation and Section 28 center pivot irrigation areas to illustrate the very limited expected impact on the alluvial ground water.

2.3.1 Section 34

The past flood irrigation and future COC disposition in the soil profile in Section 34 was simulated with LEACHP as described in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014). The simulations were done with the assumption that irrigation continued through 2014, but the future predictions of COC movement through the soil profile will not be appreciably affected by the termination of irrigation after 2012. Figures 2-1 and 2-2 present simulation results previously presented in figures C-1 and C-4 of Appendix C of *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014), respectively. The simulation results in figures 2-1 and 2-2 were compared with observed lysimeter soil moisture TDS and uranium concentrations for lysimeters LY34-1, LY34-2 and LY34-3 for 2012 and 2013. These comparisons illustrate that LEACHP predictions are consistent with lysimeter results, and that virtually all of the uranium contained in the irrigation water applied through 2012 is retained within the upper 10 feet of the soil profile. The TDS, sulfate and chloride contained in the irrigation water applied through 2012 is also largely retained within the upper 10 feet of the soil profile. The predicted soil moisture COC concentrations for years 2030, 2050 and 2100 indicate that constituents will continue to migrate through the soil profile after the irrigation is discontinued, and that the pulse of elevated constituent concentrations in the soil profile is spread and attenuated as it slowly moves through the profile. After irrigation is discontinued, the expected annual recharge to the ground water in the flood irrigation area is very small and this results in a very slow rate of movement for the constituents in the soil moisture.

A conservatively large estimate of the long-term recharge to the field which reports as drainage of soil moisture from the bottom of the soil profile is 9 mm/year or 2.2 gpm for the 120 acre flood area.

2.3.2 Section 28

As in the Section 34 flood area, the past irrigation and future COC disposition in the soil profile in the Section 28 Center Pivot area was simulated with LEACHP. Figures 2-3 and 2-4 present simulation results previously presented in figures C-8 and C-11 of Appendix C of *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014), respectively. The simulation results in Figures 2-3 and 2-4 were compared with observed lysimeter soil moisture TDS and uranium concentrations for lysimeters LY28-1, LY28-2, LY28-2M and LY28-3 for 2012 and 2013. These comparisons illustrate that LEACHP predictions are consistent with lysimeter results, and that the virtually all of the uranium contained in the irrigation water applied through 2012 is retained within the upper 30 feet of the soil profile. The conservative constituents represented by TDS have migrated to the ground water. The predicted soil moisture COC concentrations for years 2030, 2050 and 2100 indicate that COCs will continue to migrate through the soil profile with attendant spreading and attenuation. The expected annual recharge to the ground water in the sprinkler irrigation area is small and this results in a very slow rate of movement for the constituents in the soil moisture. A conservatively large estimate of the long-term recharge to the field which reports as drainage of soil moisture from the bottom of the soil profile is 9 mm/year or 1.8 gpm for the 100 acre pivot area.

2.3.3 Section 33

No predictions of COC concentrations in soil moisture were made for the Section 33 center pivot or the Section 33 flood area. Irrigation was discontinued in Section 33 after 2009, and the movement of COCs in the soil moisture is expected to be very slow.

2.4 Soil Health

Soil health as related to irrigated crop production is generally monitored as a function of the salt loading of the soils and potential adverse effects on soils due to excessive sodium in the irrigation water and in the soils. In order to understand the possible effects of these parameters on the irrigated soils, characteristics of the soil including soil particle size and texture, natural salt and sodium levels, bulk density, clay mineralogy, infiltration rates, hydraulic conductivity, and depth to bedrock were previously measured or evaluated. This information has been detailed in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014). The following sections summarize the baseline soil conditions at the Grants irrigation sites and the effects, if any, of many years of irrigation on the soil health.

2.4.1 Irrigated Soil Physical Characteristics

Prior to establishment of the irrigated areas, a detailed assessment of the potential soils to be irrigated was conducted in 1998. Originally, SCS (now NRCS) soil mapping was used to establish baseline conditions at the site and backhoe trenching was utilized to further characterize the irrigation areas. Following is a general description of those soils prior to irrigation.

For the Section 33 Center Pivot area, the majority of the area is comprised of the Mespun sandy loam to sandy soil series with minor acreages of Sparank sandy clay loam to clay loam and the Aparejo silty clay loam series. Following the backhoe examination, it was determined that the soils located under the pivot were comprised largely of the Mespun series and another sandy series referred to as the Glenberg, or Glenberg-variant soil series. Both soils have sandy loam to loam surface textures. The Mespun soil developed in wind blown sands and the surface sandy loam layer is shallow, generally 10 inches or less. Below 10 inches are high permeability stratified fine to medium sands. The Glenberg soils developed in fluvial deposits and the sandy loam to loam surface layer is up to 24 inches thick. Below 24 inches are highly permeable stratified fine to medium sands. The Glenberg soils generally have slopes of one percent or less and the Mespun soil slopes range from on to six percent.

The NRCS mapped the Section 28 center pivot area as the Glenberg soil series with San Mateo soils occurring in swale areas. The backhoe examination confirmed the NRCS mapping and the majority of the area under the Section 28 center pivot is comprised of Glenberg sandy loam soils. This soil generally has sandy loam surface and subsurface soils ranging up to 24 inches in depth. Below 24 inches are stratified medium and fine sands. Swales are dominated by the San Mateo sandy clay loam soils consisting of loam to sandy clay loam surface and subsurface textures up to 28 inches deep. Below 28 inches are fine to medium stratified sands.

The Section 34 flood irrigated soils were mapped by the NRCS with the majority of these soils described as the Sparank clay loam soils. These soils are characterized as having clay loam surface horizons with clay loam to clay subsurface horizons ranging up to 24 to 36 inches deep. Generally, stratified clay loam, sandy clay loam, and silty clay loam soils are found below these depths. Field examinations, including backhoe trenches, indicate that the northern one third of these soils in the flood irrigation area are the San Mateo soils with sandy clay loam to clay loam surface textures and clay loam sub-surface textures to 24 inch depths. Below 24 inches in these soils are stratified fine and medium sands. The remaining soils were determined to be the Sparank series as described by the NRCS. However, these soils were found to have stratified fine and medium sands located at depths of about 36 inches.

The Section 33 flood irrigated soils were mapped by the NRCS as the Sparank soils. These soils are characterized as having clay loam surface horizons and clay loam to clay subsurface horizons to depths of 72 inches. Field investigations for these soils showed that the southwest portion of the Section 33 flood irrigated soils were comprised of the Aparejo clay loam soil series, sandy substratum phase. The remainder of the soil was the Sparank clay loam soils as mapped by NRCS. Like some of the Section 34 flood irrigated soils, these soils had fine to medium sands at depths of

24 to 36 inches. As with the Section 34 flood irrigated area, these soils were historically flood irrigated in the 1950's and 1960's. These soils were seeded to grasses and irrigated in 2004, 2005 and 2008. They were tilled and seeded with triticale in the fall of 2008.

2.4.2 Soil Salt and Sodium Relationships with Irrigation Water Quality

Previous measurement of soil chemistry, particularly sodium levels and salt (Electrical Conductivity - EC) levels provided an understanding of the amount of soil constituents that remain in the soil after irrigation was ceased. For the arid to semi-arid soils found at the site, all native vegetation is considered very salt tolerant. When evaluating the potential salt toxicity for agricultural crops, the most sensitive crop that was grown on the irrigated sites was alfalfa. The level of salts in the soil that would be expected to cause some toxicity on alfalfa is 4500 micro-mhos per centimeter (µ℧ /cm).

Sodium affects soil physical properties by causing soil clays to expand and disperse. The expansion of clay results in a significant decrease in soil permeability making it difficult to push water through the soil profile.

Since soil clays are directly affected by sodium, it stands to reason that sandy center pivot soils are not generally affected by the presence of high sodium levels. Conversely, heavy clay irrigated soils have a higher risk for being adversely affected by higher sodium levels. In addition, the salinity concentrations in the soil and irrigation water will alter how significant the effect of sodium is on the soil clays. Salts tend to flocculate clays, reducing the amount of clay expansion. When salts are significant, soil permeability may not be affected at all by higher concentrations of the sodium. Section 2.4.2 of *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014) describes in detail the soil physical and chemical interactions of salts and sodium for long term soil health at the previously irrigated areas. Tables B-1 and B-2, located in Appendix B of the previously referenced report, summarize the Soil Health Risk Assessment used to evaluate the long term impact on the site soils.

2.4.3 Effects of Irrigation on Soil Health

For the Section 33 center pivot area, the Sodium Adsorption Ratio (SAR) for background soil samples without irrigation was approximately 1.0. After the 2013 season, the reported average SAR under the center pivot for the 3 foot root zone was 7.30. Table B-2 in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014) shows the soil health risk, as a result of past irrigation, would still be considered very low (VL) for the coarse loamy center pivot soils. As a result, the Section 33 sandy soils do not show adverse effects due to the resident sodium levels.

The background electrical conductivity (EC) levels for all depths for the Section 33 pivot ranged from 200 to 1,740 µ℧ /cm. After the 2013 season, the average EC for the zero to three foot root zone under the pivot averaged 5,310 μ℧ /cm. Salt constituent concentrations are lower than levels that will create concern over potential toxicity for the native vegetation that will populate the previously irrigated site. Over time, the EC level in these soils is expected to decrease further due to seasonal monsoonal leaching.

For Section 28, the average background SAR in the soil for all depths is 1.21. After the 2013 irrigation season, the average SAR under the pivot in the 3 foot root zone was 3.56. As with the Section 33 sandy irrigated soils, the long term soil health risk due to sodium in these soils is very low (VL).

The average background EC of the 3 foot soil root zone for Section 28 is 773 μ℧ /cm. In 2013 the average EC was 4,200 μ℧ /cm for the 3 foot root zone. This soil salt level is well below any native vegetation salt tolerances and the Section 28 sandy soils will not have salt toxicity problems. Over time, EC levels in the root zone may decrease further due to seasonal monsoonal leaching.

For the Section 34 flood area the average background SAR for the 3 foot root zone is 3.62. Following the 2013 season, the average SAR level under the irrigated areas for the 3 foot zone was 11.10. Referring to Table B-2 in the *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014), the overall soil health risk for these fine loamy to fine soils is low (L).

The average background EC of the 3 foot root zone is 2,367 μ℧ /cm for the Section 34 flood area. After the 2013 irrigation season, the average EC for the flood irrigated areas for the 3 foot root zone was 6,867 μ℧ /cm. While these EC levels may be marginal for some crops such as alfalfa, these salinity concentrations are not considered toxic to the native vegetation that could take over the site.

For the Section 33 flood irrigated soils, the average background SAR was 1.43 for the 3 foot root zone. The average SAR after irrigation ceased for the 3 foot root zone was 2.54. The SAR value after five years of irrigation is still well below levels of concern for reducing hydraulic conductivities and permeability, and no long term adverse effects due to irrigation are ever expected to occur.

The average background EC for the Section 33 flood area for the 3 foot zone is 828 μ℧ /cm. After irrigation ended, the average 3 foot root zone EC was 1,746 μ℧ /cm. These EC levels are well within the desired toxicity range for native vegetation at this site.

2.4.4 Conclusions

Soil Health considerations associated with irrigation programs at the GRP were generally centered around the effects of excess sodium on soil physical properties and on salt buildup to potentially toxic levels for vegetation or crops. The potential risk that these elements pose is much different for sandy soils than for heavier clay or clay loam soils. The low clay content of sandy soils allows for much higher sodium concentrations because sodium has no adverse effect on sand particles. The irrigation water quality for the site wells can be classified as C4S1 water with SAR levels less than 10 and EC levels greater than 2,250 μ℧ /cm. The average SAR for the site water is 5.2 and the average EC is 2,690 μ℧ /cm. This water quality is rated as very low to low sodium risk on sandy soils and low sodium risk on fine loamy soils, due to the flocculation effects that salts have on soil clays. As such, no long term adverse effects related to sodium application in irrigation waters are ever expected to occur in these soils.

While salt concentrations are important to counteract the effect of higher sodium levels on soil clays, the salts may have a toxic effect on vegetation. Leaching of salts at all sprinkler and flood irrigated sites has prevented the buildup of salts to toxic levels for all types of vegetation. Review of the annual data indicates that the soil health, as related to salts and sodium, has not been adversely affected over the years and is not expected to create long term adverse effects on these soils when they return to native vegetation

2.5 Ground-Water Quality

Monitoring of ground-water quality in the irrigated area allows detection of any significant impacts from the irrigation program. Monitoring wells installed in and around the irrigation areas are sampled periodically to evaluate both overall site restoration progress and the potential impacts of the irrigation program.

2.5.1 Section 34

The Section 34 irrigation consisted of 120 acres of flood irrigation in the northeastern portion in Section 34. Ground-water monitoring wells 844, 845, 846, 555, 556 and 557 have been used to monitor the ground-water quality in this area. Available water quality data is discussed in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014).

2.5.2 Section 28

The Section 28 area consisted of 60 acres of center pivot irrigation from 2002 through 2004, and, after expansion of the center pivot area, 100 irrigated acres from 2005 through 2009 and in 2011 and 2012. Figure 1-1 shows the location of the 100 acre center pivot. Numerous monitoring wells exist in this area and have been used to define the water quality changes over time. Available water quality data is discussed and presented in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014).

2.5.3 Section 33

Section 33 irrigation consisted of the 150 acre center pivot and 24 acres of flood area. Monitoring wells 551, 553, 554, 647, 649, 657 and 658 have been used in evaluating the ground-water COC concentrations adjacent to the 150 acre center pivot while alluvial well 650 while used to monitor the Section 33 flood area. Available water quality data is discussed and presented in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014).

2.6 Predicted Irrigation Impacts on Ground-Water Quality

A prediction of potential impacts of irrigation on ground-water quality was made using the measurements and predictions of COC migration through the soil profile described in Section 2.3 in combination with measured ground-water COC concentrations. A calculation of the mixing of the water migrating through the soil profile with the ground water was done using long-term recharge estimates for each of the two proposed future irrigation areas to estimate the potential change in the ground water quality. The measured lysimeter soil moisture concentrations were considered the best predictor of the average concentrations that could migrate in the soil moisture to the ground water. These measured concentrations were multiplied by the estimate of average recharge to obtain an estimate of the long-term mass constituent flux from irrigation. The average recharge rate is estimated by the long-term flux of soil moisture beyond the root zone under anticipated long-term soil and vegetation conditions. These calculations were expected to yield an estimate of the potential long-term effect on the ground water from the irrigation when the soil moisture mixes with the restored ground water.

The restored ground-water concentrations are based on the restored concentrations to the east of the Section 34 flood area and the northern portion of the Section 28 pivot. The Section 28 restored area is smaller due to the larger concentrations that still exist in Section 28. The expected restored TDS concentration in Section 34 and Section 28 irrigation areas is 1800 mg/l. The expected restored ground-water sulfate concentrations in Section 34 and Section 28 are 800 and 600 mg/l, respectively. Restored chloride concentrations in the Section 34 and Section 28 irrigation areas are expected to be 170 and 150 mg/l, respectively. The estimated restored ground water uranium concentration for Sections 34 and 28 irrigation areas were 0.08 and 0.1 mg/l, respectively. Restored selenium concentrations of 0.05 and 0.04 mg/l are expected for the Section 34 and Section 28 irrigation areas, respectively, based on the restored values near these areas. The restored molybdenum concentration in the Sections 28 and 34 irrigations areas is expected to be near 0.03 mg/l while the restored nitrate concentration is expected to be 7 mg/l.

The average long-term recharge rate for the irrigation areas was estimated from available water balance and recharge studies conducted by the USGS and other researchers and is described in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014).

The results of the recharge studies lead to a moderately conservative estimated annual recharge rate of two percent of the average annual precipitation of 10.4 inches (265 mm). This equates to approximately 0.21 inches (5 mm) of annual recharge. As an additional measure of conservatism, an annual recharge rate of 0.35 inches (9 mm) or 3.3 percent of annual precipitation was considered in calculations of long-term recharge in the irrigation areas. The LEACHP simulations of the irrigation areas resulted in a similar estimate (approximately 9 mm) of recharge with the assumptions of relatively limited water consumption by vegetation.

2.6.1 Section 34

The following discussion summarizes the predictions of irrigation impacts on ground-water quality presented in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014).

As the ground water moves down gradient of the irrigation area, the predicted mixing of soil moisture with the entire saturated thickness which will result in an average TDS concentration of 1,977 mg/l. This small increase above 1,800 mg/l will be difficult to detect considering the natural variations that exist in the alluvial aquifer. The mixing of soil moisture with the ground water is predicted to result in a sulfate concentration of 1,054 mg/l in the upper ten feet of the alluvial aquifer in the irrigation area and 894 mg/l down gradient of the irrigation area. This small increase above 800 mg/l would be very difficult to detect and is not expected to occur for several decades. The mixture of the soil moisture chloride concentrations from the irrigation with the alluvial ground water in the Section 34 Flood irrigation area results in a predicted alluvial chloride concentration of 234 mg/l in the upper ten feet and a predicted concentration of 194 mg/l after the soil moisture completely mixes with the alluvial ground water. As with sulfate, this small increase in chloride concentrations is not significant.

The mixing of the ground water with the long-term recharge flux results in predicted uranium concentrations of 0.13 and 0.10 mg/l, respectively for the mixing with the upper ten feet and the full aquifer thickness mixing. These calculations show that, even if the uranium made it to the water table, only a very small increase in the uranium concentration would occur and the predicted concentrations would remain below the San Mateo alluvial background concentration of 0.16 mg/l. The mixing of the ground water and long-term recharge produces a predicted selenium concentration of 0.057 mg/l for the upper ten feet of ground water. This small increase in selenium concentration would not be detectable in the ground water. The mixing of the ground water and long-term recharge produces a predicted molybdenum concentration of 0.04 mg/l for the upper ten feet of ground water. This small increase in molybdenum concentration would not be detectable in the ground water. The mixing of the ground water and long-term recharge produces a predicted nitrate concentration of 8.2 mg/l for the upper ten feet of ground water. This small increase in nitrate concentration would not be detectable in the ground water.

2.6.2 Section 28

The following discussion summarizes the predictions of irrigation impacts on ground-water quality presented in *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014).

The mixing of the ground water with a conservatively large estimate of long-term recharge rate is predicted to result in an increase of TDS in the upper ten feet of ground water to 1,873 mg/l. Table This small increase in TDS is expected to have already occurred through the sandy soils in Section 28 due to the faster rate of movement of the soil moisture. As the ground water moves down gradient of the irrigation area, the soil moisture will mix with the entire saturated thickness which is predicted to result in an average TDS concentration of 1,837 mg/l. This small increase above 1,800 mg/l would likely be undetectable.

The mixing of the ground water with long-term recharge is predicted to result in an increase of sulfate concentration in the ground water to 642 mg/l in the upper ten feet in the irrigation area and 621 mg/l down gradient of the irrigation area as it is mixed with the entire alluvial aquifer. This small increase in sulfate will likely be undetectable. The mixing of the ground water with long-term recharge is predicted to result in an increase of chloride concentration in the ground water to 158 mg/l in the upper ten feet in the irrigation area and 154 mg/l down gradient of the irrigation area. This small increase in chloride concentration would likely be undetectable.

The mixing of the ground water with the long-term recharge flux results in predicted uranium concentrations of 0.11 and 0.10 mg/l respectively for the mixing with the upper ten feet and the full aquifer thickness mixing. These calculations show that, even if the uranium makes it to the water table, only a very small increase would occur in the uranium concentration in the ground water and the predicted concentrations would remain below the San Mateo alluvial background concentration of 0.16 mg/l. The mixing of the upper ten feet of ground water with the long-term recharge flux results in a predicted selenium concentration of 0.057 mg/l. The mixing of the upper ten feet of ground water with the long-term recharge flux results in a predicted molybdenum concentration of 0.03 mg/l. The mixing of the upper ten feet of ground water with the long-term recharge flux results in a predicted nitrate concentration of 7.4 mg/l. The small increases in selenium, molybdenum, and nitrate concentration in the ground water would likely be undetectable.

2.6.3 Section 33 Pivot

Because the irrigation for the Section 33 pivot ended after 2009 and previous mixing calculations indicated very little impact, no mixing calculations were done for the Section 33 pivot area. Ground-water monitoring in the area is expected to continue until site closure.

2.6.4 Section 33 Flood

Because the irrigation for the Section 33 flood area ended after 2009 and previous mixing calculations indicated very little impact, no mixing calculations were done for the Section 33 flood area. Ground-water monitoring in the area is expected to continue until site closure.

Figure 2-1. Figure C-1 from 2014 Irrigation Report

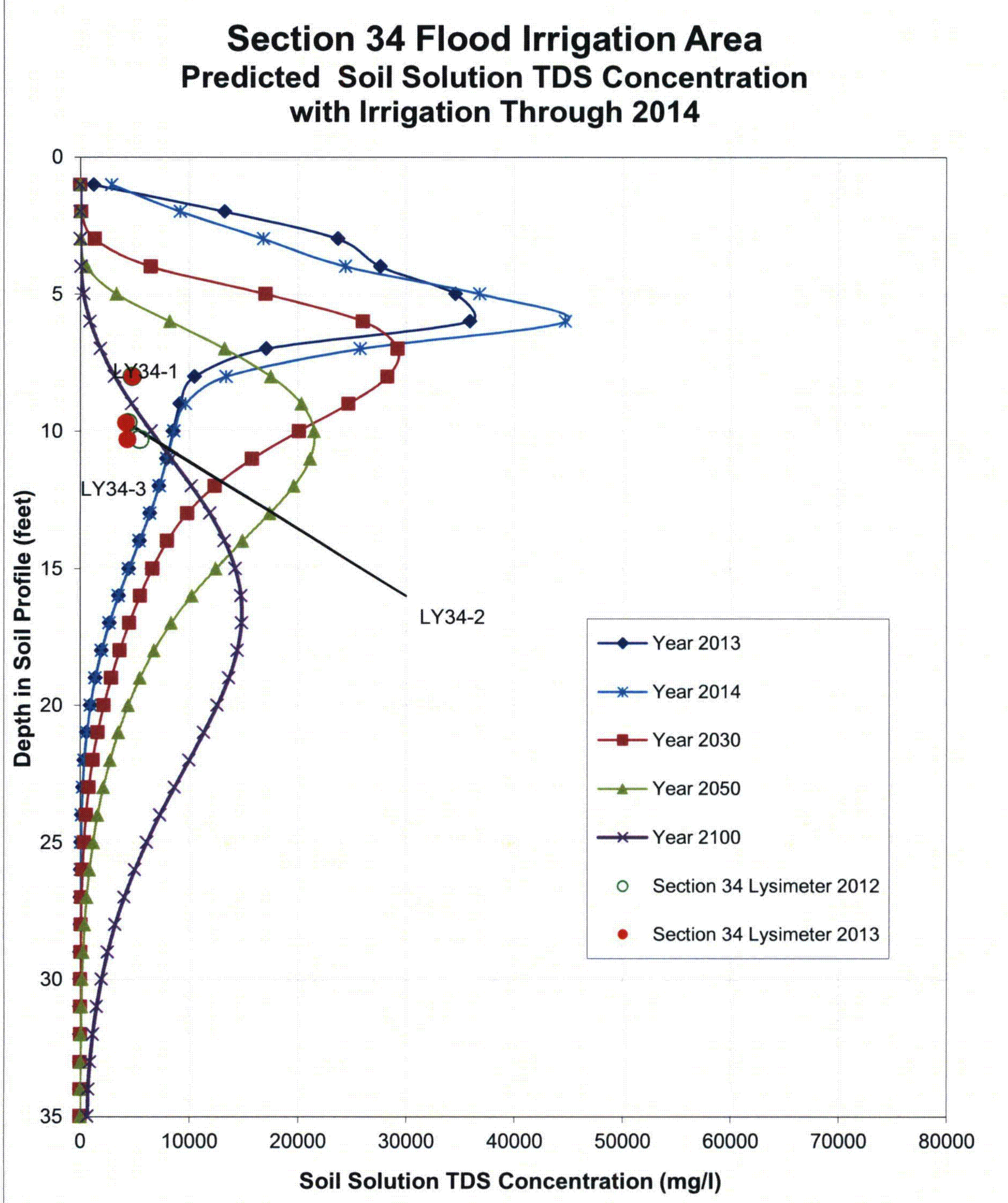


Figure C-1. Predicted and Observed Soil Solution TDS Concentration, (mg/l), for the Section 34 Flood Irrigation

Figure 2-2. Figure C-4 from 2014 Irrigation Report

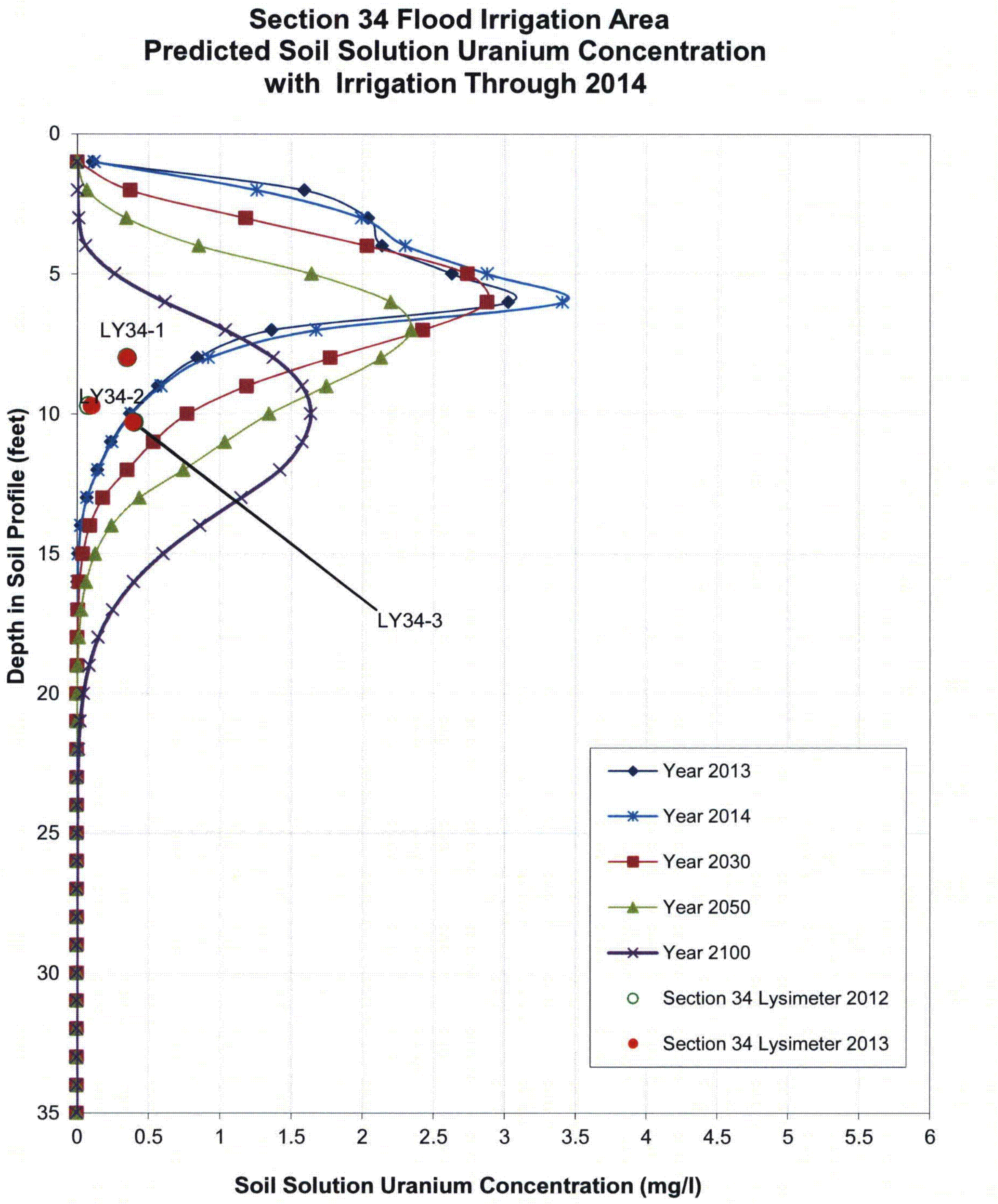


Figure C-4. Predicted and Observed Soil Solution Uranium Concentration, (mg/l), for the Section 34 Flood Irrigation

Figure 2-3. Figure C-8 from 2014 Irrigation Report

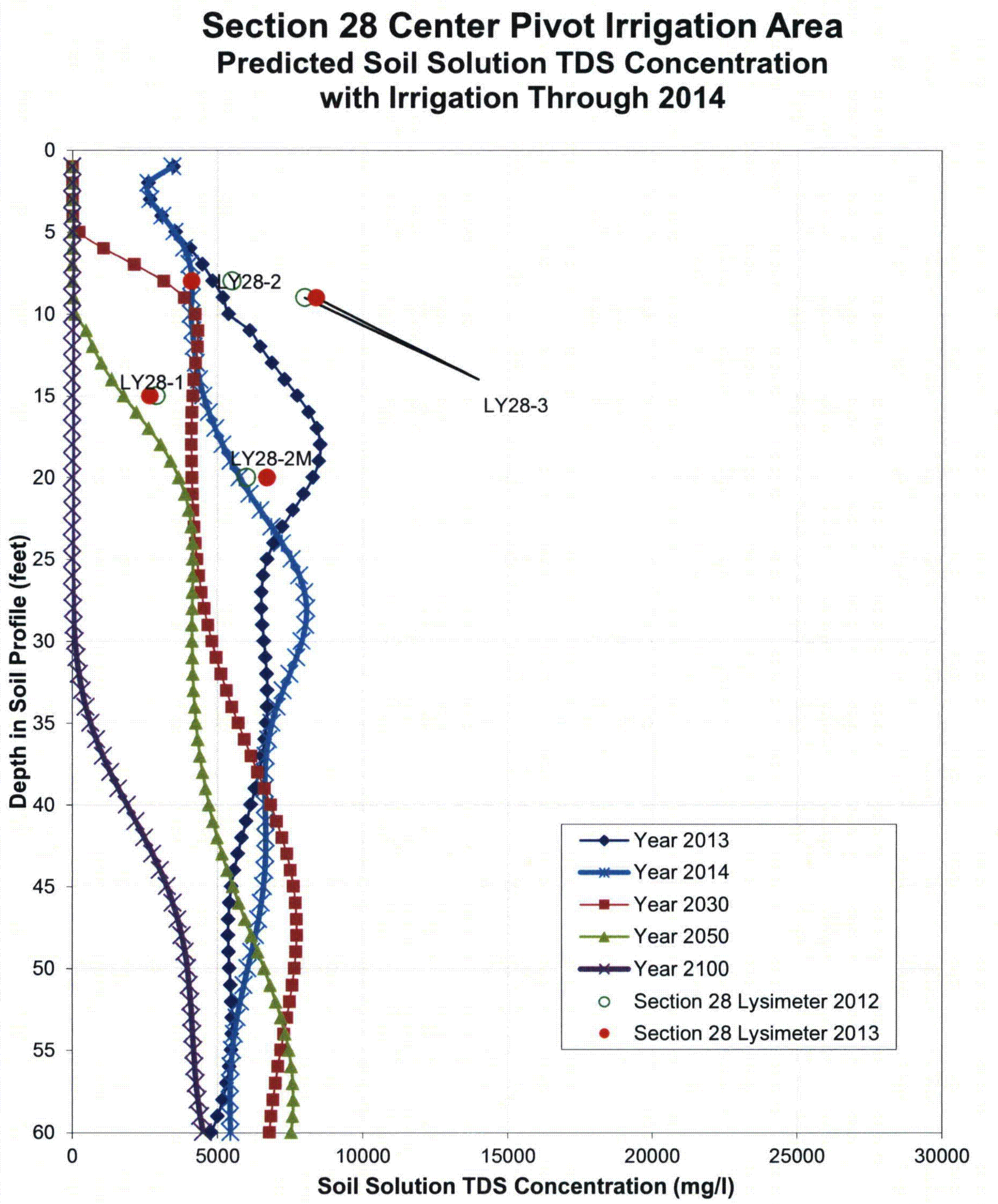


Figure C-8. Predicted and Observed Soil Solution TDS Concentration, (mg/l), for the Section 28 Center Pivot Irrigation

Figure 2-4. Figure C-11 from 2014 Irrigation Report

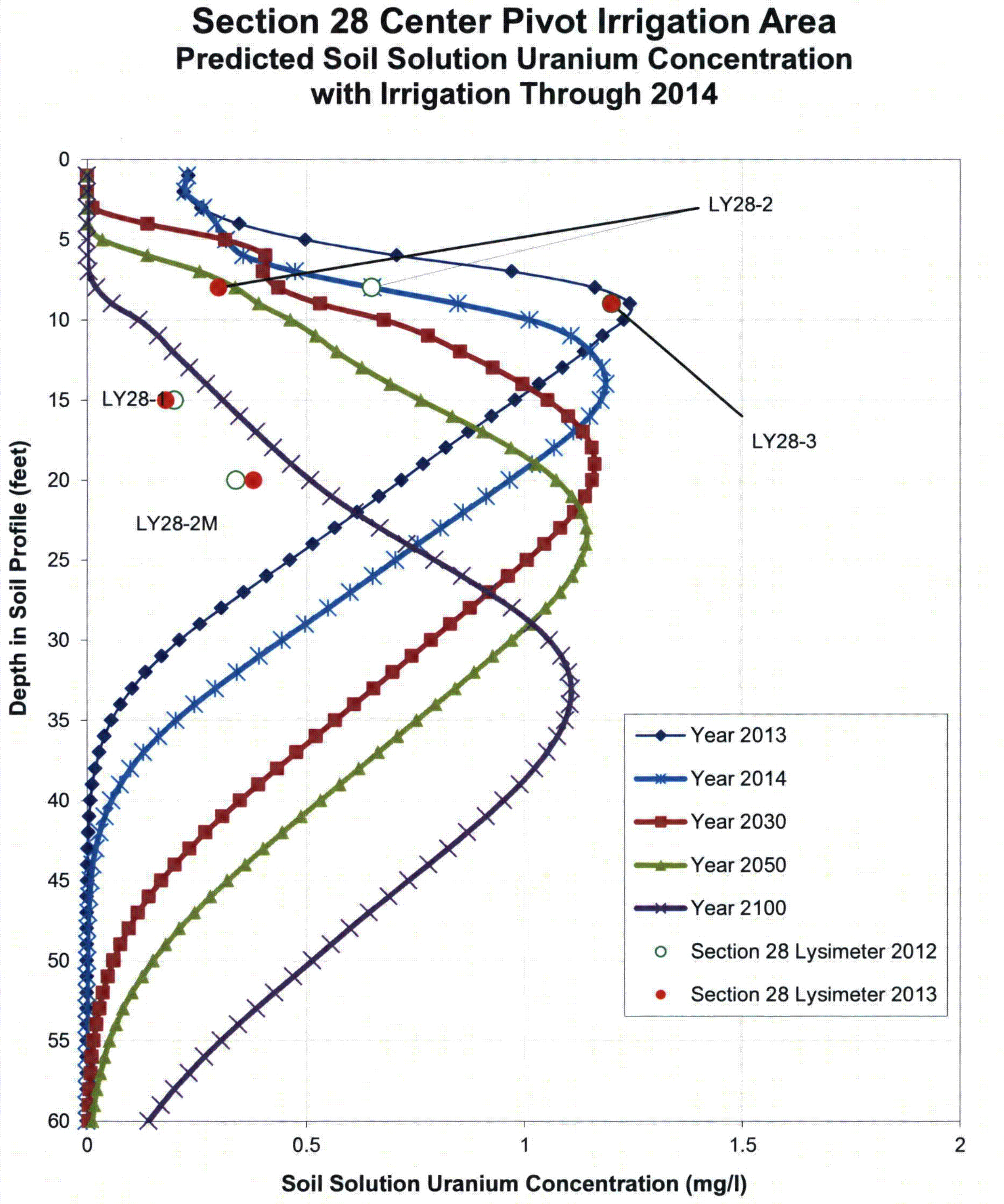


Figure C-11. Predicted and Observed Soil Solution Uranium Concentration, (mg/l), for the Section 28 Center Pivot Irrigation

3. DESCRIPTION OF CLOSURE MEASURES

The four irrigation areas are planned to be closed and this section presents the closure plan for the irrigation equipment and power lines. Please be aware that the US Environmental Protection Agency (EPA) is currently conducting a Remedial Investigation / Feasibility Study (RI/FS) for Homestake's Grants Reclamation Project. One or more portions of the RI/FS may address closure measures. In the event of a conflict between what is set forth herein and what is given in the RI/FS, the information set forth in the RI/FS shall prevail. Furthermore, the US Nuclear Regulatory Commission (NRC) is currently reviewing a Corrective Action Program (CAP) for Homestake's Grants Reclamation Project. Even though the Land Application Areas are outside of the NRC-licensed boundary of the site, the NRC is the lead regulatory agency in charge of the reclamation and remediation activities at the site. In the event of a conflict between what is set forth herein or the attachments hereto and what is required by NRC, the requirements of NRC shall prevail.

3.1 Irrigation Equipment

The equipment used in the irrigation areas is planned to be dismantled and removed with in accordance with HMC's NRC License Conditions. The major irrigation equipment consists of center pivots in the Section 33 and Section 28 irrigation areas and gated pipe in the Section 34 and 33 flood areas. A survey plan to assess the presence (or absence) of contaminated materials will be written in accordance with HMC's procedures so as to ensure this equipment can be spot checked internally and externally. If the surveys reveal the equipment can be safely released, it may be sold for scrap. Alternatively, this equipment may be cut into manageable pieces and deposited into either of the two southern evaporation ponds for long-term internment upon final site closure. While not likely, if the surveys reveal the presence of contamination that cannot be easily removed, the equipment will be cut into manageable pieces and deposited into either of the two southern evaporation ponds for long-term internment upon final site closure.

3.1.1 Sections 33 and 34 Gated Pipe

The Section 34 flood area has gated pipe along the eastern edge of this flood field and the northeast side of the western portion of the Section 34 flood area. This 120 acre flood area is just south of Murray Acres and west of Broadview Acres. An additional 24 acres of flood irrigation existed just south of Valle Verde and gated pipe was also used to distribute the irrigation water in this area. The gated pipe is planned to be dismantled, removed, and disposed of properly.

3.1.2 Section 28 Center Pivot

The Section 28 irrigation area has a 100 acre center pivot in the eastern portion of Section 28 (see Figure 1-1). The center pivot equipment will be dismantled, removed and disposed of properly. The pipelines and power lines in the Section 28 area are being used in the North Off-Site restoration and may be decommissioned after restoration is complete in this area.

3.1.3 Section 33 Center Pivot

A 150 acre center pivot exists in the southwest portion of Section 33. This center pivot equipment will be dismantled, removed and disposed of properly. Wells in this area will continue to be monitored and therefore the power installed in this area will be used for pumping samples from these wells. The buried power line and supply pipeline that run to the center pivot from the south side of the pivot may be disconnected and the deactivated and isolated buried wire will be left in place.

3.2 Power Lines

The power lines installed for the collection wells are still being used in the Off-Site restoration program for monitoring or collection well pumping. These power lines may be dismantled or possibly transferred with the land at the end of the Off-Site restoration program. The buried power line to the center pivot in Section 33 is not planned to be used in the future and is proposed to be completely disconnected and left buried in the Section 33 pivot area. Leaving the deactivated and isolated buried wire in place avoids unnecessary surface disturbance and presents no additional risk to the public.

3.3 Pipelines

Surface and buried pipelines were used to collect and convey water to the irrigation areas. Many of the irrigation supply wells and the supporting collection pipeline infrastructure have been converted to use in the ongoing ground-water restoration program. In the Section 28 irrigation area, the irrigation pipelines have been converted to use in the ground-water restoration program and will be addressed as part of the final site closure. The following discussion addresses those pipelines that are not used in other ground-water restoration activities.

The unused buried pipelines in the Section 28 and 33 irrigation areas are proposed to be disconnected at both ends and left in place. This approach avoids the significant surface disturbance required to excavate and remove the buried pipe. The ends of the pipeline will be cut off below land surface so there is no access to the buried pipe. The isolated sections of buried pipe are not expected to present any significant human health risk.

The unused surface pipelines in the Section 33 irrigation area will be removed. The pipelines may be used for other purposes at the site or disposed of properly.

4. POST-CLOSURE LAND USE

The evaluation of post-closure land uses considered the past land use of the irrigation areas as well as current land uses for the surrounding area. Prior to the irrigation program, the land use for the irrigation areas was primarily livestock grazing and agricultural production. The land uses for the surrounding areas are agriculture, livestock grazing, residential development, and limited commercial development. Please be aware that the US Environmental Protection Agency (EPA) is currently conducting a Remedial Investigation / Feasibility Study (RI/FS) for Homestake's Grants Reclamation Project. One or more portions of the RI/FS may address post-closure land use. In the event of a conflict between what is set forth herein or the attachments hereto and what is given in the RI/FS, the information set forth in the RI/FS shall prevail. Furthermore, the US Nuclear Regulatory Commission (NRC) is currently reviewing a Corrective Action Program (CAP) for Homestake's Grants Reclamation Project. Even though the Land Application Areas are outside of the NRC-licensed boundary of the site, the NRC is the lead regulatory agency in charge of the reclamation and remediation activities at the site. In the event of a conflict between what is set forth herein or the attachments hereto and what is required by NRC, the requirements of NRC shall prevail.

4.1 Potential Post-Closure Land Uses

The post-closure land uses are not restricted by the past irrigation with alluvial aquifer ground water. All prior land uses for the irrigation areas, including agriculture, livestock grazing and wildlife habitat, remain available as post-closure land uses. The evaluation of soil health in Section 2.4 indicates that the irrigation program did not diminish the potential for future agricultural production in the irrigation areas. Likewise, the predicted impacts of the irrigation on ground-water quality are not significant (see Section 2.6) and do not restrict future land use.

4.2 Non-radiological Human Health Evaluation

Human health risks associated with non-radiological constituents (uranium and selenium) were evaluated by comparisons of measured values in soil from 1998 to 2012 contained in the *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* (Environmental Restoration Group and Hydro-Engineering, 2014) against the latest New Mexico Environmental Department Soil Screening Levels (SSLs) for soils under residential or groundwater protection pathway assuming conservatively a dilution attenuation factor (DAF) of 1(NMED, 2012). The SSLs used for these comparisons are applicable to sites in the state and are based on carcinogenesis or other health hazards such as chemical toxicity (NMED, 2012). Respective SSL values were developed using a total cancer risk = 10^{-5} or a Hazard Quotient = 1 (NMED, 2012).

The results for each irrigation area indicate that SSLs for uranium (both the residential and the groundwater pathway) are higher than all measured uranium concentrations as shown on Figure 4-1.

For selenium, eight soil samples exceed the SSL DAF1 value of 0.965 mg/kg. All of these samples were collected from Section 34 sample location called F-1 in the *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* report. No soil samples exceed the SSL for residential pathway or the groundwater SSL assuming a dilution attenuation factor of 20 (SSLDAF 20) of 19.3 mg/kg. The equivalent of the dilution attenuation factor calculation is presented in Appendix C of the *Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water* report. This "mixing" calculation is a direct parallel to the DAF and incorporates the geometry of the irrigation areas, long-term estimates of infiltration flux rate, and the estimated rate of ground-water flow beneath the irrigation areas to calculate the mixing or dilution ratio of the ground-water flow to the infiltration flux. This ratio or DAF equivalent ranges from 39.7 to 208 for full mixing of the infiltration flux rate with the underlying ground water for the irrigation areas. Even with the assumption of limited mixing in the upper 10 feet of the underlying aquifer, the ratio or DAF equivalent ranges from 14.7 to 105. The maximum soil selenium concentration is significantly smaller than the SSLDAF 20 concentration of 19.3 mg/kg, and the typical mixing ratio or DAF equivalent is greater than 20.

Based on this screening level evaluation, the uranium and selenium levels in soil within the irrigation areas do not likely pose an unacceptable health risk to future human receptors assuming the most conservative future land use practices.

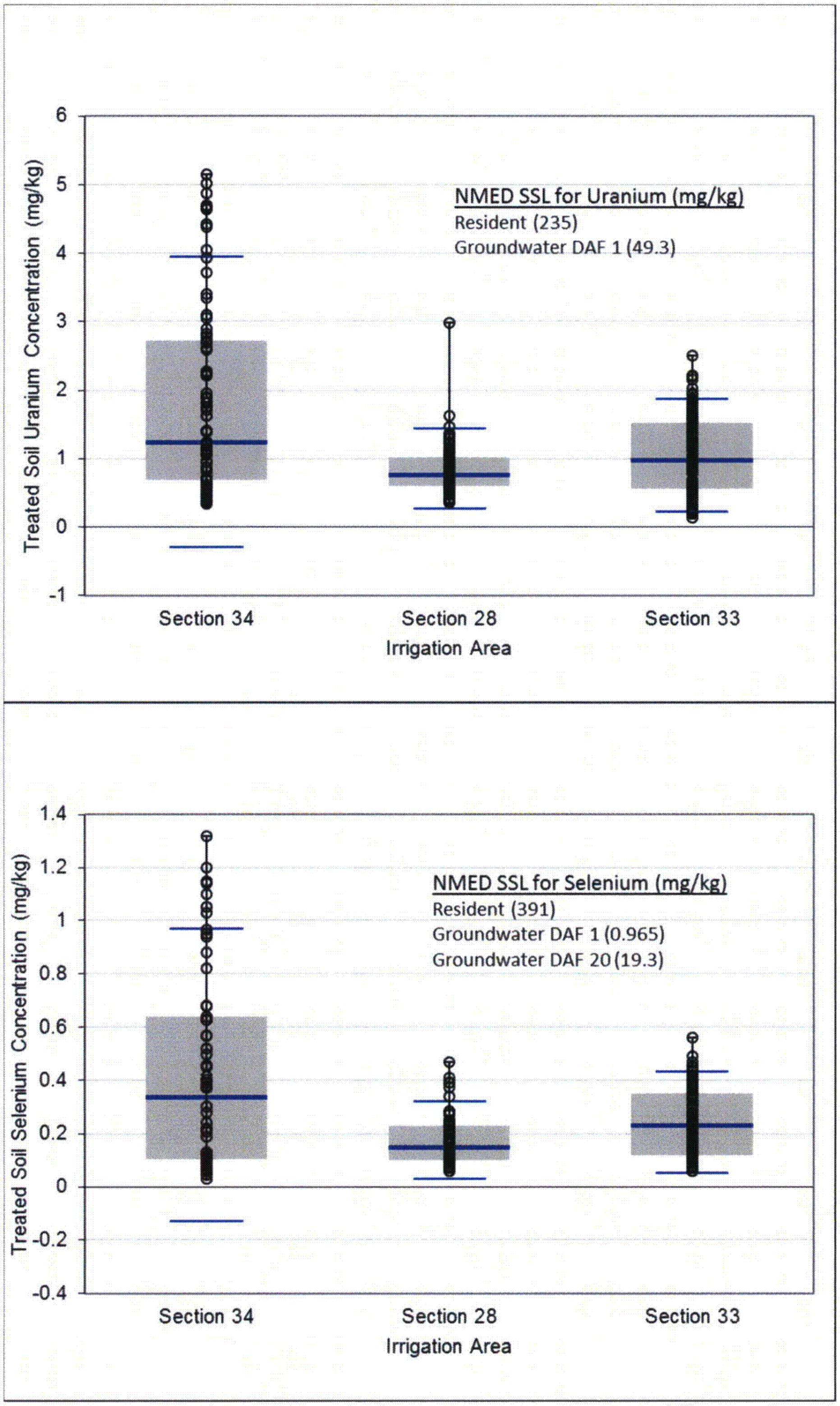


Figure 4-1. Uranium and Selenium Concentrations in Soil with the HMC Irrigation Areas

5. MONITORING PLANS

The monitoring plans include continued ground-water quality monitoring and the continued sampling of operational lysimeters. No additional soil or vegetation sampling is anticipated.

5.1 Section 34

The ground-water monitoring program incorporated in the overall site ground-water monitoring program (wells 555, 556, 557, 844 and 845) will be continued until final site closure. Lysimeters that remain operational may be sampled, but the frequency of sampling will be dependent on soil moisture conditions.

5.2 Section 28

The ground-water monitoring program incorporated in the overall site ground-water monitoring program (wells 881, 882, 884, 886 and 893) will be continued until final site closure. Lysimeters that remain operational may be sampled, but the frequency of sampling will be dependent on soil moisture conditions.

5.3 Section 33

The ground-water monitoring program incorporated in the overall site ground-water monitoring program (wells 551, 553, 554, 647, 649, 650 and 658) will be continued until final site closure. Lysimeters that remain operational may be sampled, but the frequency of sampling will be dependent on soil moisture conditions.

6. CONCLUSIONS

The major actions in the irrigation area closure plan are the removal of center pivots, removal of gated pipe, removal of unused surface piping, and removal of unused above-ground power supplies. Before any equipment or materials are released from the site, the equipment will be spot checked internally and externally using site procedures to confirm that levels of radioactive material on the surface of the equipment are below site release criteria. All non-releasable equipment and materials removed from the irrigation areas will be disposed of properly On-Site.

The post-closure topography in the irrigation areas will not be changed. The existing surface drainage system and patterns do not require modification. In order to preserve existing vegetation, unnecessary surface disturbance will be avoided. Roads are planned to be preserved until the completion of final closure in order to access monitoring wells and active ground-water restoration systems.

The potential post-closure land uses are essentially the same as those for the surrounding area. The irrigation system operation has not resulted in any restrictions on post-closure land use.

7. REFERENCES

Environmental Restoration Group and Hydro-Engineering, 1999, Evaluation of the Use of Alluvial Ground Water for Irrigation, Consulting Report for Homestake Mining Company, Grants, New Mexico.

Environmental Restoration Group and Hydro-Engineering, 2014, Evaluation of the Year 2000 Through 2013 Irrigation with Alluvial Ground Water, Consulting Report for Homestake Mining Company, Grants, New Mexico.

NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation. February 2012. New Mexico Environment Department

Attachment A. 2014 Irrigation Data

Attachment A

2014 Irrigation Data

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Tables

A.1-1 2014 Irrigation Data

The following presents HMC's data that was collected during 2014 in the former irrigation areas. Figures A.1-1 and A.1-2 shows former irrigation areas and the soil sample, lysimeter and moisture equipment locations for 2014.

Table A.2-1 gives the 2014 soil data for the former irrigation areas and the historical soil data collected at these locations. Figures A.2-1 and A.2-2 present the uranium and selenium soil concentration depth plots for the Section 34 former flood area. Figures A.2-3 through A.2-6 present the soil depth plots for the Section 28 and Section 33 former irrigation areas. Land application soil data in 2014 was collected in a manner consistent with past years. Because it provides a continuous record of constituent of concern (COC) concentrations in the soil profile, this soil data is considered more useful than the data collection required in DP-200 Condition 38. The soil COC concentration profiles presented in the figures show consistent concentrations between 2014 and 2012. These results fit with the model prediction that indicates that concentrations in the soil are not expected to change much with time. It also fits the results from the lysimeter soil moisture concentrations. Because the COC concentrations in the soil profile are relatively stable and future changes are expected to be very slow, no additional soil concentration measurements are warranted in the land application areas. Therefore, the requirement to conduct additional soil sampling in the land application areas is requested to be removed from Condition 38.

Condition 36 of DP-200 requires continued monitoring of soil moisture with lysimeters, and the 2014 soil moisture lysimeter concentrations are presented in Tables A.3-1 and A.3-2 along with the historical data collected from these lysimeters. Plots of these lysimeter concentrations are updated in Figures A.3-1 through A.3-22 and show that the Section 34 flood area soil moisture concentrations have been fairly steady in 2014. Uranium concentrations in the soil moisture in the alluvial material above the Section 28 basalt declined in 2014 after two years without irrigation in this area. Uranium concentrations in Sections 28 and 33 soil moisture are expected to remain small in the future reflecting very limited downward migration in soil moisture.

Samples have been collected relative to DP-200 Condition 37 for the 2014 land application ground-water quality monitoring. These results will be presented and analyzed in the Annual Performance report.

Data plots from the soil moisture instruments for the Sections 34 and 28 former irrigation areas are presented in Figures A.4-1 through A.4-6. Data from these soil moisture instruments have been collected since July of 2012 and Condition 39 of DP-200 requires continued maintenance of these instruments. However, since irrigation has been discontinued, these instruments do not have the potential to produce useful information. Therefore the requirement to monitor these instruments is requested to be removed from Condition 39.

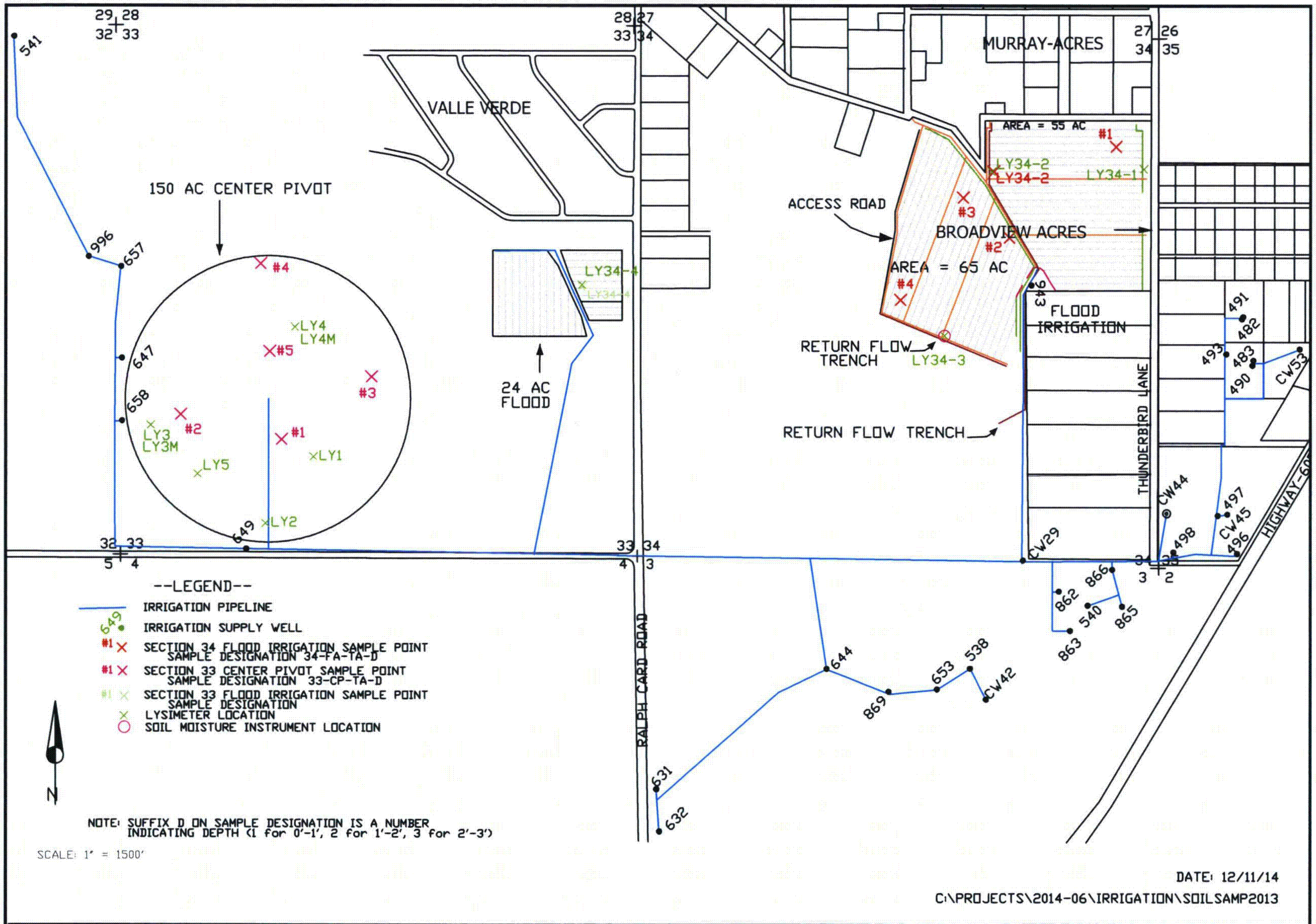

FIGURE A.1-1. SECTION 33 AND 34 FORMER IRRIGATION AREAS WITH SOIL SAMPLE, LYSIMETER, AND SOIL MOISTURE LOCATIONS

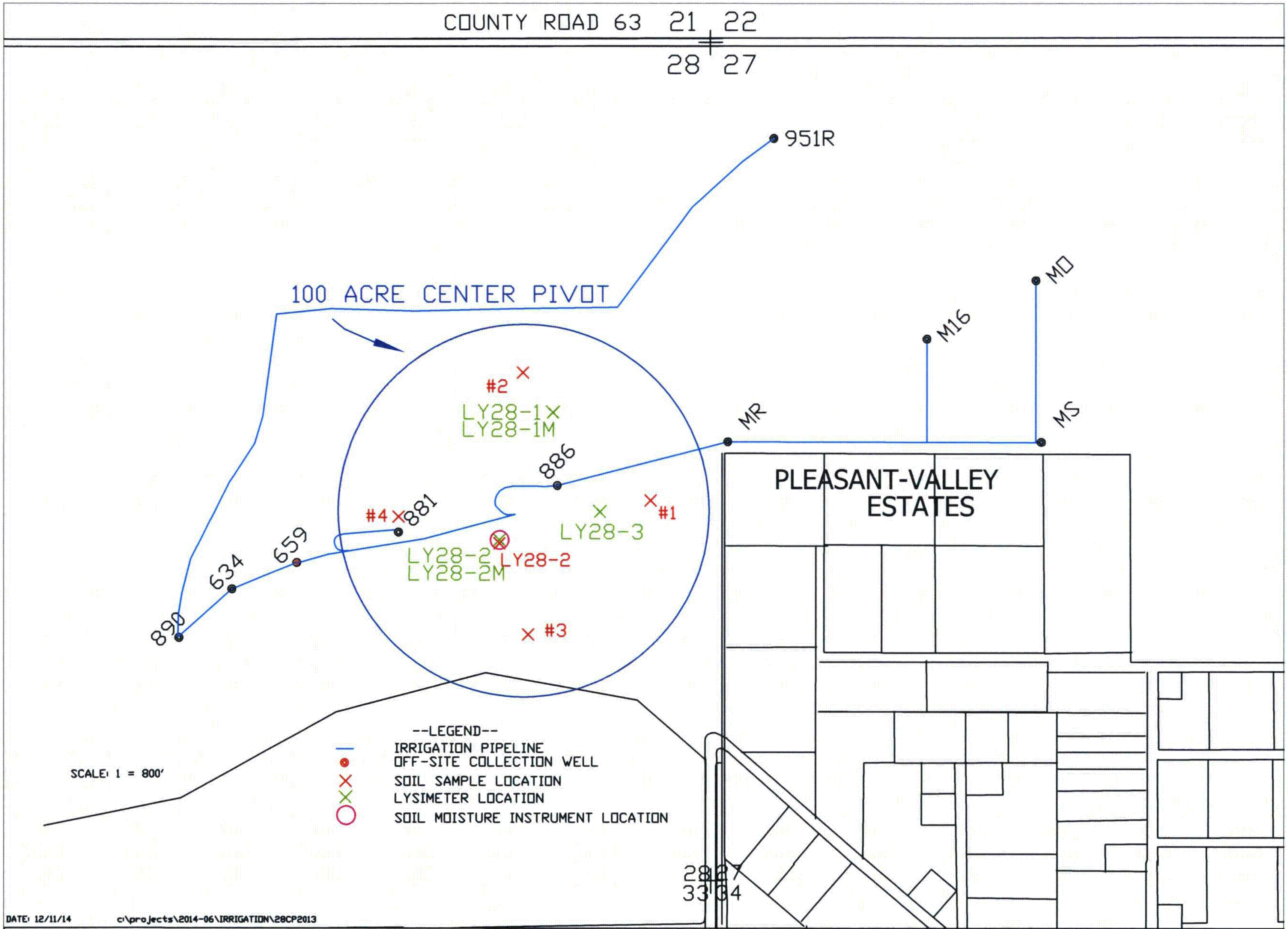

FIGURE A.1-2. SECTION 28 FORMER IRRIGATION AREA WITH SOIL SAMPLE, LYSIMETER, AND SOIL MOISTURE LOCATIONS

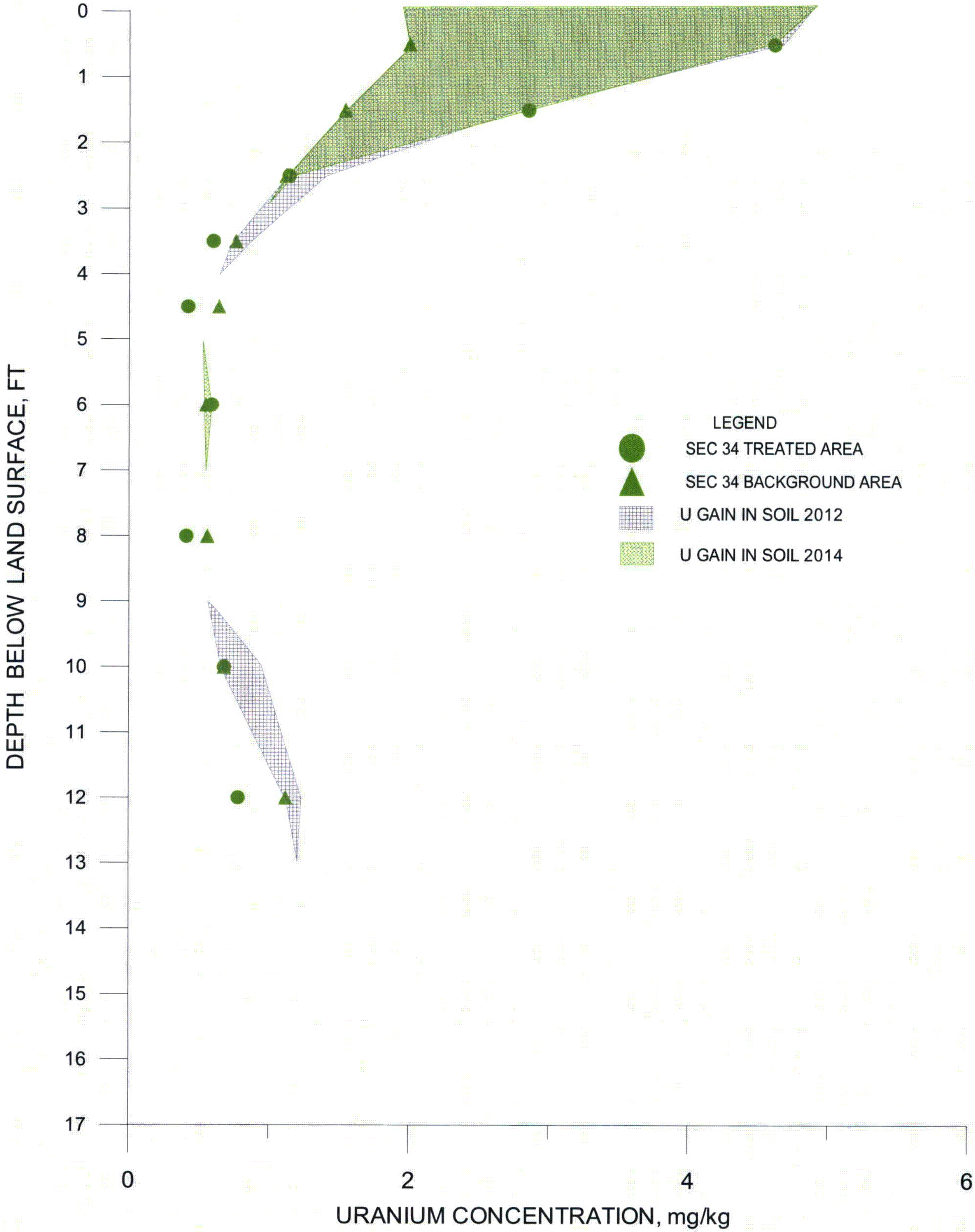

FIGURE A.2-1. URANIUM CONCENTRATION IN THE SOILS WITH DEPTH IN SECTION 34 IRRIGATION AREA

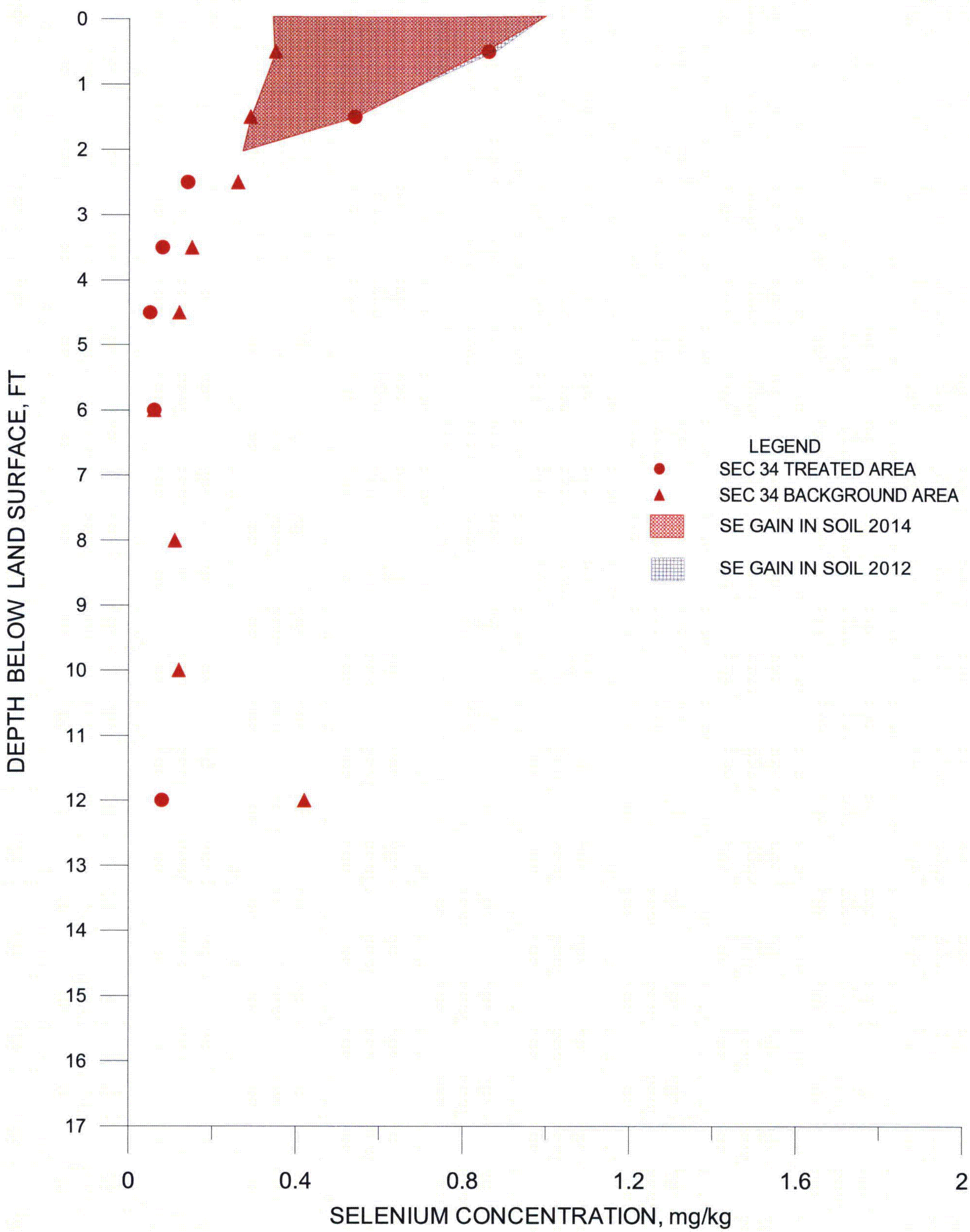

FIGURE A.2-2. SELENIUM CONCENTRATION IN THE SOILS WITH DEPTH IN SECTION 34 IRRIGATION AREA

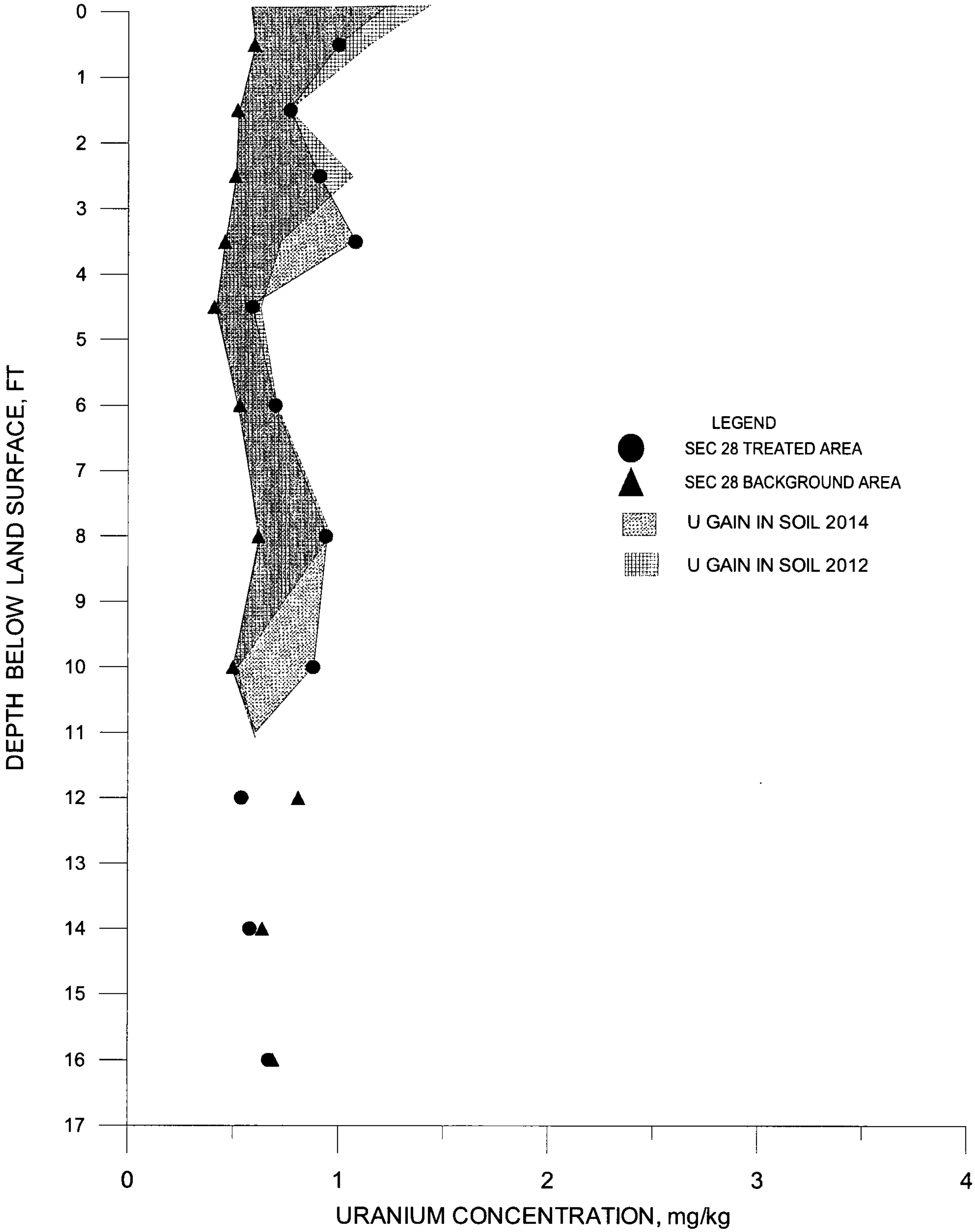

FIGURE A.2-3. URANIUM CONCENTRATION IN THE SOILS WITH DEPTH IN SECTION 28 IRRIGATION AREA

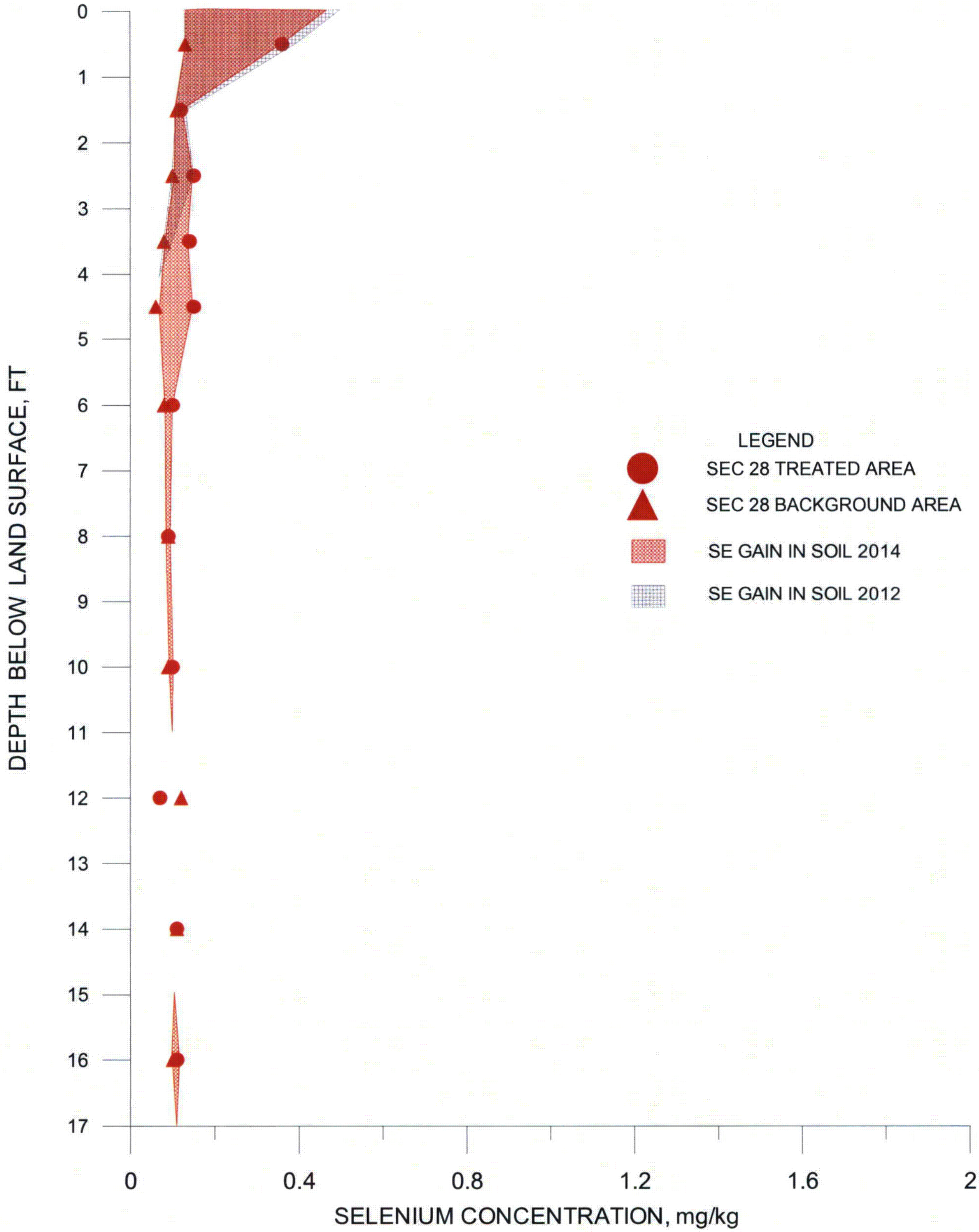

FIGURE A.2-4. SELENIUM CONCENTRATION IN THE SOILS WITH DEPTH IN SECTION 28 IRRIGATION AREA

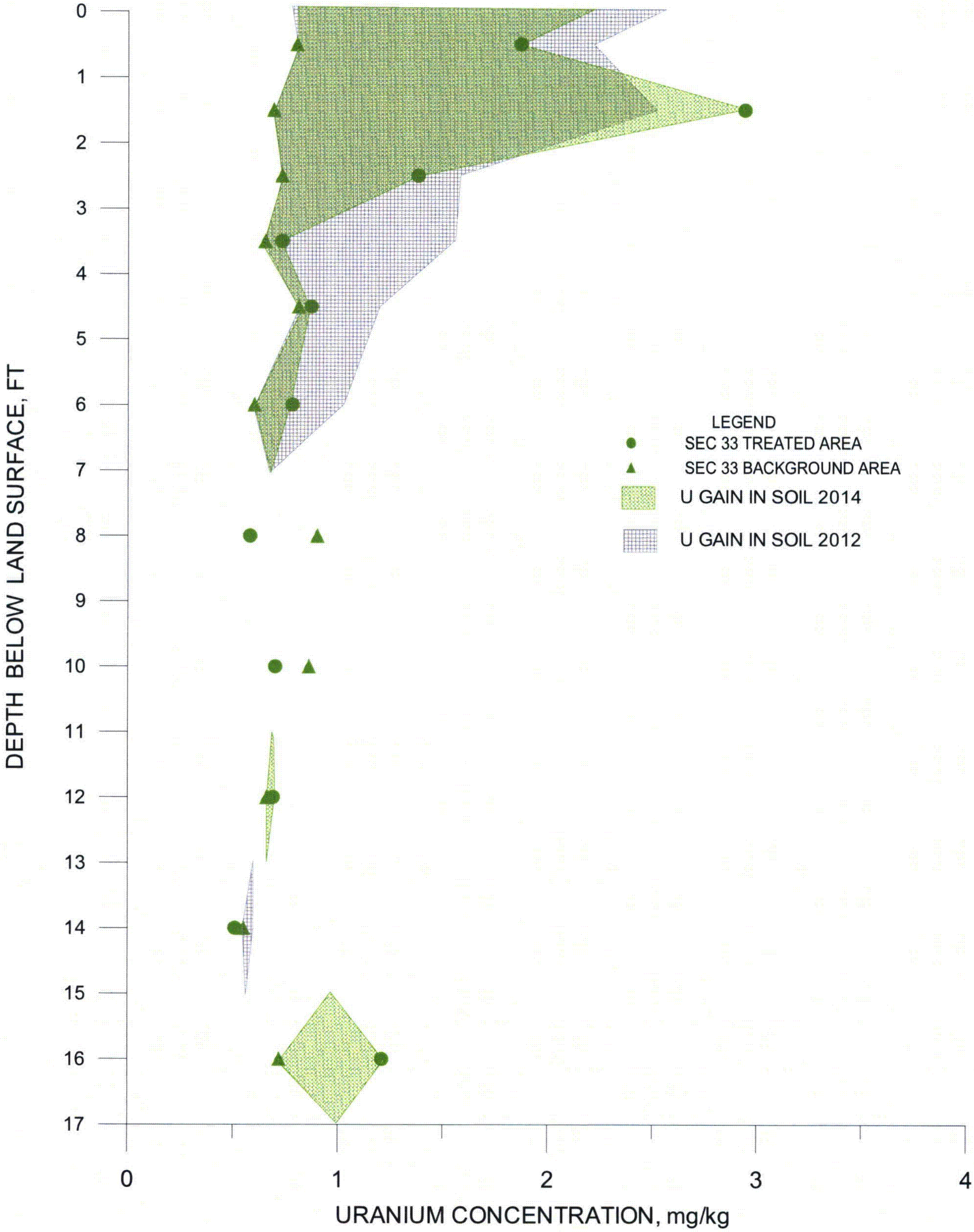

FIGURE A.2-5. URANIUM CONCENTRATION IN THE SOILS WITH DEPTH IN SECTION 33 IRRIGATION AREAS

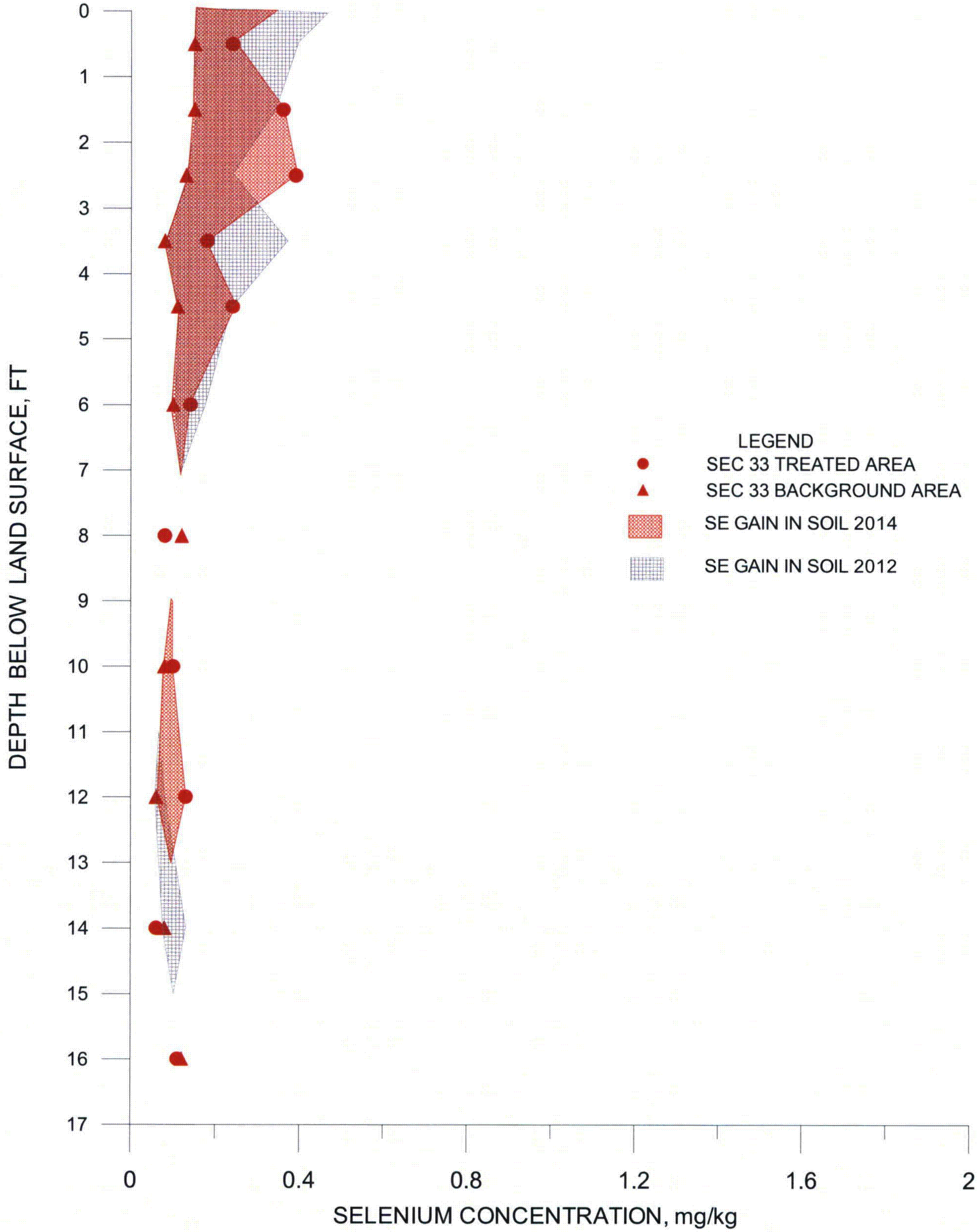

FIGURE A.2-6. SELENIUM CONCENTRATION IN THE SOILS WITH DEPTH IN SECTIONS 33 IRRIGATION AREA

Table A.2-1. Irrigation Soil Analyses, 2000 through 2014

Sample Site	Date	U (mg/kg)	Se (mg/kg)	Mo (mg/kg)	pH (units)	Cond. (mmhos/cm)	Ca (meq/l)	Mg (meq/l)	Na (meq/l)	SAR (ratio)	Cl (mg/kg)	SO4 (mg/kg)
						SECTION 34 FLOOD						
F-1	12/7/2000	3.35	0.68	<1	7.7	2.594	11.95	4.66	14.58	5.03	56	767
	8/8/2001	2.72	0.50	2	7.8	5.090	10.90	3.17	13.50	5.09	182	900
	11/22/2002	0.69	<0.6	<1	7.9	1.050	4.73	1.47	5.26	2.99	18	800
	11/26/2003	3.72	0.82	1	7.8	4.570	22.50	9.62	31.60	7.89	284	2620
	11/4/2004	4.43	1.15	2	7.7	5.220	20.50	8.98	40.40	10.52	398	680
	11/19/2005	3.94	1.10	2	8.0	5.420	20.80	8.64	37.60	9.80	416	5190
	10/28/2006	4.88	0.95	<1	7.9	3.500	12.20	5.72	22.90	7.65	445	5210
	11/10/2007	5.02	1.32	2	7.8	4.910	17.50	8.05	35.00	9.79	429	4400
	12/3/2008	4.38	1.14	1	7.7	4.430	19.40	9.10	33.40	8.85	392	7700
	10/8/2009	4.06	0.97	4	7.8	4.64	19.34	8.50	30.29	8.03	279	4002
	11/5/2010	4.64	1.05	5	7.8	4.11	18.90	8.52	24.30	6.56	219	7000
	10/19/2011	5.15	1.03	2	7.9	3.13	12.40	5.74	19.00	6.31	254	7700
	11/13/2012	4.67	0.88	1	7.9	3.96	14.80	6.75	27.30	8.32	317	7900
	12/18/2013	4.70	1.20	<1	7.8	6.56	25.80	10.80	49.50	11.60	276	4450
	10/15/2014	4.61	0.86	<2	7.9	5.12	19.90	8.01	33.50	9.00	271	5630
F-2	12/7/2000	2.22	0.37	<1	7.6	3.237	14.42	6.01	18.58	5.85	78	1497
	8/8/2001	1.88	0.40	2	7.6	4.970	8.20	2.25	8.57	3.75	139	1400
	11/22/2002	0.46	<0.6	<1	8.0	1.030	3.85	1.12	6.06	3.84	10	200
	11/26/2003	1.90	0.40	<1	7.8	5.020	25.20	8.01	33.60	8.25	396	2480
	11/4/2004	2.27	0.63	<1	7.6	5.370	23.80	7.90	40.50	10.17	390	370
	11/19/2005	1.41	0.38	1	7.9	4.890	20.50	5.55	32.60	9.03	352	3980
	10/28/2006	2.25	0.45	<1	7.6	3.610	12.90	4.34	23.30	7.94	478	4230
	11/10/2007	3.05	0.94	<1	7.7	5.770	21.20	8.24	40.60	10.60	560	4000
	12/3/2008	2.70	0.68	1	7.8	4.240	21.60	8.16	30.00	7.78	406	4900
	10/8/2009	2.59	0.63	3	7.8	4.62	20.06	7.64	29.49	7.85	388	4082
	11/5/2010	2.83	0.57	3	7.7	4.56	22.10	6.32	26.60	7.06	236	3600
	10/19/2011	2.90	0.57	<1	7.7	4.14	16.00	6.23	26.30	7.89	456	8200
	11/13/2012	2.78	0.52	<1	7.8	2.64	9.99	3.74	15.50	5.92	373	6300
	12/18/2013	3.10	<1	<1	7.6	6.83	28.30	9.30	50.10	11.50	465	3840
	10/15/2014	2.85	0.54	<2	7.8	5.87	21.90	7.47	41.00	11.00	415	4290
F-3	12/7/2000	1.62	0.03	<1	7.6	3.397	13.63	5.02	22.21	6.75	56	980
	8/8/2001	1.15	0.30	<1	7.6	5.960	10.10	3.25	9.83	3.80	170	1800
	11/22/2002	0.42	<0.6	<1	8.0	0.930	3.63	1.53	4.90	3.05	3	<100
	11/26/2003	1.08	0.19	<1	7.8	4.420	23.90	6.53	25.80	6.61	302	1550
	11/4/2004	1.40	0.37	<1	7.6	4.800	25.30	7.39	34.90	8.63	166	210
	11/19/2005	2.62	0.68	2	8.0	4.550	17.40	5.78	32.90	9.66	560	5840
	10/28/2006	1.21	0.28	<1	7.5	3.860	18.50	5.18	23.20	6.74	302	2340
	11/10/2007	1.75	0.64	<1	7.6	5.280	24.20	6.25	32.70	8.38	337	1700
	12/3/2008	1.71	0.37	<1	7.8	4.410	23.00	8.99	32.50	8.13	227	1810
	10/8/2009	1.82	0.46	3	7.7	4.66	23.09	7.41	26.51	6.83	430	3362
	11/5/2010	1.96	0.39	2	7.7	4.09	24.40	5.54	20.10	5.19	256	1500
	10/19/2011	1.13	0.22	<1	7.4	4.90	21.60	7.64	30.30	7.92	301	3400
	11/13/2012	1.40	0.24	<1	7.8	3.46	13.30	4.05	22.60	7.67	459	3300
	12/18/2013	1.40	<1	<1	7.6	7.21	33.90	8.20	46.70	10.20	565	2210
	10/15/2014	1.14	0.14	<2	7.6	5.32	22.00	5.91	36.10	9.70	296	1920
F-4	10/8/2009	0.95	0.21	3	7.7	3.49	19.12	5.37	17.90	5.32	268	2151
	11/5/2010	0.87	0.13	2	7.6	3.33	20.00	6.07	15.50	4.29	125	780
	10/19/2011	0.81	0.07	1	7.4	4.96	23.50	7.93	27.50	6.94	309	1700
	11/13/2012	0.88	0.12	<1	7.7	4.29	21.40	6.41	25.40	6.81	287	2400
	12/18/2013	<1	<1	<1	7.5	5.49	28.30	7.70	31.70	7.50	209	1340
	10/15/2014	0.60	0.08	<2	7.5	4.85	22.90	6.37	28.00	7.30	151	1270
F-5	10/8/2009	0.56	0.08	2	7.8	3.11	15.88	4.81	15.79	4.91	138	861
	11/5/2010	0.59	0.09	2	7.6	3.66	26.00	7.46	15.80	3.86	67	1800
	10/19/2011	0.44	<0.05	<1	7.6	3.78	20.70	8.38	17.10	4.48	199	1500
	11/13/2012	0.50	0.07	<1	7.7	3.30	19.00	5.58	16.40	4.68	171	860
	12/18/2013	<1	<1	<1	7.6	4.58	26.10	8.50	22.80	5.50	154	660
	10/15/2014	0.42	0.05	<2	7.7	3.92	21.30	6.53	21.30	5.70	111	944
F-5-7	10/8/2009	0.35	0.05	1	8.1	1.92	9.71	3.13	9.09	3.90	70	459
	11/5/2010	0.44	0.09	1	7.8	1.83	8.66	3.48	9.02	3.66	33	184
	10/19/2011	0.36	<0.05	2	7.8	7.79	16.30	7.93	11.20	3.22	87	730
	11/13/2012	0.37	<0.05	<1	7.9	1.19	4.91	1.78	5.82	3.18	111	420
	12/18/2013	<1	<1	<1	7.7	2.40	11.10	4.10	10.80	3.90	62	207
	10/15/2014	0.59	0.06	<2	7.9	2.22	5.81	3.17	14.00	6.60	51	446

Table A.2-1. Irrigation Soil Analyses, 2000 through 2014 (cont.)

Sample Site	Date	U (mg/kg)	Se (mg/kg)	Mo (mg/kg)	pH (units)	Cond. (mmhos/cm)	Ca (meq/l)	Mg (meq/l)	Na (meq/l)	SAR (ratio)	Cl (mg/kg)	SO4 (mg/kg)
						SECTION 34 FLOOD						
F-7-9	10/8/2009	0.36	0.05	2	8.1	1.27	4.42	1.77	6.69	4.06	76	568
	11/5/2010	0.47	0.07	2	7.8	1.46	6.01	2.40	7.70	3.75	50	260
	10/19/2011	0.38	<0.05	2	8.1	8.05	3.64	2.09	5.03	2.97	56	177
	11/13/2012	0.37	<0.05	<1	7.6	1.63	6.31	3.19	8.10	3.72	116	430
	12/18/2013	<1	<1	<1	7.7	1.78	6.03	2.90	9.91	4.70	30	187
	10/15/2014	0.41	<0.05	<2	8.0	1.92	5.80	3.40	9.68	4.50	42	279
F-9-11	10/8/2009	0.52	0.10	2	7.9	1.70	7.56	3.13	8.10	3.78	61	540
	11/5/2010	1.12	0.22	2	7.6	2.84	16.40	9.50	11.10	3.08	69	400
	10/19/2011	0.73	0.12	<1	7.7	7.73	11.70	6.27	9.67	3.23	45	430
	11/13/2012	0.96	0.10	<1	7.8	2.18	12.20	6.90	8.31	2.69	97	1560
	12/18/2013	3.40	<1	4	7.6	3.94	24.90	12.80	15.00	3.50	48	1390
	10/15/2014	0.68	<0.05	<2	8.2	1.37	2.61	1.90	7.33	4.90	64	529
F-11-13	10/8/2009	1.06	0.11	2	7.9	2.32	12.66	7.85	8.29	2.85	76	1506
	11/5/2010	0.72	0.13	2	7.7	1.93	8.38	5.34	8.31	3.17	47	260
	10/19/2011	0.68	0.06	2	7.6	7.64	13.60	7.47	8.55	2.63	31	460
	11/13/2012	1.24	0.11	<1	7.8	3.21	19.70	12.50	11.10	2.77	69	2800
	12/18/2013	<1	<1	<1	7.5	4.08	25.50	11.80	17.10	3.90	48	1940
	10/15/2014	0.78	0.08	<2	7.8	3.67	19.10	10.90	15.70	4.10	35	500
F-13-15	10/8/2009	0.61	0.10	2	7.9	1.51	8.60	2.41	5.93	2.53	50	490
	10/15/2014	0.54	0.11	<2	7.8	2.13	6.57	5.09	11.20	4.70	55	385
BG-1	8/8/2001	2.47	0.30	2	7.6	4.160	5.86	1.75	2.87	1.47	100	800
	11/22/2002	0.45	<0.6	<1	7.8	0.460	3.52	0.79	0.37	0.25	7	<100
	11/26/2003	2.33	0.42	<1	7.8	1.680	5.70	2.22	9.60	4.82	83	850
	11/3/2004	2.79	0.75	<1	7.8	2.320	8.67	2.05	13.30	5.74	151	490
	11/19/2005	2.41	0.53	2	7.7	3.230	12.80	3.50	15.40	5.39	400	1360
	10/28/2006	3.06	0.69	<1	7.8	2.200	9.53	2.22	10.60	4.37	253	810
	11/10/2007	3.30	0.74	2	7.7	3.650	19.10	4.81	19.60	5.67	267	800
	12/3/2008	2.52	0.57	1	7.8	2.740	13.70	3.37	15.00	5.13	289	810
	10/30/2009	3.35	0.59	<1	7.8	1.77	7.75	1.77	8.97	4.11	135	570
	11/4/2010	3.27	0.58	3	7.5	2.48	14.00	3.57	9.68	3.27	199	680
BG-2	8/8/2001	1.92	0.20	2	7.5	4.730	7.94	2.60	4.53	1.97	120	300
	12/4/2002	0.53	<0.6	<1	7.8	0.410	3.03	1.06	0.32	0.22	4	<100
	11/26/2003	1.46	0.35	1	7.8	3.290	18.70	8.07	16.90	4.62	131	670
	11/3/2004	2.04	0.68	<1	7.7	4.040	19.70	4.51	26.10	7.50	220	280
	11/19/2005	2.44	0.39	2	7.9	4.460	20.80	4.99	23.90	6.66	349	1040
	10/28/2006	3.93	0.87	<1	7.7	2.400	12.30	2.59	10.90	3.99	219	810
	11/10/2007	2.67	0.78	2	7.7	4.280	21.00	5.02	25.80	7.15	271	1240
	12/3/2008	2.19	0.48	2	7.8	3.260	17.90	4.59	18.50	5.52	257	1040
	10/30/2009	2.15	0.39	1	7.7	2.98	18.50	3.41	14.00	4.23	168	830
	11/4/2010	2.61	0.56	4	7.6	2.34	12.20	2.37	10.60	3.93	284	800
BG-3	8/8/2001	0.79	0.20	<1	7.6	8.200	6.35	2.12	2.77	1.35	120	100
	11/22/2002	0.40	<0.6	<1	7.9	0.360	2.51	1.14	0.35	0.25	4	<100
	11/26/2003	1.66	0.36	<1	7.7	2.460	12.80	5.95	10.70	3.49	141	370
	11/3/2004	2.04	0.40	<1	7.5	4.200	25.90	5.95	24.50	6.14	169	230
	11/19/2005	2.13	0.51	2	7.9	4.160	20.50	5.74	19.00	5.25	354	1280
	10/28/2006	2.29	0.54	<1	7.8	3.000	15.00	3.17	15.40	5.11	259	1040
	11/10/2007	1.64	0.53	<1	7.6	4.420	19.80	5.26	27.60	7.80	246	950
	12/3/2008	1.26	0.27	<1	7.7	3.990	22.30	6.24	24.60	6.51	210	1480
	10/30/2009	0.63	0.17	1	7.3	3.33	20.90	4.32	13.40	3.77	159	410
	11/4/2010	1.69	0.42	3	7.5	2.28	11.60	2.66	9.78	3.66	265	560
BG-4	10/30/2009	0.55	0.10	<1	7.4	3.73	27.50	5.50	12.90	3.18	135	1720
	11/4/2010	0.56	0.17	1	7.5	2.06	8.65	2.55	10.10	4.27	105	200
BG-5	10/30/2009	0.33	0.04	<1	7.8	1.65	9.96	2.54	5.51	2.20	55	189
	11/4/2010	0.52	0.11	1	7.5	4.12	30.00	9.14	14.10	3.19	156	810
BG-5-7	10/30/2009	0.31	0.04	<1	7.9	1.04	4.76	1.53	4.18	2.36	33	190
	11/4/2010	0.52	0.09	2	7.6	3.04	16.80	9.48	11.00	3.03	79	330
BG-7-9	10/30/2009	0.93	0.09	<1	7.8	2	7.60	5.49	8.97	3.51	84	360
	11/4/2010	0.81	0.12	1	7.7	1.83	7.24	5.11	7.77	3.13	51	230
BG-9-11	10/30/2009	1.11	0.17	<1	7.7	3.95	18.90	12.40	17.60	4.45	139	520
	11/4/2010	0.91	0.11	2	7.8	2.48	7.39	4.99	14.00	5.63	100	360
BG-11-13	10/30/2009	1.26	1.31	<1	7.8	5.2	22.10	15.90	28.90	6.63	150	1610
	11/4/2010	1.23	0.14	3	7.7	4.12	19.70	10.60	23.40	6.01	63	790
BG-13-15	10/30/2009	0.96	0.53	<1	7.8	3.33	12.60	9.96	18.80	5.60	57	400
BG-15-17	10/30/2009	0.97	0.27	<1	7.9	4.38	21.30	14.70	23.70	5.59	62	950

Table A.2-1. Irrigation Soil Analyses, 2000 through 2014 (cont.)

Sample Site	Date	U (mg/kg)	Se (mg/kg)	Mo (mg/kg)	pH (units)	Cond. (mmhos/cm)	Ca (meq/l)	Mg (meq/l)	Na (meq/l)	SAR (ratio)	Cl (mg/kg)	SO4 (mg/kg)
						SECTION 28 CENTER PIVOT						
N-1	11/19/2002	2.99	<0.6	2	7.7	4.27	20.80	9.40	26.90	6.92	48	3700
	11/24/2003	0.81	0.18	<1	7.8	1.95	8.47	3.94	10.00	4.01	24	400
	11/11/2004	0.89	0.37	<1	7.6	2.67	14.60	6.38	14.00	4.32	28	70
	11/15/2005	0.68	0.17	<1	7.9	2.65	13.90	6.55	11.40	3.57	42	430
	10/21/2006	1.11	0.16	2	7.6	2.37	12.70	6.20	9.35	3.04	57	280
	11/10/2007	1.14	0.47	<1	7.7	2.50	14.00	6.18	10.90	3.43	34	490
	11/22/2008	1.17	0.39	1	7.9	2.90	16.90	8.44	13.40	3.73	48	760
	10/9/2009	1.62	0.41	2	7.8	3.69	18.18	8.96	18.14	4.87	117	895
	11/3/2010	1.37	0.27	2	7.8	4.29	23.00	11.50	24.00	5.78	24	230
	10/20/2011	0.73	0.22	<1	7.3	2.45	21.00	6.58	5.32	1.43	17	500
	11/12/2012	1.15	0.39	1	7.7	1.33	5.90	2.56	5.23	2.54	90	680
	12/17/2013	<1	<1	<1	7.6	4.10	29.20	10.20	13.30	3.00	54	1020
	10/14/2014	1.00	0.36	<2	7.5	3.32	23.30	6.51	11.00	2.90	50	574
N-2	11/19/2002	1.47	<0.6	<1	7.7	4.51	20.60	7.60	29.00	7.72	68	3400
	11/24/2003	0.70	0.16	<1	7.9	2.42	9.47	3.73	15.70	6.11	49	450
	11/11/2004	0.80	0.23	<1	7.7	2.63	11.50	4.60	16.20	5.71	61	70
	11/15/2005	0.74	0.15	<1	7.9	4.09	15.70	7.75	26.60	7.77	87	330
	10/21/2006	1.14	0.09	2	7.7	2.56	12.50	6.43	12.90	4.16	18	610
	11/10/2007	1.01	0.34	<1	7.6	3.11	17.60	8.91	15.00	4.12	37	500
	11/22/2008	1.01	0.24	1	7.8	3.27	18.40	9.17	16.40	4.42	35	870
	10/9/2009	1.12	0.19	1	7.8	3.57	20.66	10.80	15.65	3.97	65	1011
	11/3/2010	1.24	0.20	2	7.5	4.13	22.00	11.00	20.60	5.07	121	890
	10/20/2011	0.78	0.13	<1	7.6	2.18	18.50	7.14	3.73	1.04	11	770
	11/12/2012	0.77	0.13	<1	7.7	1.88	11.70	4.71	5.59	1.95	29	580
	12/17/2013	<1	<1	<1	7.8	3.58	27.10	13.60	8.91	2.00	15	890
	10/14/2014	0.77	0.12	<2	7.7	2.93	24.90	7.93	6.35	1.60	17	837
N-3	11/19/2002	0.74	<0.6	<1	7.6	4.51	22.90	7.57	26.40	6.76	39	1300
	11/24/2003	0.57	0.13	<1	7.8	2.55	13.20	5.28	13.40	4.41	74	380
	11/11/2004	0.70	0.23	<1	7.6	3.30	17.00	7.29	17.40	4.99	134	70
	11/15/2005	0.58	0.12	<1	7.9	4.29	14.90	7.44	6.00	1.80	118	420
	10/21/2006	1.06	0.08	2	7.8	3.58	15.20	8.21	26.00	7.60	37	670
	11/10/2007	0.92	0.25	<1	7.8	3.46	16.30	8.70	20.60	5.83	37	540
	11/22/2008	1.01	0.25	1	8.0	3.11	15.20	8.55	17.50	5.08	60	910
	10/9/2009	1.24	0.20	1	8.0	4.13	18.94	12.63	23.56	5.72	65	1054
	11/3/2010	1.34	0.23	1	7.7	4.16	18.90	13.80	23.60	5.84	60	720
	10/20/2011	0.75	0.08	1	7.7	2.50	18.90	10.60	5.45	1.42	13	690
	11/12/2012	1.07	0.15	<1	7.6	2.53	16.80	5.89	9.16	2.72	38	930
	12/17/2013	1.30	<1	<1	7.9	4.92	25.20	17.00	26.40	5.70	21	1570
	10/14/2014	0.91	0.15	<2	7.8	3.10	23.30	11.70	6.76	1.60	17	863
N-4	10/9/2009	0.78	0.10	1	8.1	3.47	12.67	9.14	22.18	6.39	50	683
	11/3/2010	1.03	0.15	1	7.9	2.98	11.70	6.84	17.50	5.75	44	560
	10/20/2011	0.76	0.15	<1	7.8	2.75	15.00	10.70	10.70	2.98	19	620
	11/12/2012	0.72	0.10	<1	7.8	1.88	9.28	3.97	7.50	2.91	35	460
	12/17/2013	<1	<1	<1	7.9	4.10	21.20	13.10	20.10	4.90	23	778
	10/14/2014	1.08	0.14	<2	7.9	3.25	20.50	11.80	11.20	1.40	16	640
N-5	10/10/2009	0.83	0.12	3	8.2	3.77	11.46	8.43	27.17	9.22	100	783
	11/3/2010	0.84	0.14	1	7.9	3.26	10.10	5.11	22.80	8.27	60	710
	10/20/2011	0.62	<0.05	<1	8.0	2.49	8.29	6.90	14.50	5.26	40	560
	11/12/2012	0.63	0.06	<1	8.0	1.33	4.37	2.64	6.65	3.55	90	610
	12/17/2013	<1	<1	<1	8.2	1.52	3.28	2.60	9.69	5.60	10	188
	10/14/2014	0.59	0.15	<2	8.2	1.89	5.43	4.17	10.10	1.30	26	385
N-5-7	10/11/2009	0.71	0.08	2	8.2	3.41	9.95	6.13	22.89	9.69	159	604
	11/3/2010	0.71	0.13	1	7.9	3.27	10.30	5.73	21.00	7.42	180	750
	10/20/2011	0.48	<0.05	1	8.0	2.69	7.56	5.29	17.60	6.94	67	690
	11/12/2012	0.71	0.06	<1	8.0	1.83	5.81	3.99	9.22	4.17	70	570
	12/17/2013	1.30	<1	<1	8.0	5.83	20.00	14.70	43.00	10.30	30	1090
	10/14/2014	0.70	0.10	<2	8.2	2.53	6.64	4.10	14.70	6.40	18	385
N-7-9	10/12/2009	0.76	0.10	2	8.0	3.90	14.73	10.58	23.32	6.54	140	871
	11/3/2010	0.61	0.09	2	7.9	2.52	6.57	4.19	16.90	7.29	130	1000
	10/20/2011	0.38	<0.05	<1	8.0	2.66	10.70	7.25	14.40	4.81	58	680
	11/12/2012	0.97	0.09	<1	7.8	3.23	14.20	7.90	17.20	5.17	70	980
	12/17/2013	<1	<1	<1	7.9	4.42	13.50	9.00	31.00	9.20	54	550
	10/14/2014	0.94	0.09	<2	8.1	3.06	7.20	4.35	20.20	8.40	49	731

Table A.2-1. Irrigation Soil Analyses, 2000 through 2014 (cont.)

Sample Site	Date	U (mg/kg)	Se (mg/kg)	Mo (mg/kg)	pH (units)	Cond. (mmhos/cm)	Ca (meq/l)	Mg (meq/l)	Na (meq/l)	SAR (ratio)	Cl (mg/kg)	SO4 (mg/kg)
						SECTION 28 CENTER PIVOT						
N-9-11	10/13/2009	0.47	0.08	2	8.0	3.46	14.26	7.59	18.29	6.13	166	602
	11/3/2010	0.67	0.16	1	7.8	3.26	14.50	9.27	17.00	4.93	69	520
	10/20/2011	0.39	<0.05	<1	7.9	2.58	12.10	9.12	10.80	3.32	71	580
	11/12/2012	0.52	0.07	<1	7.7	2.75	11.50	6.24	13.90	4.67	49	640
	12/17/2013	<1	<1	<1	7.8	6.11	23.70	16.60	41.40	9.20	64	1550
	10/14/2014	0.88	0.10	<2	7.9	4.77	19.40	11.00	28.80	7.40	55	793
N-11-13	10/14/2009	0.53	0.12	1	7.9	2.68	10.01	4.34	15.14	5.88	145	747
	11/3/2010	0.64	0.15	2	7.7	3.35	16.60	7.81	15.00	4.29	151	370
	10/20/2011	0.35	<0.05	<1	7.9	1.86	7.72	3.80	9.00	3.75	83	630
	11/12/2012	0.57	<0.05	<1	7.5	2.48	12.40	5.94	10.40	3.43	28	2700
	12/17/2013	<1	<1	<1	7.7	5.60	26.20	9.10	35.60	8.50	95	777
	10/14/2014	0.54	0.07	<2	8.0	3.65	14.90	9.24	19.00	5.50	80	580
N-13-15	10/15/2009	1.02	0.28	2	7.8	3.40	14.01	6.45	19.97	6.17	136	948
	11/3/2010	0.80	0.24	2	7.7	2.74	13.20	4.90	13.60	4.52	90	440
	10/20/2011	0.40	0.08	<1	7.7	2.29	11.50	4.65	10.30	3.62	84	520
	11/12/2012	0.51	0.07	<1	7.5	2.72	13.20	5.21	13.00	4.28	93	680
	12/17/2013	<1	<1	<1	7.5	4.99	25.10	7.90	31.70	7.80	62	847
	10/14/2014	0.58	0.11	<2	7.8	4.41	24.80	10.80	20.00	4.80	129	1340
N-15-17	10/16/2009	0.41	0.20	2	7.8	3.04	14.16	6.43	16.08	4.75	92	620
	11/3/2010	0.53	0.12	1	7.8	2.08	9.00	3.35	4.51	4.51	70	500
	12/17/2013	<1	<1	<1	7.8	2.41	8.96	2.90	16.00	6.60	54	311
	10/14/2014	0.67	0.11	<2	7.8	2.46	11.50	4.24	10.40	3.70	105	411
BG-1	11/19/2002	2.99	<0.6	2	8.0	0.82	3.33	0.91	4.20	2.88	14	700
	11/24/2003	0.51	0.15	<1	7.9	0.33	1.94	0.61	0.30	0.26	6	60
	11/11/2004	0.88	0.22	<1	7.4	1.16	6.93	1.99	3.91	1.85	12	20
	11/15/2005	0.47	0.12	<1	7.8	1.01	6.37	2.00	2.32	1.13	283	4380
	10/21/2006	0.62	0.10	2	7.7	0.46	2.41	0.71	0.57	0.45	19	80
	11/10/2007	0.78	0.23	<1	7.7	0.71	4.19	1.35	0.95	0.57	32	118
	11/22/2008	0.59	0.15	1	7.8	0.44	2.56	0.77	0.88	0.68	220	1390
	10/15/2009	1.11	0.16	2	7.9	0.507	2.83	0.96	1.10	0.79	60	320
	11/2/2010	0.65	0.16	<1	7.6	1.1	6.39	2.17	2.68	1.30	30	90
BG-2	11/19/2002	1.62	<0.6	<1	7.7	2.00	14.90	3.27	6.88	2.28	13	500
	11/24/2003	0.61	0.10	<1	8.0	0.35	1.69	0.81	0.60	0.53	6	120
	11/11/2004	0.77	0.22	<1	7.4	0.66	4.22	1.42	1.01	0.60	14	<10
	11/15/2005	0.47	0.07	<1	8.0	0.73	3.71	1.58	1.50	0.92	405	5350
	10/21/2006	0.51	<.05	1	7.8	0.53	2.22	0.95	0.89	0.70	14	<50
	11/10/2007	0.91	0.24	<1	7.6	0.95	5.95	2.18	1.45	0.71	26	99
	11/22/2008	0.46	0.15	1	8.0	0.40	2.11	0.89	0.88	0.71	240	1300
	10/15/2009	0.57	0.10	<1	8.0	0.658	3.20	1.31	1.82	1.21	50	300
	11/2/2010	0.40	0.13	<1	7.8	0.53	3.41	1.41	0.71	0.45	40	110
BG-3	11/19/2002	1.45	<0.6	<1	7.8	1.51	9.24	1.95	6.29	2.66	13	500
	11/24/2003	0.53	0.12	<1	8.0	0.53	2.10	1.26	1.80	1.39	11	120
	11/11/2004	0.81	0.19	<1	7.5	0.80	4.74	2.03	1.60	0.86	10	10
	11/15/2005	0.55	0.07	<1	7.9	1.05	5.09	2.43	3.03	1.56	290	4340
	10/21/2006	0.58	0.06	1	7.9	0.44	1.33	0.68	1.25	1.25	16	70
	11/10/2007	0.80	0.25	<1	7.7	0.88	4.99	1.84	1.76	1.95	30	120
	11/22/2008	0.53	0.15	<1	8.1	0.493	1.96	0.95	1.95	1.62	270	1500
	10/15/2009	0.56	0.11	1	8.1	0.708	2.71	1.50	2.33	1.61	70	370
	11/2/2010	0.45	0.13	<1	7.9	0.509	2.72	1.45	0.99	0.68	60	340
BG-4	10/15/2009	0.52	0.07	<1	8.3	0.603	2.22	1.55	1.56	1.14	60	360
	11/2/2010	0.39	0.09	<1	8.0	0.53	2.28	1.44	1.72	1.26	70	440
BG-5	10/15/2009	0.45	0.06	<1	8.4	0.563	1.67	1.27	2.28	1.88	90	620
	11/2/2010	0.36	0.07	<1	8.1	0.34	1.43	0.92	1.09	1.01	80	520
BG-5-7	10/15/2009	0.62	0.08	1	8.3	0.867	2.25	1.74	4.22	2.99	100	600
	11/2/2010	0.43	0.08	<1	8.1	0.542	1.95	1.34	2.19	1.71	90	700
BG-7-9	10/15/2009	0.79	0.08	<1	8.1	1.51	3.73	3.01	7.83	4.27	61	370
	11/2/2010	0.44	0.09	<1	8.1	0.953	2.39	1.72	5.53	3.86	140	1180
BG-9-11	10/15/2009	0.52	0.09	<1	7.9	3.02	12.90	8.38	14.80	4.54	60	420
	11/2/2010	0.48	0.09	<1	7.9	1.51	5.89	3.71	7.19	3.28	40	400
BG-11-13	10/15/2009	0.97	0.12	1	7.8	2.82	19.70	10.40	6.74	1.74	15	540
	11/2/2010	0.65	0.12	<1	8.0	0.827	2.84	1.62	4.06	2.72	30	230
BG-13-15	10/15/2009	0.60	0.08	<1	7.9	0.636	2.77	1.15	1.93	1.38	70	480
	11/2/2010	0.68	0.13	<1	8.0	0.578	2.17	1.10	2.57	2.01	50	320
BG-15-17	10/15/2009	0.84	0.10	<1	7.9	1.27	4.48	1.79	6.25	3.53	70	560
	11/2/2010	0.54	0.09	<1	7.9	0.793	2.63	1.18	4.01	2.91	40	400

Table A.2-1. Irrigation Soil Analyses, 2000 through 2014 (cont.)

Sample Site	Date	U (mg/kg)	Se (mg/kg)	Mo (mg/kg)	pH (units)	Cond. (mmhos/cm)	Ca (meq/l)	Mg (meq/l)	Na (meq/l)	SAR (ratio)	Cl (mg/kg)	SO4 (mg/kg)
						SECTION 33 CENTER PIVOT						
P-1	12/7/2000	0.93	0.37	<1	7.9	0.987	4.00	1.27	5.67	3.40	26	98
	6/15/2001	0.94	0.30	<1	8.0	1.230	3.77	1.48	7.48	4.84	123	500
	11/20/2002	0.98	<0.6	<1	7.8	1.610	7.71	2.80	8.10	3.53	13	300
	11/18/2003	1.36	0.28	<1	7.8	2.200	7.99	3.25	13.50	5.69	55	590
	11/9/2004	1.78	0.45	<1	7.6	3.780	19.70	8.73	21.40	5.67	101	190
	11/5/2005	1.45	0.31	<1	8.1	2.060	9.35	4.02	11.20	4.33	51	460
	10/21/2006	1.87	0.36	<1	7.8	3.560	15.80	6.36	20.40	6.13	109	1020
	11/10/2007	1.67	0.44	<1	7.7	3.280	12.40	5.91	19.10	6.31	85	600
	11/22/2008	1.41	0.41	1	8.0	2.630	10.70	5.07	17.10	6.09	80	500
	10/6/2009	2.03	0.41	2	7.8	3.472	14.63	6.95	22.75	6.71	147	1059
	12/2/2010	1.87	0.35	<1	8.0	3.900	18.00	7.96	23.70	6.58	101	910
	10/17/2011	1.56	0.42	2	7.7	5.240	17.30	10.10	37.40	10.10	202	940
	11/14/2012	2.22	0.40	<1	8.3	4.230	21.70	10.70	22.90	5.69	69	2100
	12/16/2013	2.20	<1	<1	7.6	4.450	24.40	12.10	21.40	5.00	51	1310
	10/13/2014	1.87	0.24	<2	7.7	5.050	21.10	9.41	30.90	7.90	166	960
P-2	12/7/2000	0.81	0.45	<1	7.8	1.480	6.30	1.88	7.77	3.84	46	290
	6/15/2001	0.60	0.30	<1	7.9	1.120	4.32	1.45	6.11	3.60	109	500
	11/20/2002	0.89	<0.6	<1	7.8	2.190	10.10	3.78	13.10	4.97	14	600
	11/18/2003	1.14	0.19	<1	7.9	2.690	10.30	3.86	16.10	6.05	82	710
	11/9/2004	1.52	0.39	<1	7.6	4.300	19.40	10.80	27.50	7.07	155	200
	11/5/2005	1.15	0.21	2	8.1	3.940	15.10	7.68	27.30	8.09	94	420
	10/21/2006	1.62	0.15	<1	7.7	3.320	14.20	5.93	17.90	5.64	142	900
	11/10/2007	1.34	0.30	<1	7.7	5.300	19.60	11.00	37.00	9.46	187	900
	11/22/2008	1.37	0.35	1	8.0	3.600	13.40	6.30	25.80	8.22	114	1130
	10/6/2009	1.84	0.29	2	7.9	3.906	14.45	7.40	30.01	8.53	243	1405
	12/2/2010	2.16	0.25	<1	8.0	4.000	17.40	7.66	25.60	7.23	102	850
	10/17/2011	1.19	0.19	2	7.8	3.900	13.80	7.36	24.80	7.62	177	950
	11/14/2012	2.51	0.34	<1	8.1	4.490	13.00	8.02	32.70	10.10	195	3700
	12/16/2013	1.60	<1	<1	7.8	5.610	21.80	14.20	36.00	8.50	133	1530
	10/13/2014	2.94	0.36	<2	7.8	7.520	21.70	13.80	56.20	13.00	445	3550
P-3	12/7/2000	1.03	0.25	<1	7.6	1.720	8.35	2.29	8.33	3.71	36	210
	6/15/2001	0.54	0.10	<1	7.8	1.020	4.74	2.18	4.27	2.30	67	400
	11/20/2002	0.68	<0.6	<1	7.7	2.400	11.70	5.34	11.60	3.97	34	1000
	11/18/2003	1.00	0.18	<1	7.8	2.970	15.50	5.67	17.30	5.32	106	570
	11/9/2004	1.15	0.38	<1	7.6	3.440	15.90	9.31	19.30	5.43	137	220
	11/5/2005	1.00	0.30	1	8.0	4.500	18.70	10.50	147.00	38.50	197	580
	10/21/2006	1.05	0.14	<1	7.8	3.500	13.90	6.17	19.70	6.22	126	780
	11/10/2007	1.30	0.39	<1	7.6	4.670	20.30	10.60	26.40	6.72	174	670
	11/22/2008	1.27	0.33	3	7.9	3.600	14.80	7.10	23.10	6.98	184	1220
	10/6/2009	1.52	0.28	2	7.8	4.271	16.22	7.79	28.20	7.85	279	972
	12/2/2010	1.95	0.24	<1	8.0	3.910	17.00	8.06	24.40	6.89	154	1360
	10/17/2011	0.86	0.18	2	7.8	4.660	14.20	7.77	33.30	10.00	179	570
	11/14/2012	1.58	0.24	<1	7.9	3.950	14.40	7.64	25.00	7.53	302	1600
	12/16/2013	1.20	<1	<1	7.8	5.870	22.70	16.40	38.90	8.80	139	2590
	10/13/2014	1.38	0.39	<2	7.8	7.450	19.60	13.40	58.30	14.00	295	1770
P-4	10/6/2009	1.32	0.27	2	7.8	4.113	17.19	7.87	24.92	7.17	258	911
	12/2/2010	1.52	0.26	<1	8.0	3.750	18.90	7.76	20.80	5.70	170	870
	10/17/2011	0.66	0.18	2	7.8	3.150	13.90	6.25	17.40	5.48	93	670
	11/14/2012	1.55	0.37	<1	7.9	3.650	17.20	7.90	19.20	5.42	550	2300
	12/16/2013	1.40	<1	<1	7.6	4.580	25.40	11.20	16.70	3.90	531	982
	10/13/2014	0.73	0.18	<2	8.0	4.550	11.90	9.22	29.60	9.10	171	457
P-5	10/6/2009	1.20	0.27	2	7.9	3.426	14.81	7.20	19.76	6.10	163	884
	12/2/2010	1.79	0.33	<1	8.0	3.720	17.10	7.85	21.00	5.95	167	1640
	10/17/2011	0.79	0.17	2	77.0	3.030	15.10	7.89	14.20	4.19	89	300
	11/14/2012	1.20	0.24	<1	7.8	2.660	17.10	7.14	7.64	2.19	299	860
	12/16/2013	1.50	<1	<1	7.5	5.030	35.30	12.40	11.70	2.40	612	1210
	10/13/2014	0.87	0.24	<2	7.8	5.060	21.90	12.80	25.60	6.10	343	1370
P-5-7	10/6/2009	0.95	0.20	2	7.9	2.799	11.03	5.33	17.07	5.78	145	696
	12/2/2010	0.89	0.16	<1	8.0	2.640	12.50	5.72	13.00	4.31	91	670
	10/17/2011	0.51	0.10	2	7.9	1.040	4.16	1.88	4.11	2.37	133	600
	11/14/2012	1.02	0.18	<1	7.9	2.040	12.70	4.97	6.13	2.06	212	870
	12/16/2013	<1	<1	<1	7.6	2.630	15.60	5.40	7.30	2.30	227	407
	10/13/2014	0.78	0.14	<2	7.6	1.750	8.87	3.97	4.28	1.70	203	449
P-7-9	10/6/2009	0.85	0.22	2	7.8	2.198	11.01	5.23	10.78	3.71	85	557
	12/2/2010	0.67	0.10	<1	8.1	1.850	8.26	3.23	8.05	3.36	72	400
	10/17/2011	0.48	0.07	2	8.1	1.42	3.76	2.77	7.36	4.07	126	350
	11/14/2012	0.49	<0.05	<1	8.1	0.649	2.96	0.97	2.08	1.48	90	620
	12/16/2013	<1	<1	<1	7.7	1.49	7.59	2.50	5.62	2.50	29	204
	10/13/2014	0.58	0.08	<2	7.7	1.36	7.68	2.48	2.29	1.00	76	121

Table A.2-1. Irrigation Soil Analyses, 2000 through 2014 (cont.)

Sample Site	Date	U (mg/kg)	Se (mg/kg)	Mo (mg/kg)	pH (units)	Cond. (mmhos/cm)	Ca (meq/l)	Mg (meq/l)	Na (meq/l)	SAR (ratio)	Cl (mg/kg)	SO4 (mg/kg)
SECTION 33 CENTER PIVOT												
P-9-11	10/6/2009	0.93	0.19	2	7.9	2.086	13.89	6.24	6.12	1.97	86	619
	12/2/2010	0.67	0.10	1	7.9	2.680	13.10	4.05	4.63	1.58	59	370
	10/17/2011	0.58	0.11	2	7.9	2.800	9.66	7.28	14.10	4.84	87	420
	11/14/2012	0.62	0.06	<1	8.0	0.632	2.78	0.97	2.36	1.74	110	700
	12/16/2013	<1	<1	<1	7.6	1.670	9.24	3.00	5.63	2.30	35	251
	10/13/2014	0.70	0.10	<2	7.7	1.320	6.73	1.93	3.31	1.60	74	221
P-11-13	10/6/2009	0.96	0.12	1	8.0	1.449	9.25	4.13	2.86	1.20	83	393
	12/2/2010	0.56	0.10	<1	8.0	1.140	6.69	1.86	2.70	1.31	51	270
	10/17/2011	0.52	0.10	2	7.9	1.15	4.36	2.27	4.68	2.57	122	670
	11/14/2012	0.54	0.08	<1	8.0	1.59	8.60	3.32	6.01	2.46	47	340
	12/16/2013	<1	<1	<1	7.6	1.82	9.67	3.20	6.22	2.50	60	251
	10/13/2014	0.69	0.13	<2	7.7	0.916	4.69	1.24	2.30	0.90	42	198
P-13-15	10/6/2009	0.80	0.14	1	8.0	1.435	9.42	4.24	2.72	1.11	90	329
	12/2/2010	0.61	0.10	<1	8.0	1.440	9.12	2.58	3.47	1.43	36	180
	10/17/2011	0.43	0.12	3	7.5	1.420	6.54	3.23	5.67	2.57	52	420
	11/14/2012	0.59	0.13	<1	7.8	1.250	7.73	3.26	2.64	1.13	120	360
	12/16/2013	<1	<1	<1	7.7	1.310	6.05	2.60	4.85	2.30	42	208
	10/13/2014	0.51	0.06	<2	8.0	0.607	2.51	0.70	1.62	1.30	130	949
P-15-17	10/6/2009	0.83	0.19	1	8.0	1.847	14.18	5.62	3.13	1.01	70	345
	12/2/2010	0.84	0.12	<1	8.0	1.380	9.83	2.73	3.17	1.26	30	160
	10/17/2011	0.50	0.10	2	7.7	1.710	8.29	3.88	6.75	2.74	44	360
	11/14/2012	0.52	0.11	<1	7.9	0.749	3.58	1.62	1.89	1.17	161	250
	12/16/2013	<1	<1	<1	7.8	2.160	9.65	4.90	8.04	3.00	118	305
	10/13/2014	1.21	0.11	<2	7.8	0.434	1.79	0.56	1.10	1.00	70	478
BG-1	12/7/2000	1.14	0.20	<1	7.6	1.240	9.07	2.64	0.64	0.26	18	<50
	6/20/2001	0.98	0.10	1	7.9	0.231	1.51	0.48	0.43	0.43	32	<300
	11/20/2002	0.85	<0.6	<1	7.8	0.450	3.51	0.98	0.69	0.46	<4	<100
	11/18/2003	0.78	0.12	<1	7.8	0.700	4.13	1.15	0.60	0.36	21	160
	11/8/2004	0.88	0.27	<1	7.7	0.980	6.22	1.94	1.83	0.91	28	60
	11/5/2005	0.78	0.18	<1	8.1	0.835	5.20	1.54	1.60	0.87	27	570
	10/21/2006	0.88	0.18	<1	7.9	1.060	6.04	1.69	1.87	0.95	18	160
	11/10/2007	0.89	0.39	<1	7.7	1.510	7.57	2.80	2.03	0.89	68	280
	11/22/2008	0.72	0.21	1	8.0	0.883	6.13	2.12	1.81	0.89	170	820
	10/22/2009	1.02	0.19	<1	7.5	1.08	7.32	2.21	1.78	0.81	33	230
	12/1/2010	1.00	0.17	2	7.8	0.98	6.35	2.22	2.25	1.09	60	440
BG-2	6/20/2001	0.76	0.20	<1	7.9	0.321	1.83	0.92	0.57	0.48	29	<300
	11/20/2002	0.59	<0.6	<1	7.7	1.250	7.58	3.04	3.56	1.54	8	<100
	11/18/2003	0.52	0.12	<1	7.7	0.670	4.27	1.28	0.70	0.42	25	90
	11/8/2004	0.79	0.24	<1	7.8	0.690	4.05	1.45	1.22	0.74	32	70
	11/5/2005	0.69	0.15	<1	8.1	0.745	4.24	1.45	1.41	0.83	71	2140
	10/21/2006	0.88	0.16	<1	8.0	0.757	3.63	1.60	1.47	0.90	21	120
	11/10/2007	0.89	0.44	<1	7.7	1.550	9.46	3.44	2.42	0.95	73	350
	11/22/2008	0.61	0.23	2	8.0	0.809	5.05	2.21	1.73	0.90	160	680
	10/22/2009	0.73	0.15	<1	7.6	1.07	7.78	2.81	1.01	0.43	25	220
	12/1/2010	0.74	0.14	<1	7.9	0.63	3.62	1.65	0.87	0.53	80	320
BG-3	6/20/2001	0.83	0.30	<1	7.9	0.385	2.41	1.12	0.48	0.36	41	300
	11/20/2002	0.66	<0.6	<1	7.9	0.580	3.39	1.32	1.79	1.17	8	300
	11/18/2003	0.67	0.12	<1	7.7	0.620	3.77	1.39	0.70	0.43	22	70
	11/8/2004	0.81	0.26	<1	7.8	0.720	4.13	1.54	1.50	0.89	31	80
	11/5/2005	0.79	0.15	2	8.3	0.607	3.39	1.26	1.23	0.80	222	6770
	10/21/2006	1.09	0.15	<1	8.0	1.080	5.54	2.55	2.20	1.09	16	200
	11/10/2007	0.86	0.27	<1	7.7	1.740	10.60	3.73	2.81	1.05	63	300
	11/22/2008	0.72	0.20	3	8.0	0.877	5.06	2.27	2.37	1.24	180	870
	10/22/2009	0.82	0.13	1	7.7	0.600	3.48	1.36	0.87	0.55	70	370
	12/1/2010	0.86	0.19	1	8.0	0.529	2.55	1.36	1.14	0.81	40	200
BG-4	10/22/2009	1.01	0.15	<1	7.7	0.578	3.33	1.40	0.95	0.61	60	370
	12/1/2010	1.03	0.18	2	8.0	0.656	3.32	1.59	1.58	1.01	50	340
BG-5	10/22/2009	0.90	0.12	<1	7.7	0.692	4.09	1.66	1.15	0.67	60	390
	12/1/2010	0.94	0.17	2	8.0	0.920	4.71	2.31	2.47	1.32	60	330
BG-5-7	10/22/2009	0.52	0.08	<1	7.9	0.508	2.86	1.09	0.80	0.56	70	350
	12/1/2010	0.68	0.11	<1	7.9	0.635	3.53	1.48	1.34	0.84	50	360
BG-7-9	10/22/2009	0.80	0.09	<1	7.6	0.442	2.57	0.87	0.65	0.49	30	240
	12/1/2010	0.99	0.14	1	8.0	0.730	3.96	1.56	2.02	1.22	40	320
BG-9-11	10/22/2009	0.76	0.05	<1	7.6	0.426	2.47	0.81	0.63	0.49	32	230
	12/1/2010	0.99	0.11	2	7.7	1.260	8.78	3.15	2.91	1.19	<30	380
BG-11-13	10/22/2009	0.56	<0.05	<1	7.7	0.335	1.96	0.59	0.55	0.48	40	300
	12/1/2010	0.56	0.06	1	7.7	0.953	5.48	2.08	3.09	1.59	<30	380
BG-13-15	10/22/2009	0.68	0.10	<1	7.6	0.318	1.69	0.50	0.57	0.54	70	540
	12/1/2010	0.42	0.06	1	7.9	0.593	3.13	1.24	1.89	1.28	<30	290
BG-15-17	10/22/2009	0.99	0.14	1	7.7	0.387	2.06	0.68	0.87	0.74	70	530
	12/1/2010	0.45	0.09	1	7.9	0.501	2.74	1.00	1.48	1.08	<30	290

NOTE: 2000 Sample: 1 = 0 - 6 inches, 2 = 6 - 18 inches and 3 = 18 - 36 inches
2001 through 2008 Sample: 1 = 0 - 1 ft, 2 = 1 - 2 ft and 3 = 2 - 3 ft; BG samples are background.

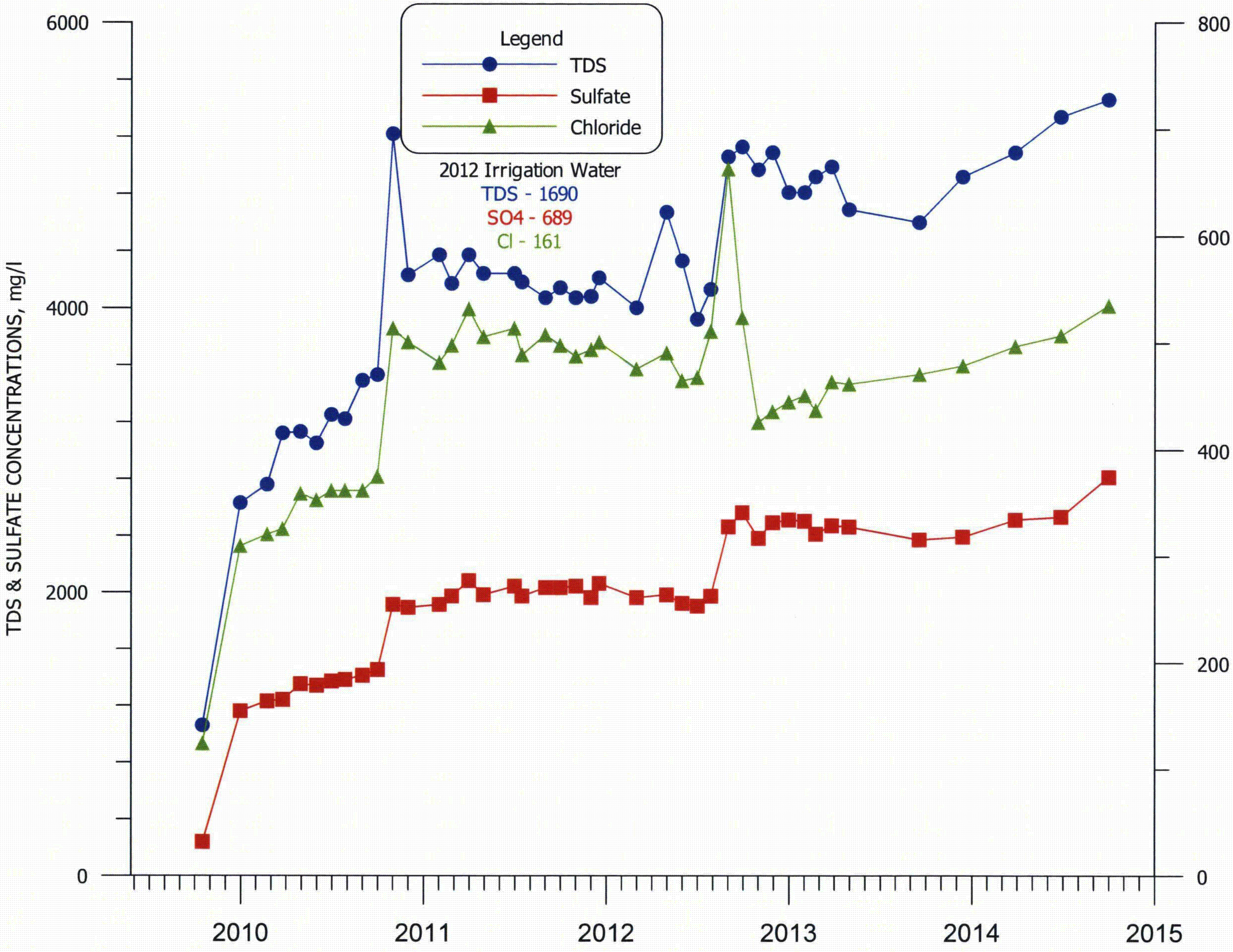

FIGURE A.3-1. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY34-1.

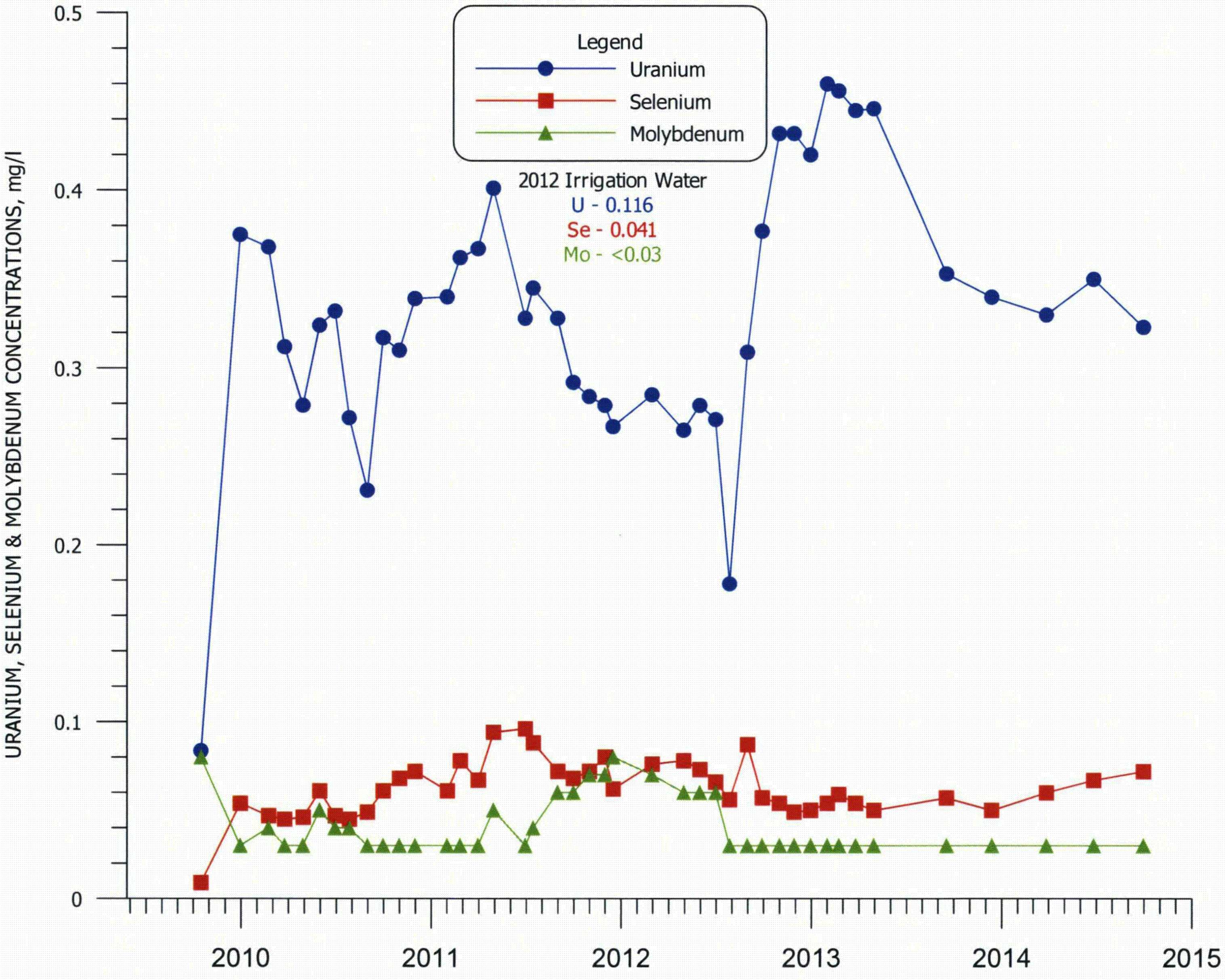

FIGURE A.3-2. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY34-1.

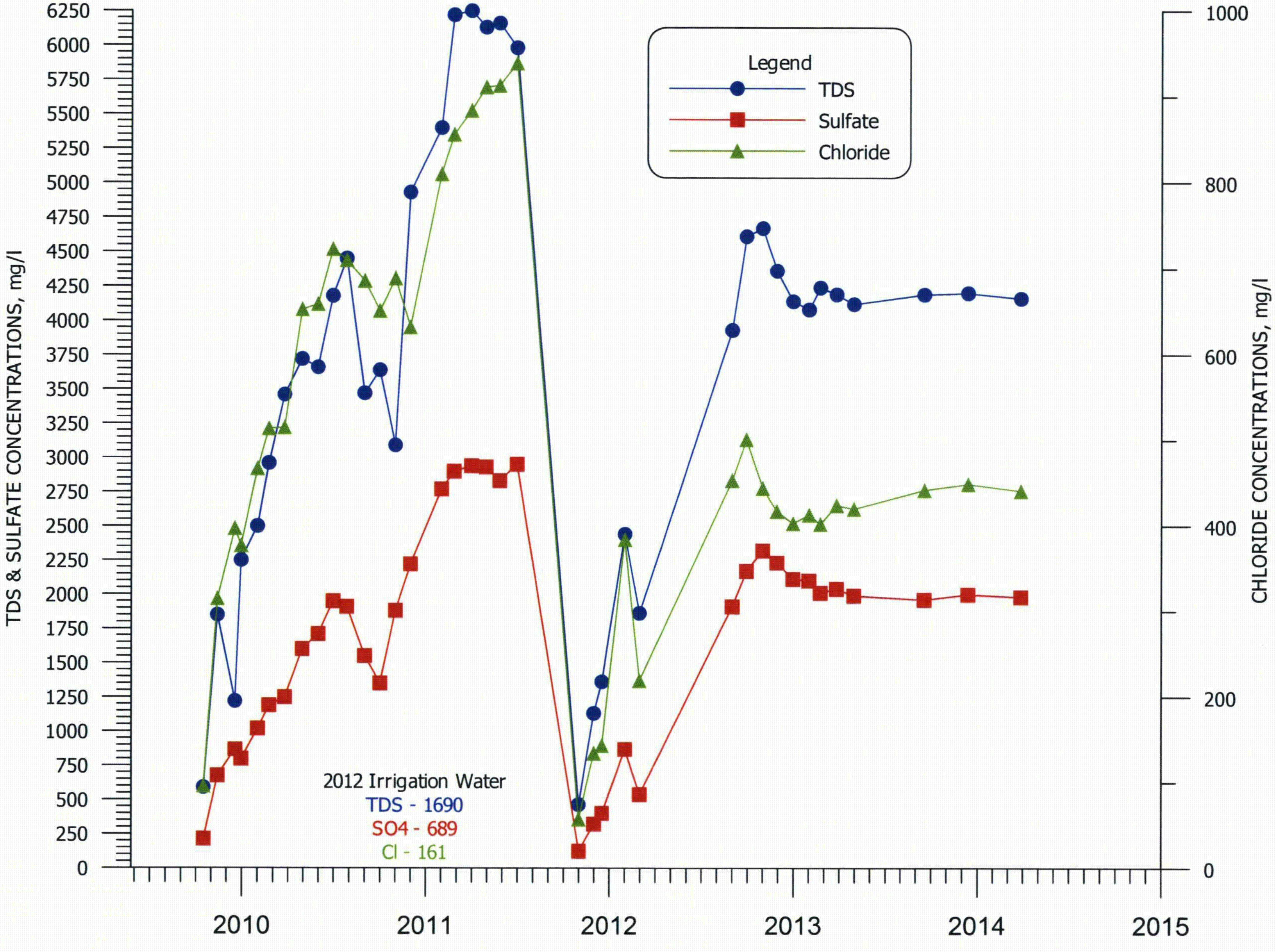

FIGURE A.3-3. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY34-2.

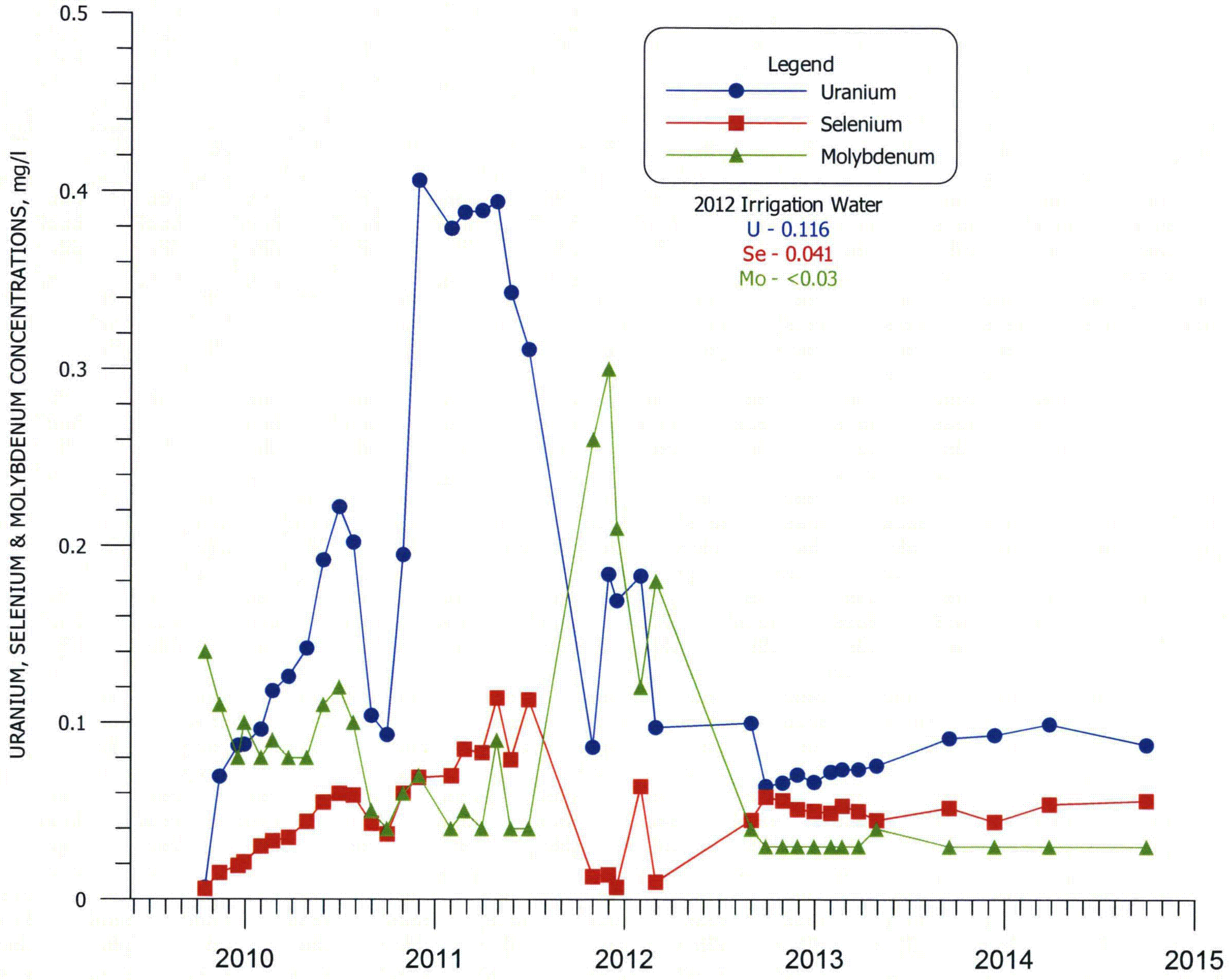

FIGURE A.3-4. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY34-2.

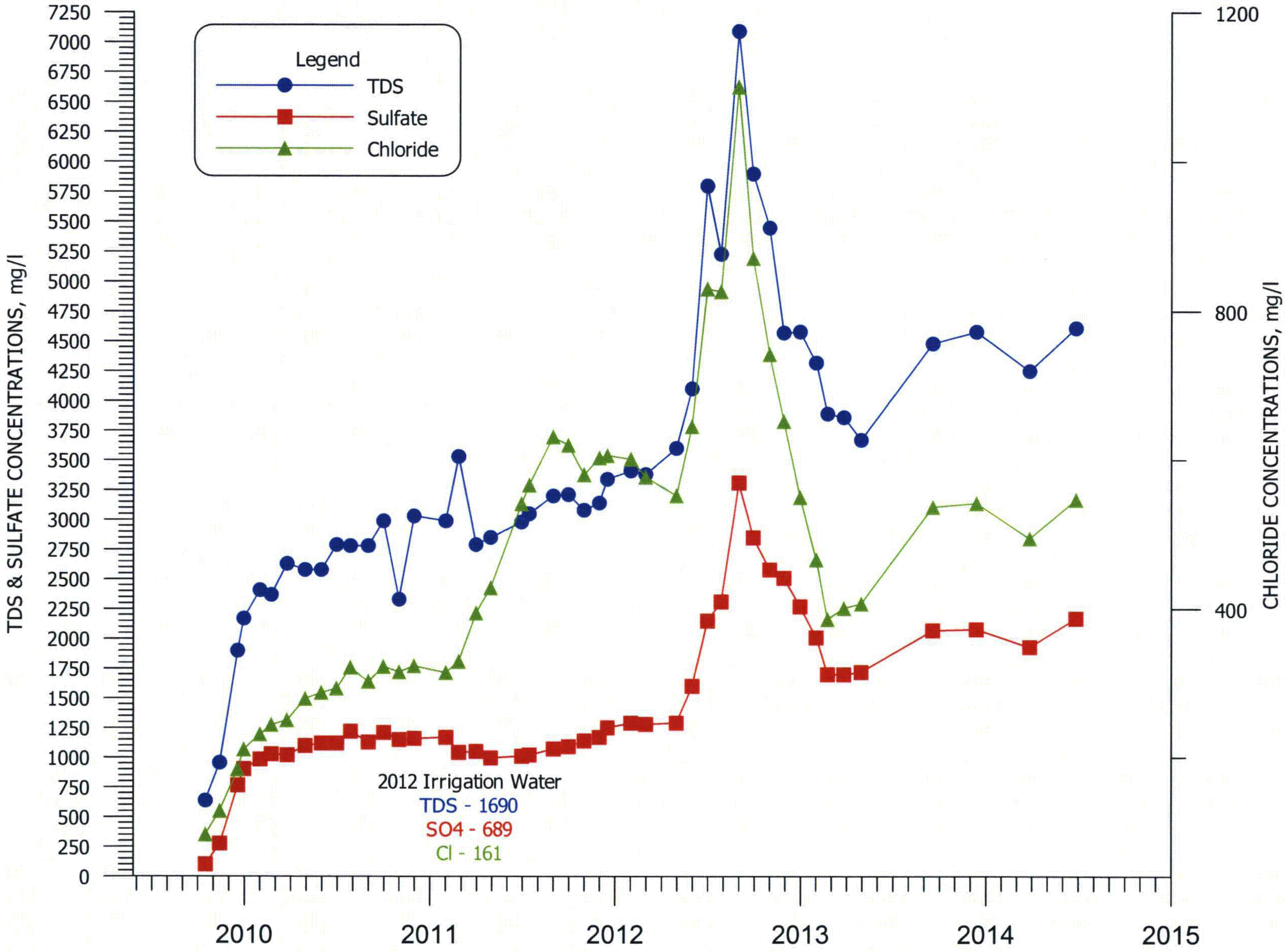

FIGURE A.3-5. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY34-3.

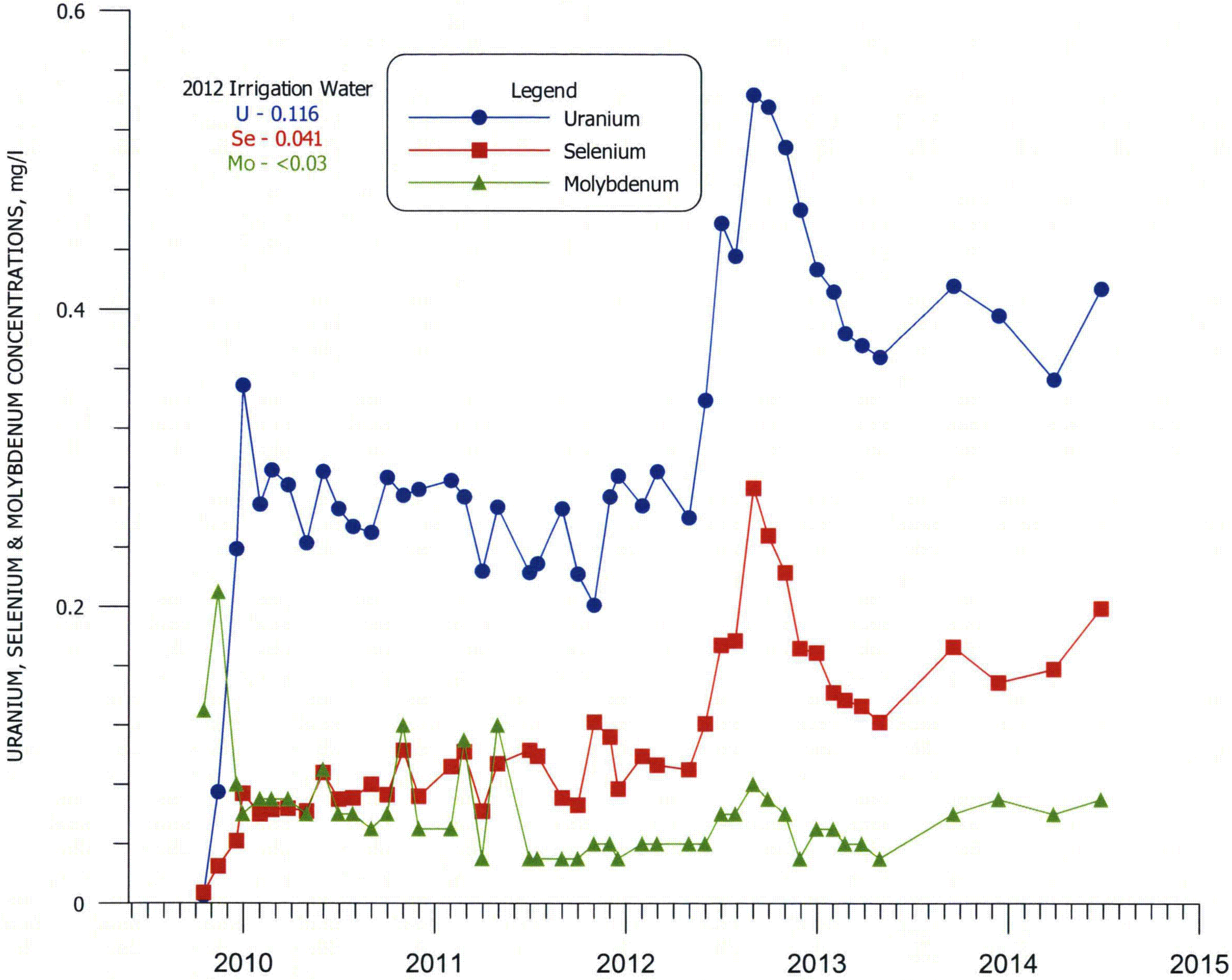

FIGURE A.3-6. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY34-3.

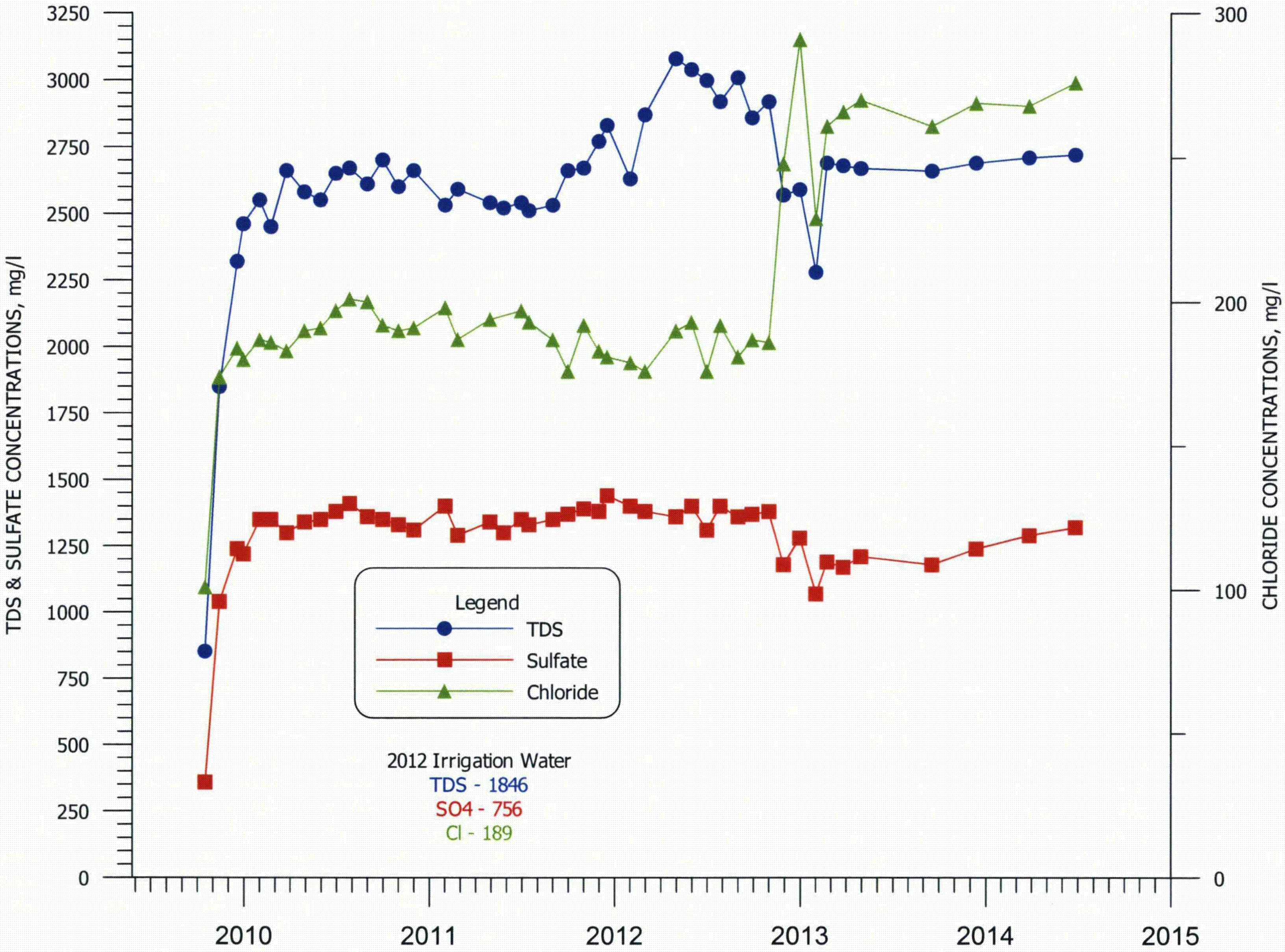

FIGURE A.3-7. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY28-1.

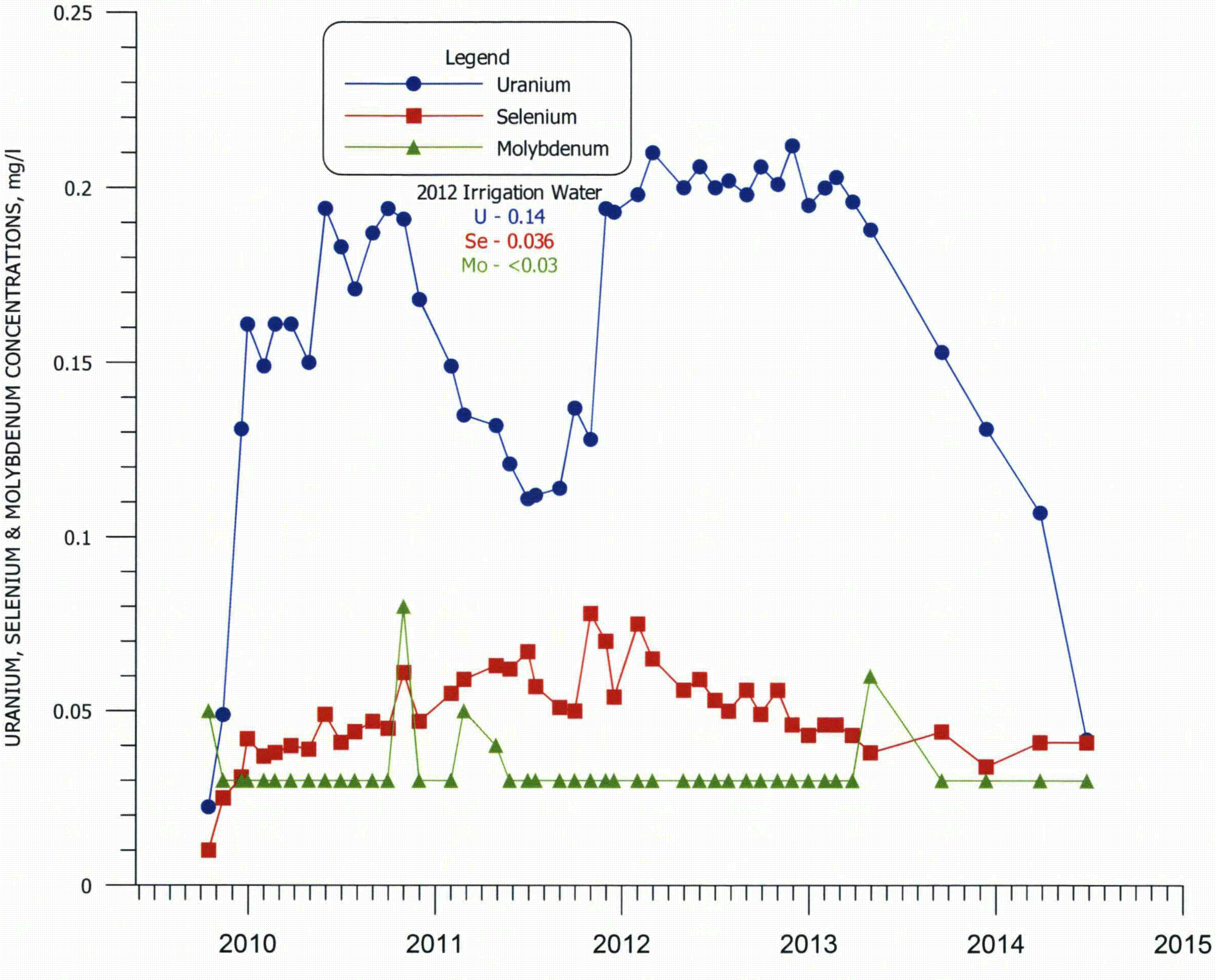

FIGURE A.3-8. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY28-1.

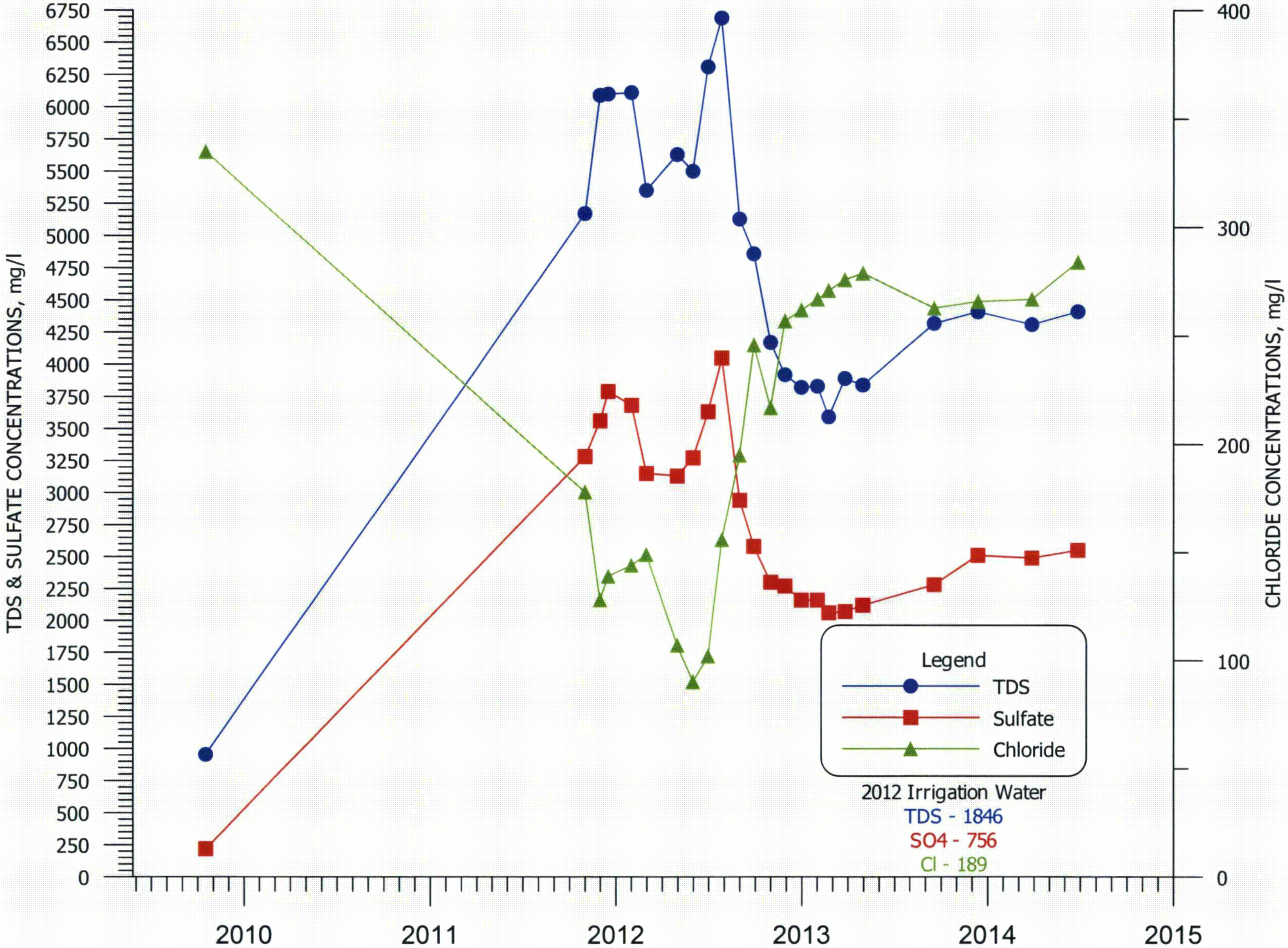

FIGURE A.3-9. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY28-2.

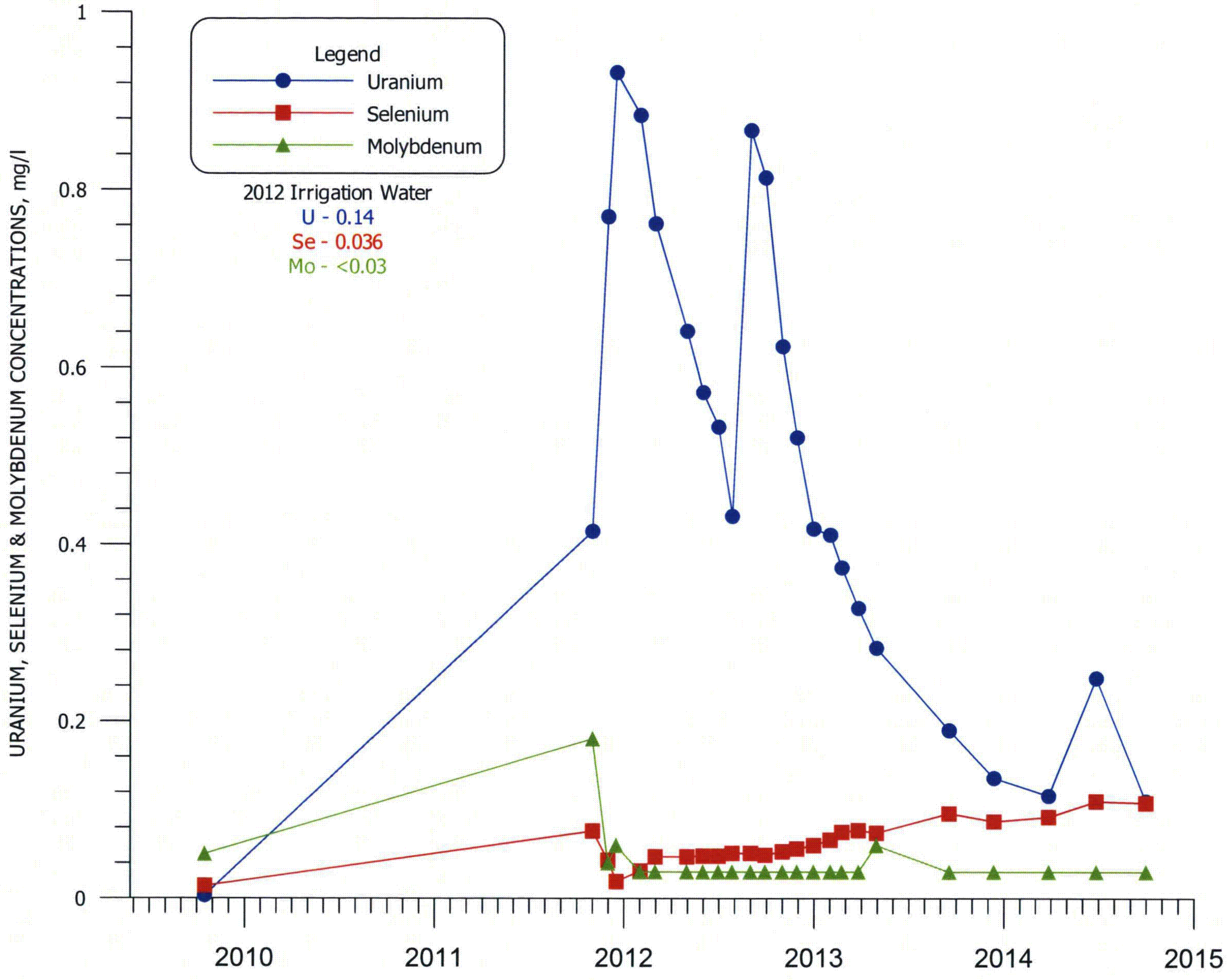

FIGURE A.3-10. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY28-2.

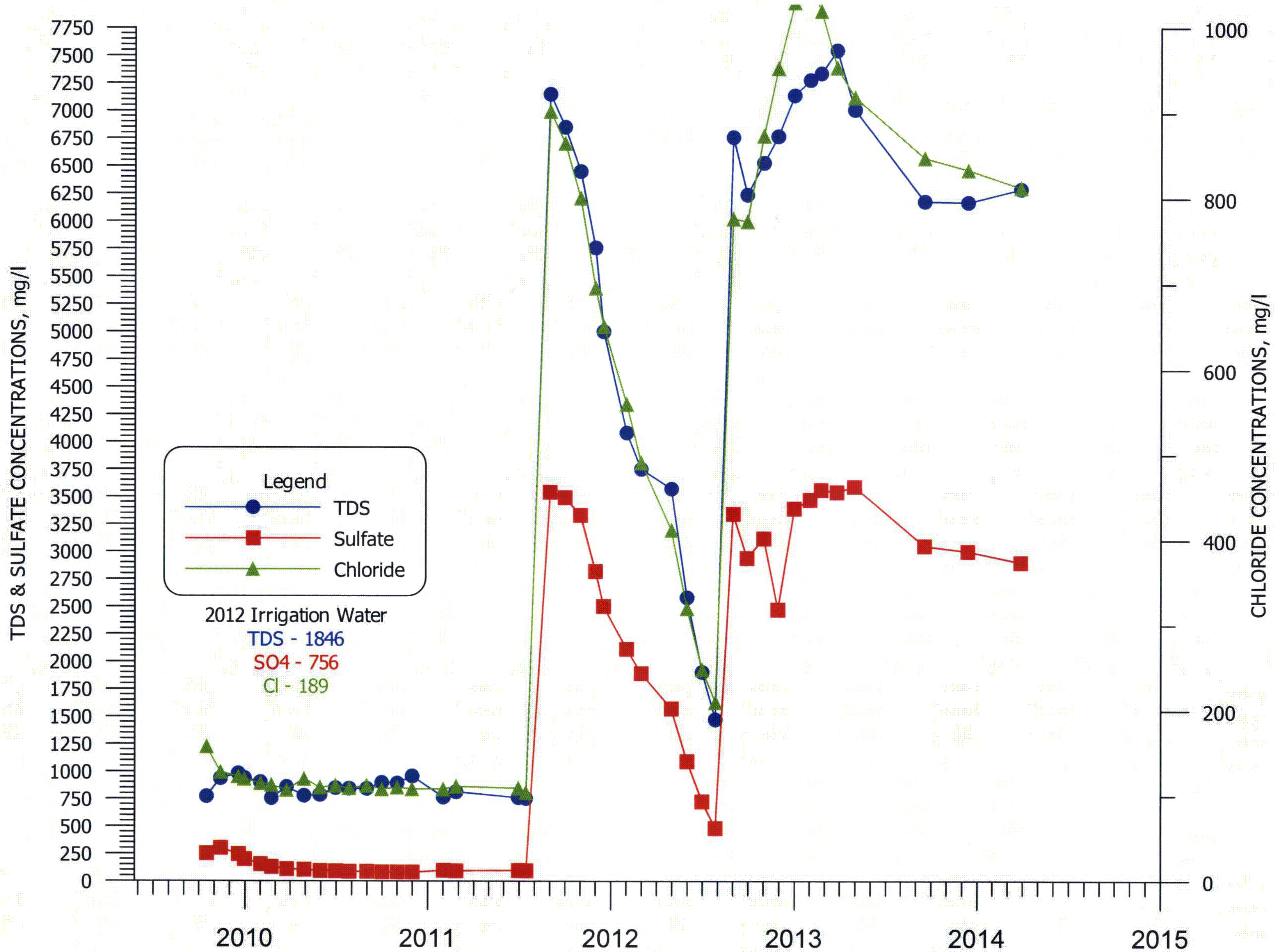

FIGURE A.3-11. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY28-2M

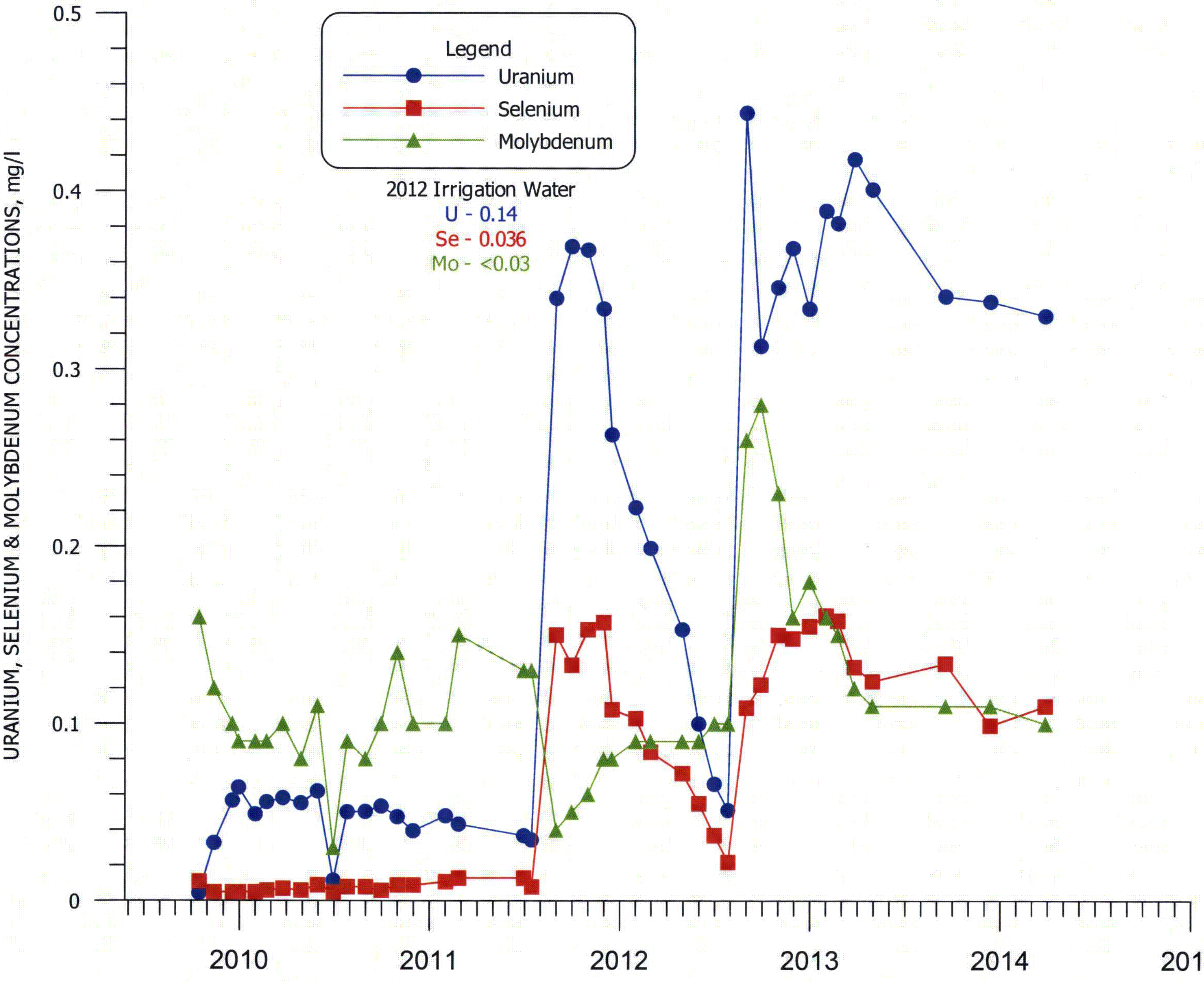

FIGURE A.3-12. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY28-2M.

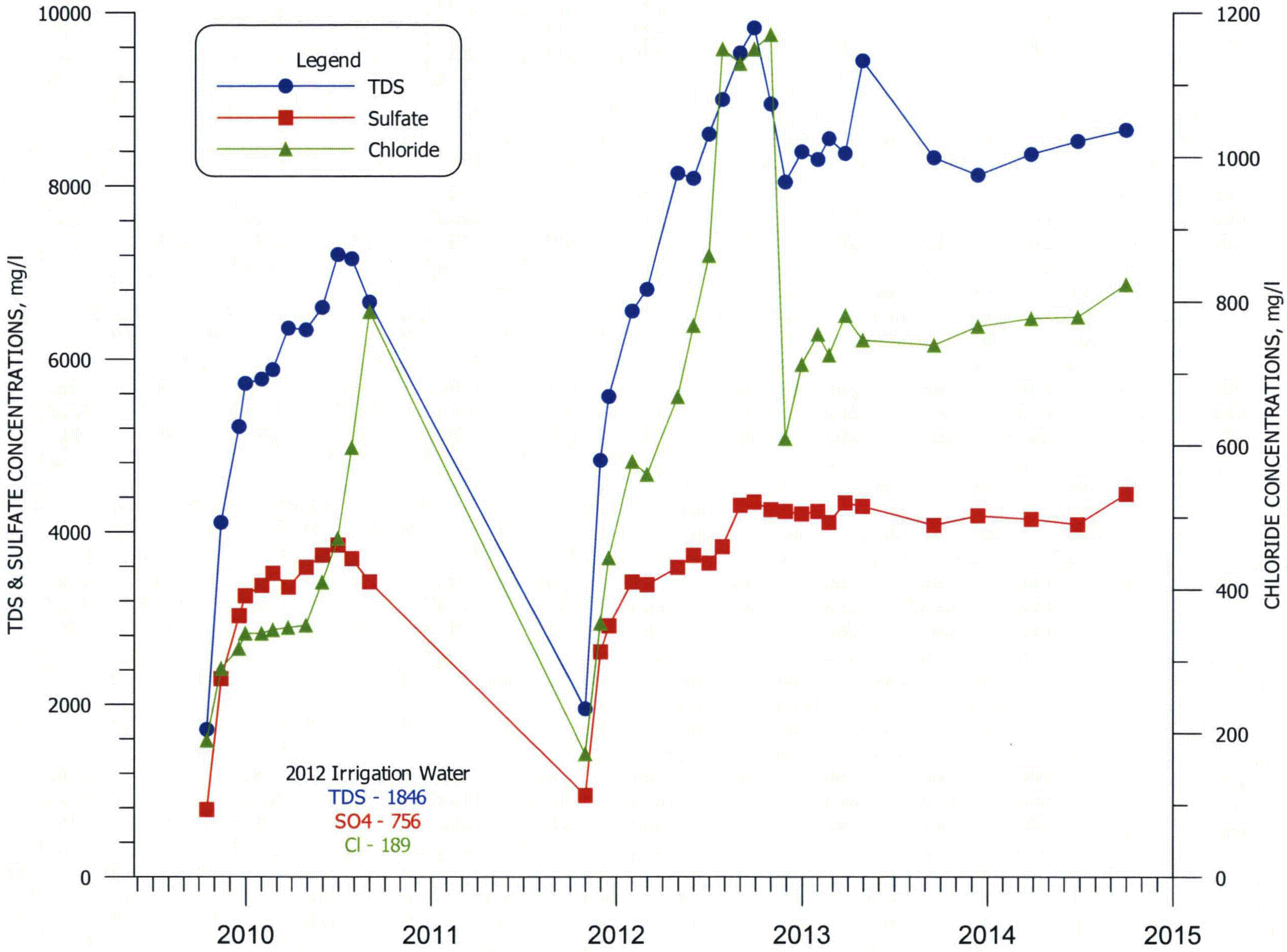

FIGURE A.3-13. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY28-3.

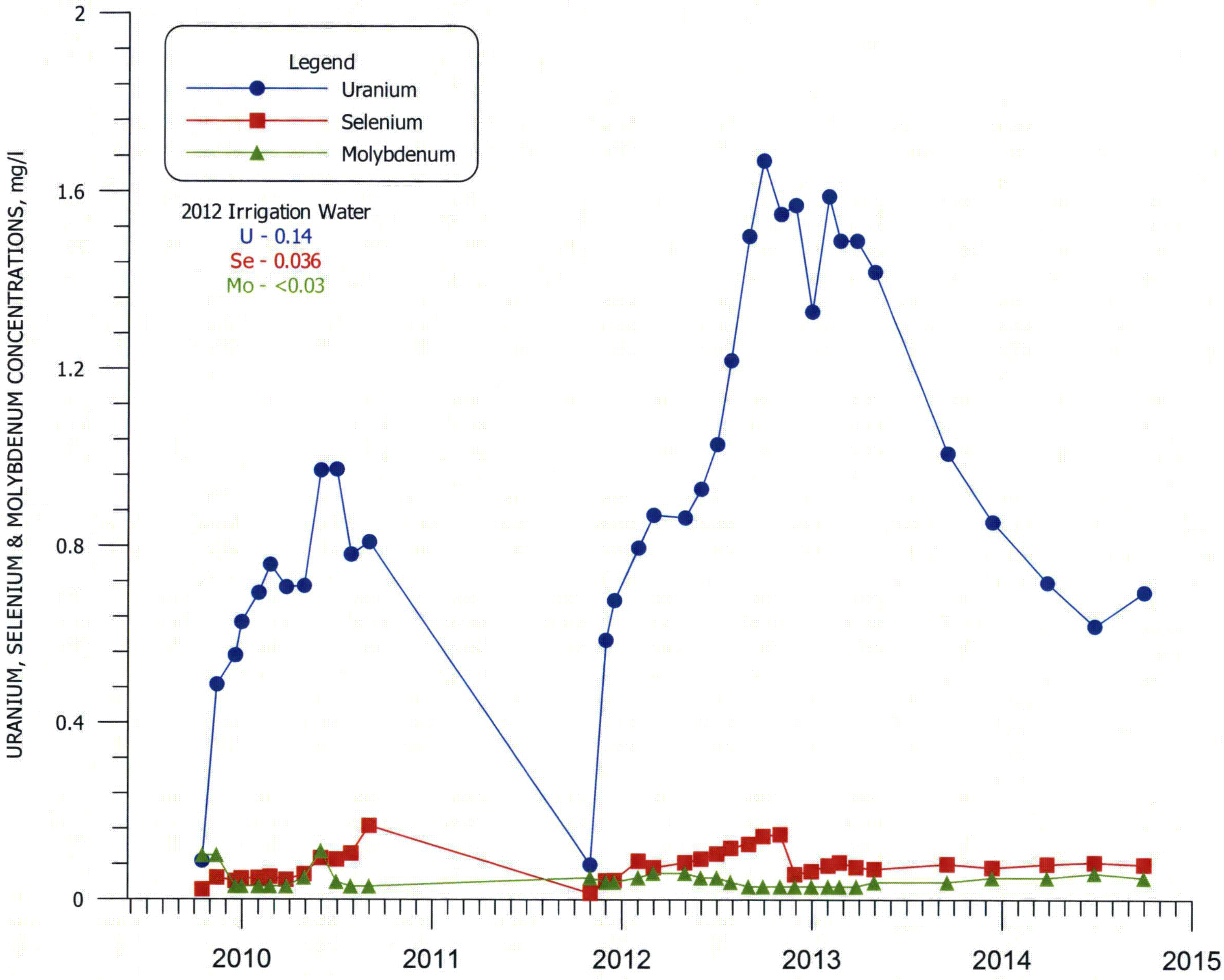

FIGURE A.3-14. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY28-3.

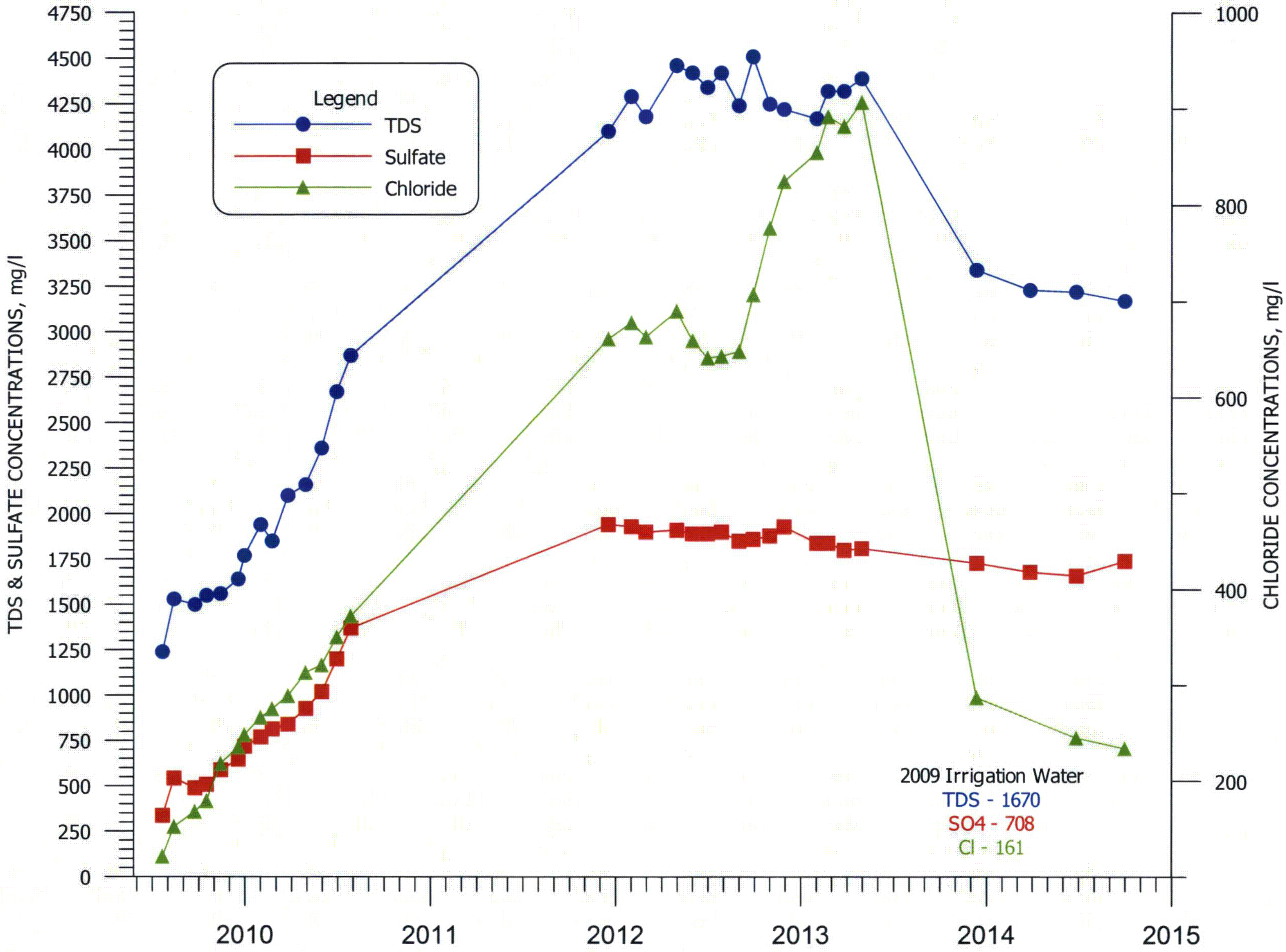

FIGURE A.3-15. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY1.

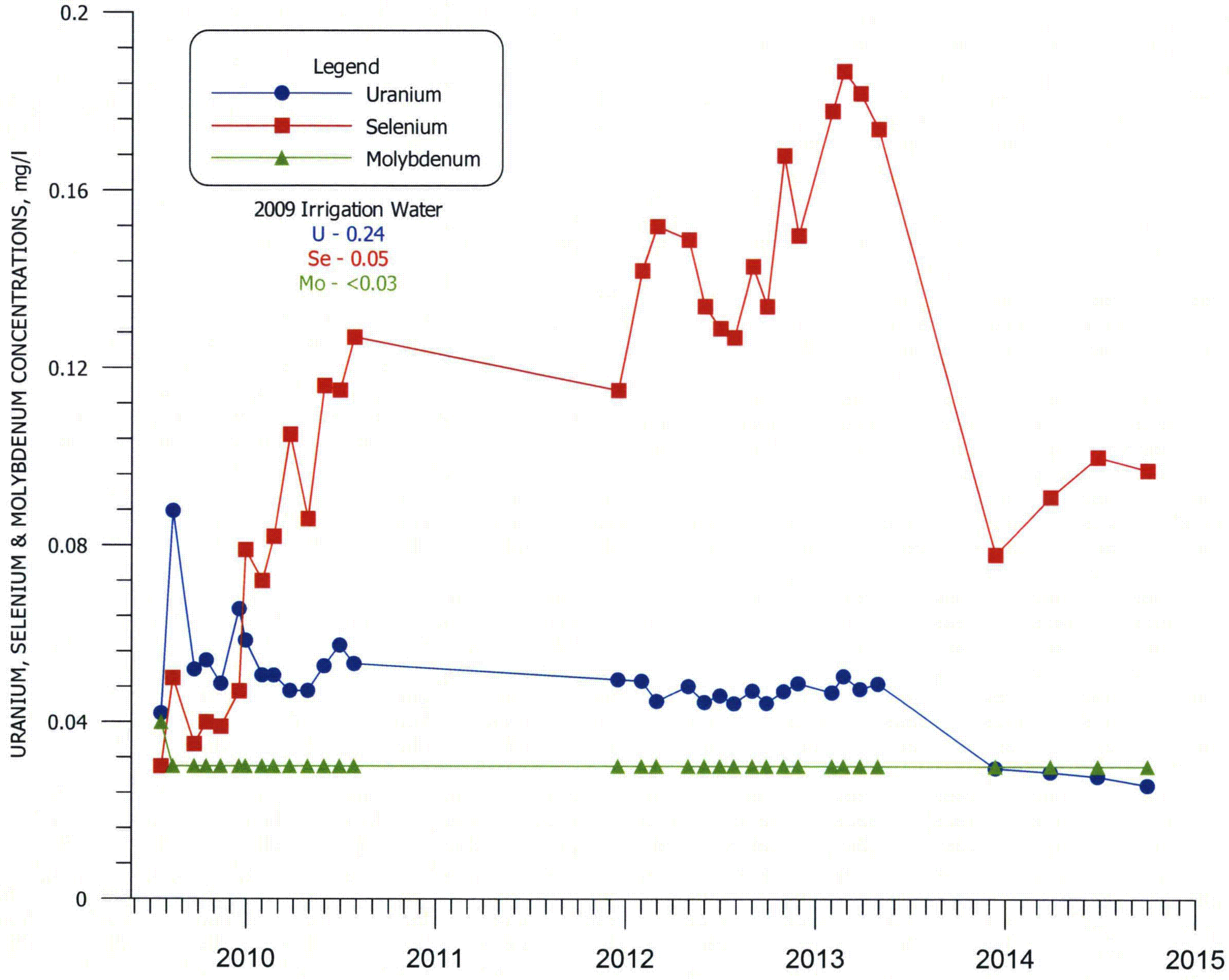

FIGURE A.3-16. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY1.

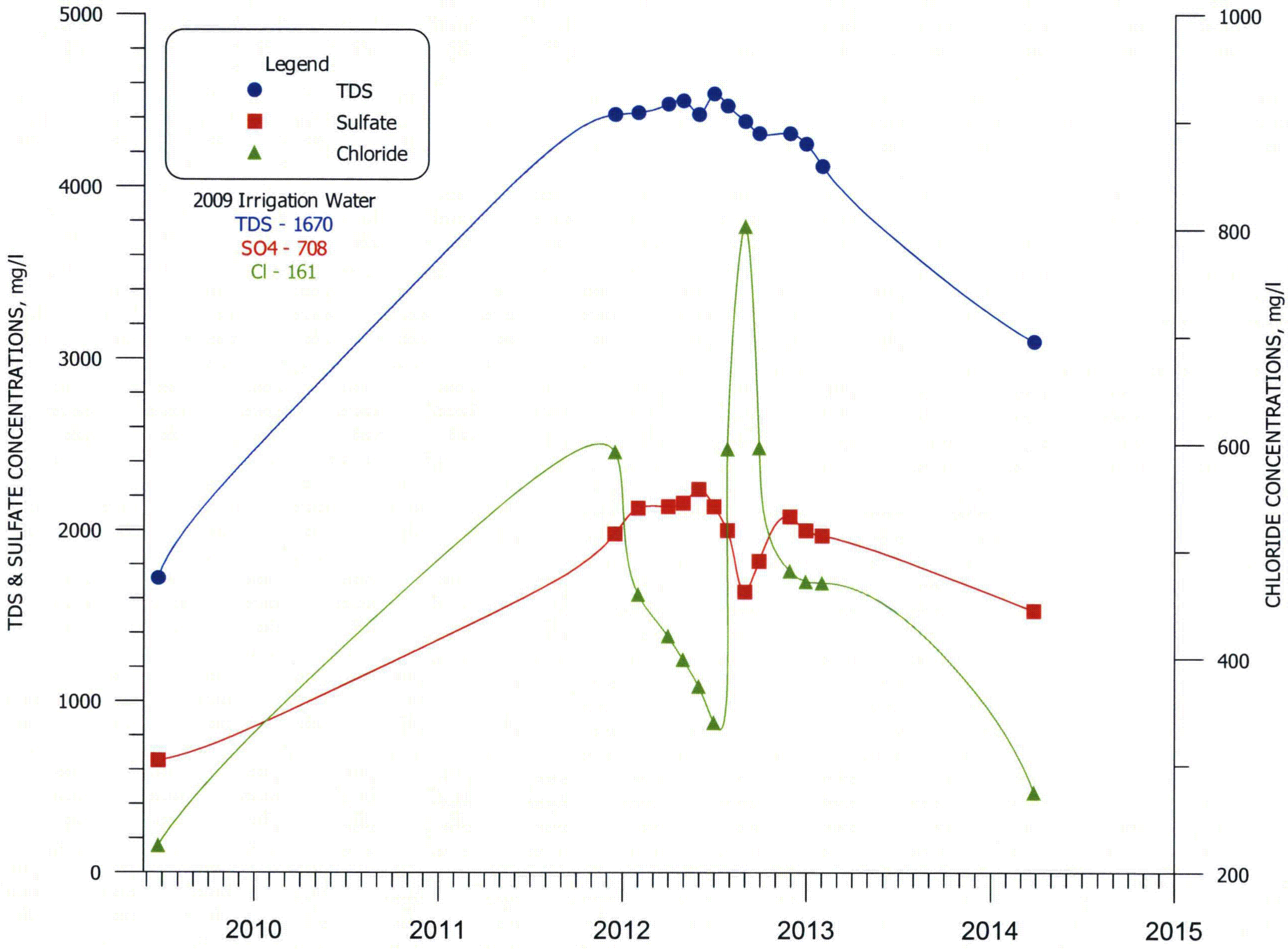

FIGURE A.3-17. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY2.

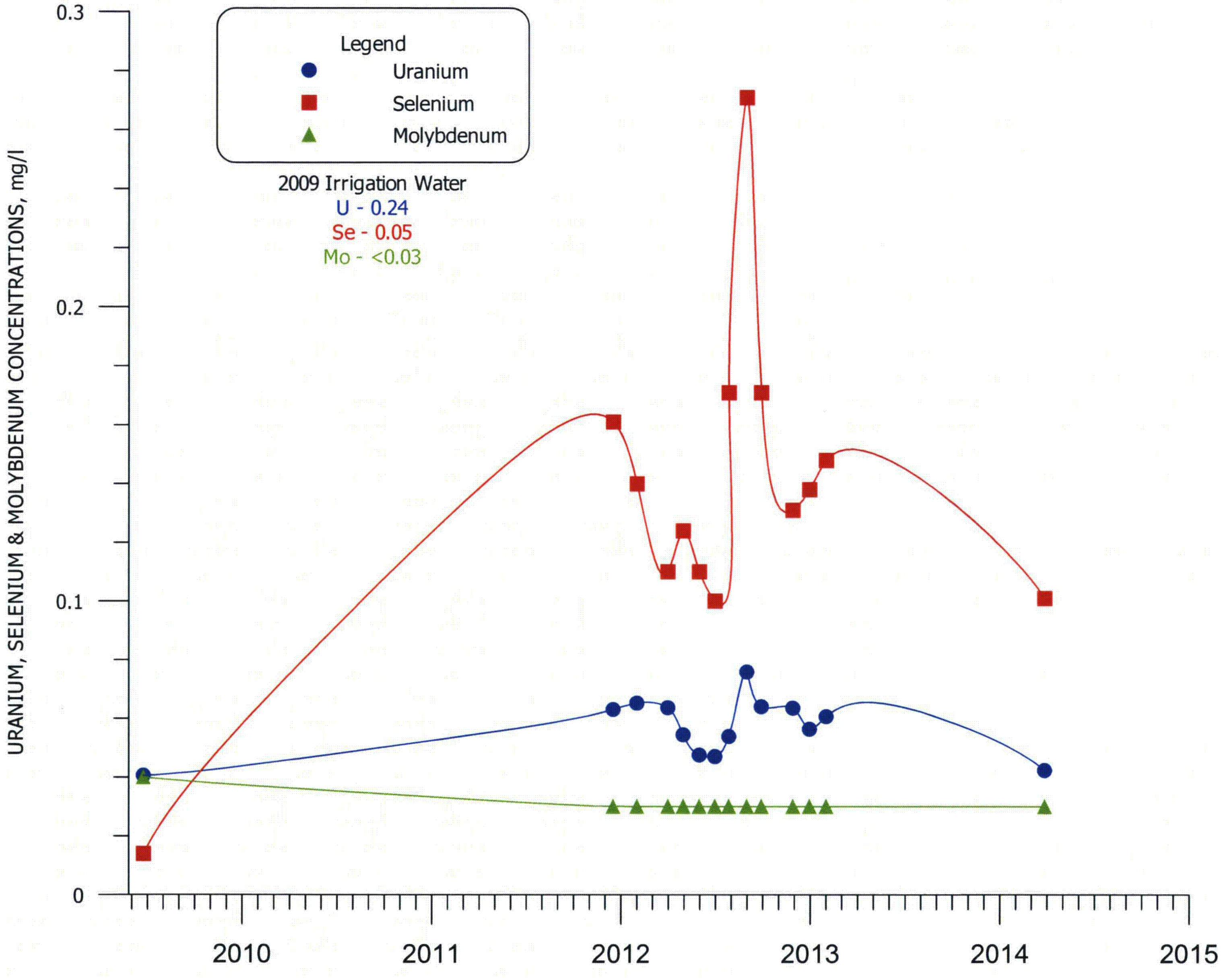

FIGURE A.3-18. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY2.

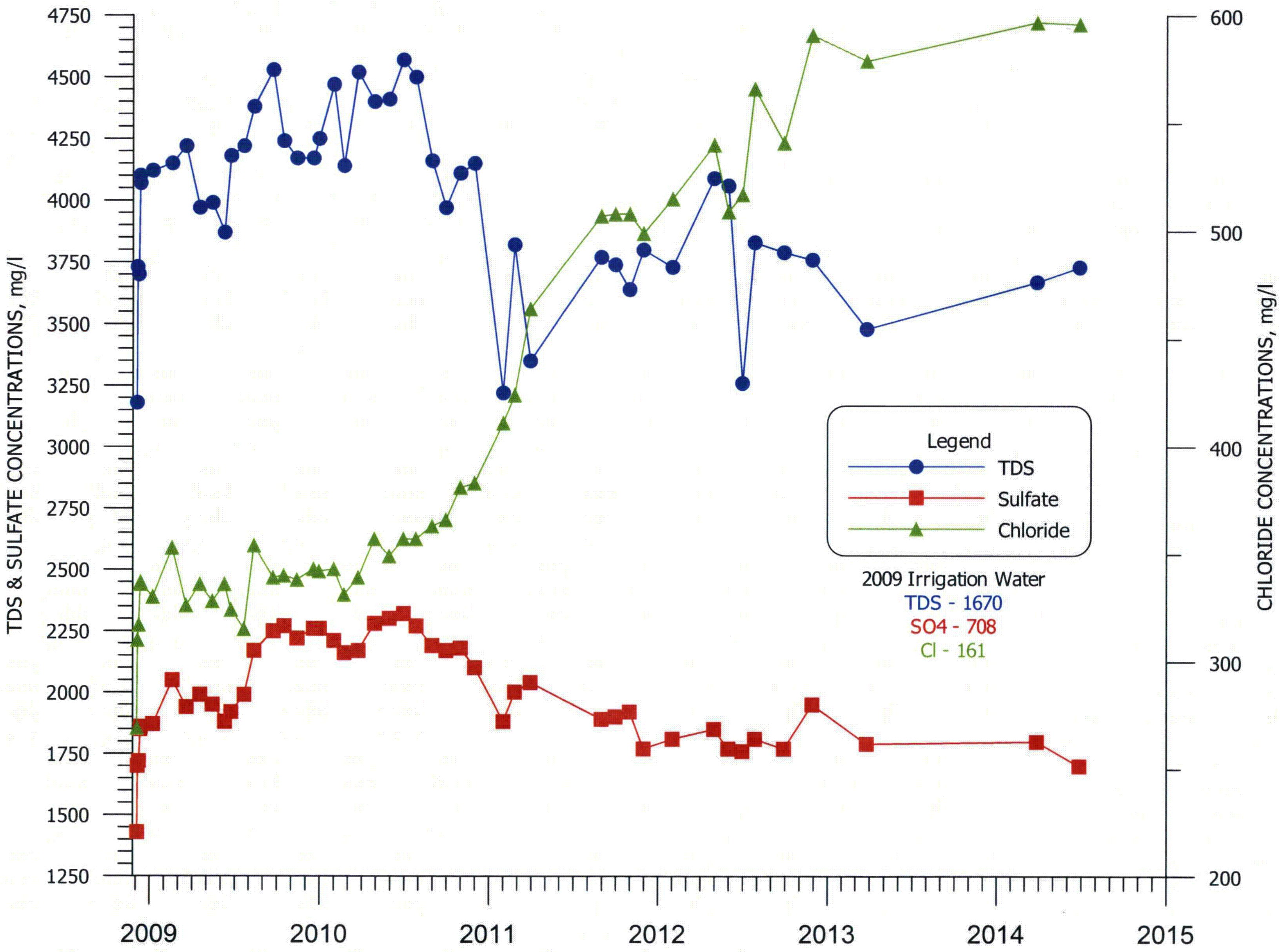

FIGURE A.3-19. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY4.

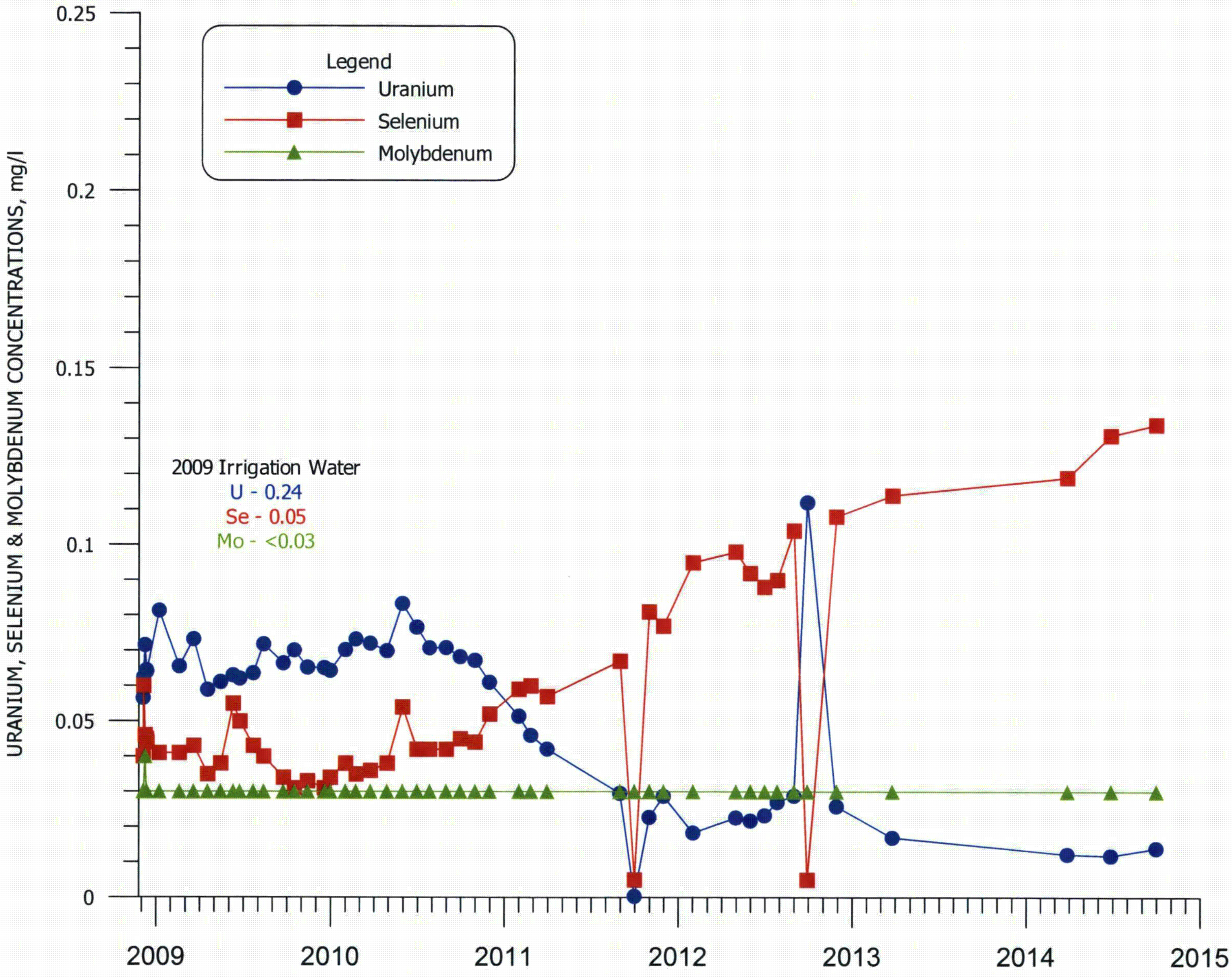

FIGURE A.3-20. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY4.

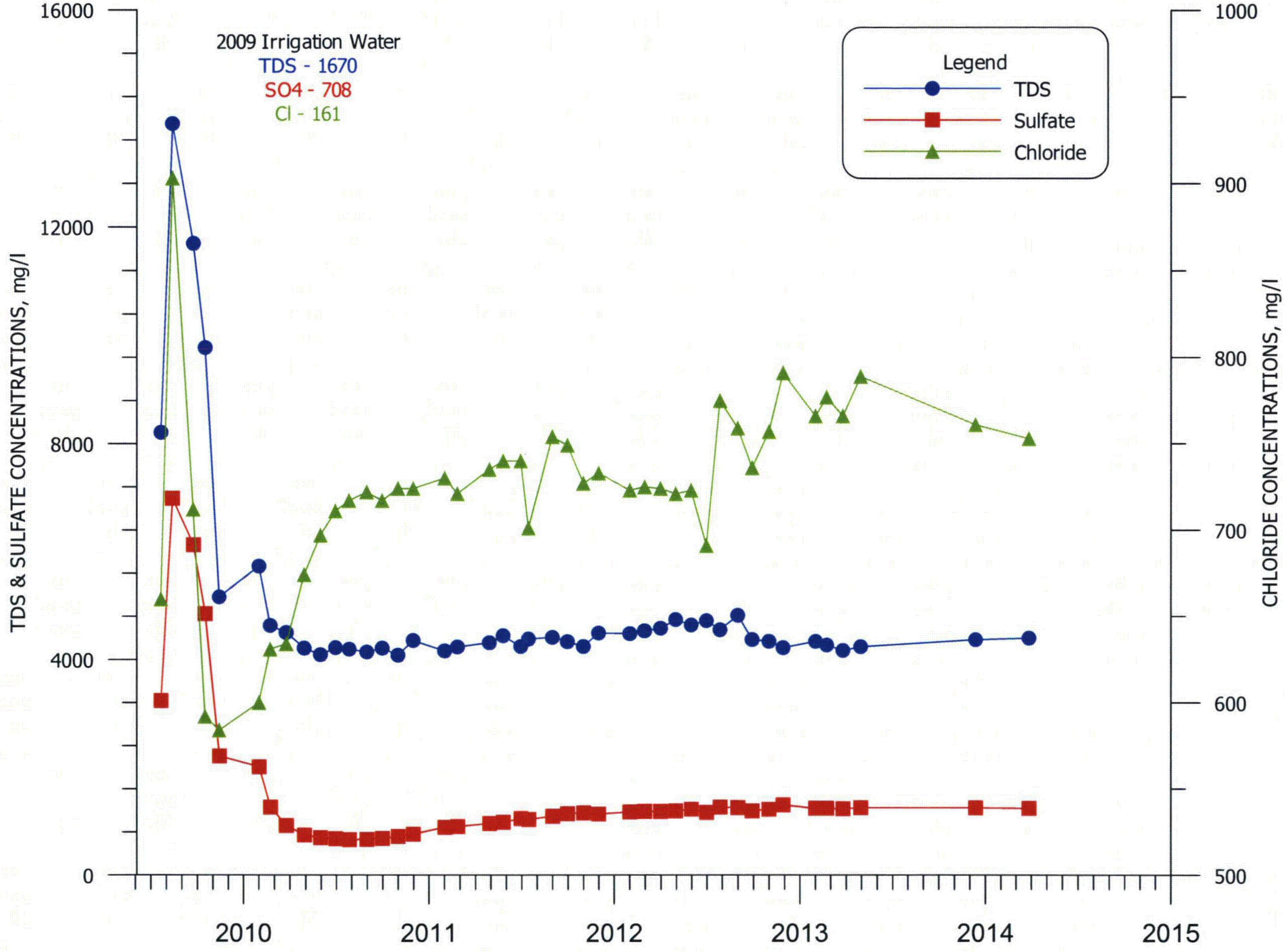

FIGURE A.3-21. TDS, SULFATE AND CHLORIDE CONCENTRATIONS FROM LY4MU.

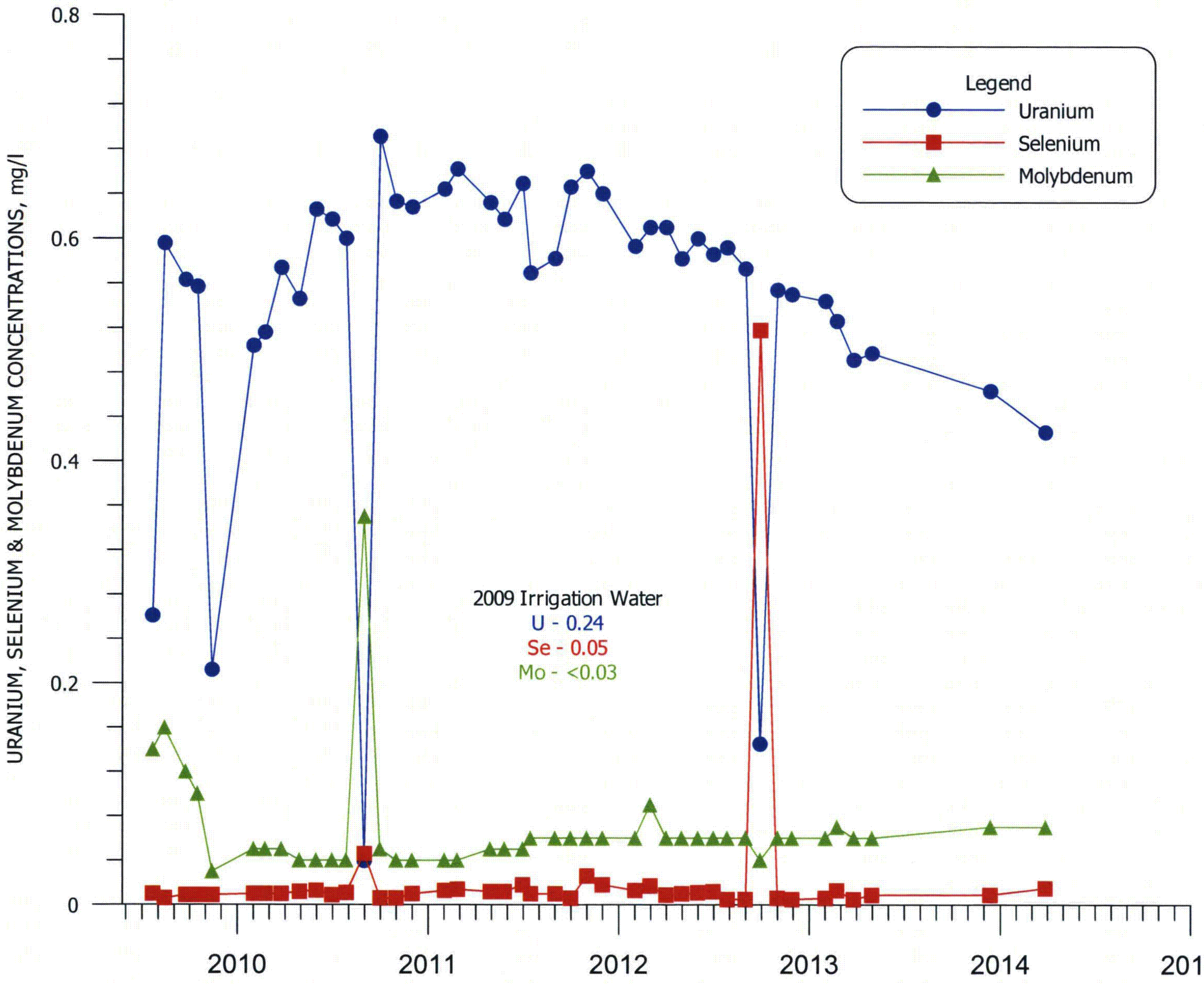

FIGURE A.3-22. URANIUM, SELENIUM AND MOLYBDENUM CONCENTRATIONS FROM LY4MU.

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY1	7/22/2009	ENER	---	---	---	---	---	---	121	337	1240	---	---
	8/13/2009	ENER	---	---	---	---	---	---	152	543	1530	---	---
	9/23/2009	ENER	201	118	2.90	61.3	529	< 1.000	168	489	1500	* 2010	0.951
	10/16/2009	ENER	---	---	---	---	---	---	179	508	1550	* 2082	---
	11/13/2009	ENER	189	154	2.80	61.5	488	< 5.00	218	590	1560	* 2270	0.934
	12/18/2009	ENER	230	141	2.60	60.1	467	< 5.00	235	647	1640	* 2338	0.922
	12/30/2009	ENER	286	127	2.40	61.2	430	< 5.00	248	719	1770	* 2075	0.940
	1/31/2010	ENER	---	---	---	---	---	---	266	770	1940	* 2490	---
	2/22/2010	ENER	---	---	---	---	---	---	275	814	1850	* 2560	---
	3/25/2010	ENER	---	---	---	---	---	---	289	840	2100	* 2650	---
	4/29/2010	ENER	---	---	---	---	---	---	313	927	2160	* 2750	---
	5/31/2010	ENER	---	---	---	---	---	---	321	1020	2360	* 2870	---
	6/30/2010	ENER	---	---	---	---	---	---	350	1200	2670	* 3136	---
	7/27/2010	ENER	---	---	---	---	---	---	372	1370	2870	* 3310	---
	12/16/2011	ENER	---	---	---	---	---	---	661	1940	4100	* 4640	---
	1/31/2012	ENER	---	---	---	---	---	---	678	1930	4290	* 5036	---
	2/29/2012	ENER	---	---	---	---	---	---	663	1900	4180	* 5012	---
	4/30/2012	ENER	---	---	---	---	---	---	690	1910	4460	* 5033	---
	5/31/2012	ENER	---	---	---	---	---	---	659	1890	4420	* 4993	---
	6/30/2012	ENER	---	---	---	---	---	---	641	1890	4340	* 4941	---
	7/27/2012	ENER	---	---	---	---	---	---	643	1900	4420	* 4910	---
	8/31/2012	ENER	---	---	---	---	---	---	648	1850	4240	* 4944	---
	9/28/2012	ENER	---	---	---	---	---	---	707	1860	4510	* 5017	---
	10/31/2012	ENER	---	---	---	---	---	---	776	1880	4250	* 5082	---
	11/28/2012	ENER	---	---	---	---	---	---	825	1930	4220	* 5174	---
	1/31/2013	ENER	---	---	---	---	---	---	855	1840	4170	* 5245	---
	2/22/2013	ENER	---	---	---	---	---	---	892	1840	4320	* 5239	---
	3/26/2013	HMC	---	---	---	---	---	---	882	1800	4320	5292	---
	4/30/2013	ENER	---	---	---	---	---	---	907	1810	4390	* 5297	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY1	12/12/2013	ENER	---	---	---	---	---	---	287	1730	3340	* 3810	---
	3/28/2014	ENER	---	---	---	---	---	---	---	1680	3230	* 2788	---
	6/27/2014	ENER	---	---	---	---	---	---	245	1660	3220	* 3675	---
	9/30/2014	ENER	---	---	---	---	---	---	234	1740	3170	* 3632	---
LY2	6/24/2009	ENER	---	---	---	---	---	---	225	654	1720	* 2308	---
	12/16/2011	ENER	---	---	---	---	---	---	593	1980	4420	* 5068	---
	1/31/2012	ENER	---	---	---	---	---	---	460	2130	4430	* 5013	---
	3/31/2012	ENER	---	---	---	---	---	---	421	2140	4480	* 4920	---
	4/30/2012	ENER	---	---	---	---	---	---	399	2160	4500	* 4988	---
	5/31/2012	ENER	---	---	---	---	---	---	374	2240	4420	* 4871	---
	6/30/2012	ENER	---	---	---	---	---	---	340	2140	4540	* 4844	---
	7/27/2012	ENER	---	---	---	---	---	---	596	2000	4470	* 5090	---
	8/31/2012	ENER	---	---	---	---	---	---	803	1640	4380	* 5351	---
	9/28/2012	ENER	---	---	---	---	---	---	597	1820	4310	* 4984	---
	11/28/2012	ENER	---	---	---	---	---	---	482	2080	4310	* 4831	---
	12/30/2012	ENER	---	---	---	---	---	---	472	2000	4250	* 4892	---
	1/31/2013	ENER	---	---	---	---	---	---	471	1970	4120	* 4777	---
	3/28/2014	ENER	---	---	---	---	---	---	275	1530	3100	* 2710	---
LY4	12/4/2008	ENER	---	---	---	---	---	---	269	1430	3180	---	---
	12/5/2008	ENER	---	---	---	---	---	---	310	1700	3730	---	---
	12/8/2008	ENER	---	---	---	---	---	---	317	1720	3700	---	---
	12/11/2008	ENER	---	---	---	---	---	---	336	1850	4100	---	---
	12/12/2008	ENER	---	---	---	---	---	---	337	1860	4070	---	---
	1/7/2009	ENER	---	---	---	---	---	---	330	1870	4120	---	---
	2/18/2009	ENER	702	138	5.20	412	783	< 1.000	353	2050	4150	---	0.984
	3/20/2009	ENER	---	---	---	---	---	---	326	1940	4220	---	---
	4/18/2009	ENER	---	---	---	---	---	---	336	1990	3970	* 4522	---
	5/15/2009	ENER	---	---	---	---	---	---	328	1950	3990	---	---
	6/10/2009	ENER	---	---	---	---	---	---	336	1880	3870	* 4370	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY4	6/24/2009	ENER	---	---	---	---	---	---	324	1920	4180	* 4503	---
	7/22/2009	ENER	---	---	---	---	---	---	315	1990	4220	---	---
	8/13/2009	ENER	---	---	---	---	---	---	354	2170	4380	---	---
	9/23/2009	ENER	728	142	3.50	392	842	< 1.000	339	2250	4530	* 4870	0.928
	10/16/2009	ENER	---	---	---	---	---	---	340	2270	4240	* 5040	---
	11/13/2009	ENER	652	147	3.80	430	634	< 5.00	338	2220	4170	* 5100	0.957
	12/18/2009	ENER	757	149	4.00	425	712	< 5.00	343	2260	4170	* 5096	1.00
	12/30/2009	ENER	699	153	4.00	468	837	< 5.00	342	2260	4250	* 3091	0.962
	1/31/2010	ENER	---	---	---	---	---	---	343	2210	4470	* 5030	---
	2/22/2010	ENER	---	---	---	---	---	---	331	2160	4140	* 5020	---
	3/25/2010	ENER	---	---	---	---	---	---	339	2170	4520	* 5020	---
	4/29/2010	ENER	---	---	---	---	---	---	357	2280	4400	* 5040	---
	5/31/2010	ENER	---	---	---	---	---	---	349	2300	4410	* 5100	---
	6/30/2010	ENER	---	---	---	---	---	---	357	2320	4570	* 5100	---
	7/27/2010	ENER	---	---	---	---	---	---	357	2270	4500	* 4900	---
	8/31/2010	ENER	---	---	---	---	---	---	363	2190	4160	* 4900	---
	9/30/2010	ENER	---	---	---	---	---	---	366	2170	3970	* 4850	---
	10/31/2010	ENER	---	---	---	---	---	---	381	2180	4110	* 4670	---
	11/30/2010	ENER	---	---	---	---	---	---	383	2100	4150	* 4660	---
	1/31/2011	ENER	---	---	---	---	---	---	411	1880	3220	* 4510	---
	2/25/2011	ENER	---	---	---	---	---	---	424	2000	3820	* 4490	---
	3/31/2011	ENER	---	---	---	---	---	---	464	2040	3350	---	---
	5/26/2011	HMC	---	---	---	---	---	---	---	---	---	4490	---
	8/31/2011	ENER	---	---	---	---	---	---	507	1890	3770	* 4515	---
	9/30/2011	ENER	---	---	---	---	---	---	508	1900	3740	---	---
	10/31/2011	ENER	---	---	---	---	---	---	508	1920	3640	---	---
	11/30/2011	ENER	---	---	---	---	---	---	499	1770	3800	---	---
	1/31/2012	ENER	---	---	---	---	---	---	515	1810	3730	---	---
	4/30/2012	ENER	---	---	---	---	---	---	540	1850	4090	---	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY4	5/31/2012	ENER	---	---	---	---	---	---	509	1770	4060	---	---
	6/30/2012	ENER	---	---	---	---	---	---	517	1760	3260	---	---
	7/27/2012	ENER	---	---	---	---	---	---	566	1810	3830	---	---
	9/28/2012	ENER	---	---	---	---	---	---	541	1770	3790	---	---
	11/28/2012	ENER	---	---	---	---	---	---	591	1950	3760	---	---
	12/30/2012	HMC	---	---	---	---	---	---	---	---	---	4513	---
	3/26/2013	HMC	---	---	---	---	---	---	579	1790	3480	---	---
	3/28/2014	ENER	---	---	---	---	---	---	597	1800	3670	---	---
	6/27/2014	ENER	---	---	---	---	---	---	596	1700	3730	* 4446	---
LY4ML	4/18/2009	ENER	---	---	---	---	---	---	142	409	---	---	---
	6/24/2009	ENER	---	---	---	---	---	---	684	5510	12000	---	---
	7/22/2009	ENER	---	---	---	---	---	---	650	5460	11600	---	---
	8/13/2009	ENER	---	---	---	---	---	---	663	5050	10400	---	---
	9/23/2009	ENER	180	29.6	6.00	2180	1140	< 1.000	629	3460	7340	* 9310	0.981
	10/16/2009	ENER	---	---	---	---	---	---	568	2570	5840	* 7904	---
	11/13/2009	ENER	166	98.2	11.0	2820	1570	72.0	591	3930	7830	* 7250	1.10
	12/18/2009	ENER	113	25.5	5.00	1520	1190	< 5.00	562	1760	4520	* 6490	1.03
	4/29/2010	ENER	---	---	---	---	---	---	571	1070	3700	* 5330	---
	5/31/2010	ENER	---	---	---	---	---	---	567	917	3080	---	---
	6/30/2010	ENER	---	---	---	---	---	---	581	907	3130	---	---
	7/27/2010	ENER	---	---	---	---	---	---	574	866	3190	* 4860	---
	8/31/2010	ENER	---	---	---	---	---	---	588	851	3080	* 4820	---
	9/30/2010	ENER	---	---	---	---	---	---	580	805	2980	* 4760	---
	10/31/2010	ENER	---	---	---	---	---	---	575	777	2970	* 4660	---
	11/30/2010	ENER	---	---	---	---	---	---	566	751	3180	* 4670	---
	4/29/2011	ENER	---	---	---	---	---	---	597	763	2520	---	---
	10/31/2011	ENER	---	---	---	---	---	---	727	1150	4240	---	---
LY4MU	7/22/2009	ENER	---	---	---	---	---	---	660	3240	8210	---	---
	8/13/2009	ENER	---	---	---	---	---	---	903	6990	13900	---	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY4MU	9/23/2009	ENER	263	90.0	14.0	3510	1580	< 1.000	712	6130	11700	* 13860	1.000
	10/16/2009	ENER	---	---	---	---	---	---	592	4850	9780	* 12060	---
	11/13/2009	ENER	100.0	31.7	5.00	1790	1030	< 5.00	584	2210	5160	* 10600	1.08
	1/31/2010	ENER	---	---	---	---	---	---	600	2010	5730	* 7950	---
	2/22/2010	ENER	---	---	---	---	---	---	631	1260	4630	* 6740	---
	3/25/2010	ENER	---	---	---	---	---	---	634	920	4500	* 6390	---
	4/29/2010	ENER	---	---	---	---	---	---	674	742	4210	* 6200	---
	5/31/2010	ENER	---	---	---	---	---	---	697	694	4090	* 6160	---
	6/30/2010	ENER	---	---	---	---	---	---	711	675	4220	* 6150	---
	7/27/2010	ENER	---	---	---	---	---	---	717	657	4190	* 6050	---
	8/31/2010	ENER	---	---	---	---	---	---	722	662	4140	* 6140	---
	9/30/2010	ENER	---	---	---	---	---	---	717	679	4210	* 6190	---
	10/31/2010	ENER	---	---	---	---	---	---	724	718	4080	* 6170	---
	11/30/2010	ENER	---	---	---	---	---	---	724	760	4350	* 6280	---
	1/31/2011	ENER	---	---	---	---	---	---	730	885	4160	* 6300	---
	2/25/2011	ENER	---	---	---	---	---	---	721	898	4230	* 6340	---
	4/29/2011	ENER	---	---	---	---	---	---	735	955	4310	* 6400	---
	5/26/2011	ENER	---	---	---	---	---	---	740	976	4440	* 6410	---
	6/30/2011	ENER	---	---	---	---	---	---	740	1050	4240	* 6460	---
	7/15/2011	ENER	---	---	---	---	---	---	701	1030	4380	* 6460	---
	8/31/2011	ENER	---	---	---	---	---	---	754	1090	4410	* 6582	---
	9/30/2011	ENER	---	---	---	---	---	---	749	1140	4330	* 6500	---
	10/31/2011	ENER	---	---	---	---	---	---	727	1150	4240	* 6600	---
	11/30/2011	ENER	---	---	---	---	---	---	733	1130	4490	* 6596	---
	1/31/2012	ENER	---	---	---	---	---	---	723	1170	4480	* 6667	---
	2/29/2012	ENER	---	---	---	---	---	---	725	1180	4530	* 6600	---
	3/31/2012	ENER	---	---	---	---	---	---	724	1180	4580	* 6585	---
	4/30/2012	ENER	---	---	---	---	---	---	721	1190	4740	* 6600	---
	5/31/2012	ENER	---	---	---	---	---	---	723	1220	4640	* 6589	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY4MU	6/30/2012	ENER	---	---	---	---	---	---	691	1160	4720	---	---
	7/27/2012	ENER	---	---	---	---	---	---	775	1260	4550	* 6568	---
	8/31/2012	ENER	---	---	---	---	---	---	759	1250	4820	* 6554	---
	9/28/2012	ENER	---	---	---	---	---	---	736	1190	4370	* 6519	---
	10/31/2012	ENER	---	---	---	---	---	---	757	1220	4340	* 6476	---
	11/28/2012	ENER	---	---	---	---	---	---	791	1300	4220	* 6513	---
	1/31/2013	ENER	---	---	---	---	---	---	766	1240	4340	* 6540	---
	2/22/2013	ENER	---	---	---	---	---	---	777	1240	4270	* 6416	---
	3/26/2013	HMC	---	---	---	---	---	---	766	1230	4170	5467	---
	4/30/2013	ENER	---	---	---	---	---	---	789	1250	4240	* 5137	---
	12/12/2013	ENER	---	---	---	---	---	---	761	1250	4370	* 6454	---
	3/28/2014	ENER	---	---	---	---	---	---	753	1240	4400	* 6155	---
LY28-1	10/16/2009	ENER	---	---	---	---	---	---	101	358	852	* 1286	---
	11/13/2009	ENER	187	74.2	3.80	331	232	< 5.00	174	1040	1850	* 2650	0.980
	12/18/2009	ENER	308	61.7	3.40	345	399	< 5.00	184	1240	2320	* 3130	0.942
	12/30/2009	ENER	298	61.4	3.20	354	378	< 5.00	180	1220	2460	* 3163	0.961
	1/31/2010	ENER	---	---	---	---	---	---	187	1350	2550	* 3250	---
	2/22/2010	ENER	---	---	---	---	---	---	186	1350	2450	* 3250	---
	3/25/2010	ENER	---	---	---	---	---	---	183	1300	2660	* 3240	---
	4/29/2010	ENER	---	---	---	---	---	---	190	1340	2580	* 3250	---
	5/31/2010	ENER	---	---	---	---	---	---	191	1350	2550	* 3270	---
	6/30/2010	ENER	---	---	---	---	---	---	197	1380	2650	* 3280	---
	7/27/2010	ENER	---	---	---	---	---	---	201	1410	2670	* 3250	---
	8/31/2010	ENER	---	---	---	---	---	---	200	1360	2610	* 3270	---
	9/30/2010	ENER	---	---	---	---	---	---	192	1350	2700	* 3310	---
	10/31/2010	ENER	---	---	---	---	---	---	190	1330	2600	* 3290	---
	11/30/2010	ENER	---	---	---	---	---	---	191	1310	2660	* 3300	---
	1/31/2011	ENER	---	---	---	---	---	---	198	1400	2530	* 3260	---
	2/25/2011	ENER	---	---	---	---	---	---	187	1290	2590	* 3240	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY28-1	3/29/2011	HMC	---	---	---	---	---	---	---	---	---	3410	---
	4/29/2011	ENER	---	---	---	---	---	---	194	1340	2540	* 3220	---
	5/26/2011	ENER	---	---	---	---	---	---	---	1300	2520	* 3200	---
	6/30/2011	ENER	---	---	---	---	---	---	197	1350	2540	* 3220	---
	7/15/2011	ENER	---	---	---	---	---	---	193	1330	2510	* 3200	---
	8/31/2011	ENER	---	---	---	---	---	---	187	1350	2530	* 3200	---
	9/30/2011	ENER	---	---	---	---	---	---	176	1370	2660	* 3290	---
	10/31/2011	ENER	---	---	---	---	---	---	192	1390	2670	* 3470	---
	11/30/2011	ENER	---	---	---	---	---	---	183	1380	2770	* 3529	---
	12/16/2011	ENER	---	---	---	---	---	---	181	1440	2830	* 3575	---
	1/31/2012	ENER	---	---	---	---	---	---	179	1400	2630	* 3568	---
	2/29/2012	ENER	---	---	---	---	---	---	176	1380	2870	* 3540	---
	4/30/2012	ENER	---	---	---	---	---	---	190	1360	3080	* 3658	---
	5/31/2012	ENER	---	---	---	---	---	---	193	1400	3040	* 3594	---
	6/30/2012	ENER	---	---	---	---	---	---	176	1310	3000	* 3547	---
	7/27/2012	ENER	---	---	---	---	---	---	192	1400	2920	* 3538	---
	8/31/2012	ENER	---	---	---	---	---	---	181	1360	3010	* 3542	---
	9/28/2012	ENER	---	---	---	---	---	---	187	1370	2860	* 3526	---
	10/31/2012	ENER	---	---	---	---	---	---	186	1380	2920	* 3558	---
	11/28/2012	ENER	---	---	---	---	---	---	248	1180	2570	* 3297	---
	12/30/2012	ENER	---	---	---	---	---	---	291	1280	2590	* 3524	---
	1/31/2013	ENER	---	---	---	---	---	---	229	1070	2280	* 3295	---
	2/22/2013	ENER	---	---	---	---	---	---	261	1190	2690	* 3349	---
	3/26/2013	HMC	---	---	---	---	---	---	266	1170	2680	3332	---
	4/30/2013	ENER	---	---	---	---	---	---	270	1210	2670	* 3382	---
	9/17/2013	ENER	---	---	---	---	---	---	261	1180	2660	* 3377	---
	12/12/2013	ENER	---	---	---	---	---	---	269	1240	2690	* 3380	---
	3/28/2014	ENER	---	---	---	---	---	---	268	1290	2710	* 2547	---
	6/27/2014	ENER	---	---	---	---	---	---	276	1320	2720	---	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY28-1M	10/16/2009	ENER	---	---	---	---	---	---	114	84.0	440	* 698	---
LY28-2	10/16/2009	ENER	---	---	---	---	---	---	335	218	954	* 1580	---
	10/31/2011	ENER	---	---	---	---	---	---	178	3280	5170	* 6660	---
	11/30/2011	ENER	---	---	---	---	---	---	128	3560	6090	* 7221	---
	12/16/2011	ENER	---	---	---	---	---	---	139	3790	6100	* 7151	---
	1/31/2012	ENER	---	---	---	---	---	---	144	3680	6110	* 6988	---
	2/29/2012	ENER	---	---	---	---	---	---	149	3150	5350	* 6110	---
	4/30/2012	ENER	---	---	---	---	---	---	107	3130	5630	* 6062	---
	5/31/2012	ENER	---	---	---	---	---	---	90.0	3270	5500	* 6165	---
	6/30/2012	ENER	---	---	---	---	---	---	102	3630	6310	* 6761	---
	7/27/2012	ENER	---	---	---	---	---	---	156	4050	6690	* 7611	---
	8/31/2012	ENER	---	---	---	---	---	---	195	2940	5130	* 5980	---
	9/28/2012	ENER	---	---	---	---	---	---	246	2580	4860	* 5437	---
	10/31/2012	ENER	---	---	---	---	---	---	217	2300	4170	* 4840	---
	11/28/2012	ENER	---	---	---	---	---	---	257	2270	3920	* 4641	---
	12/30/2012	ENER	---	---	---	---	---	---	262	2160	3820	* 4591	---
	1/31/2013	ENER	---	---	---	---	---	---	267	2160	3830	* 4594	---
	2/22/2013	ENER	---	---	---	---	---	---	271	2060	3590	* 4429	---
	3/26/2013	HMC	---	---	---	---	---	---	276	2070	3890	4470	---
	4/30/2013	ENER	---	---	---	---	---	---	279	2120	3840	* 4509	---
	9/17/2013	ENER	---	---	---	---	---	---	263	2280	4320	* 4894	---
	12/12/2013	ENER	---	---	---	---	---	---	266	2510	4410	* 4964	---
	3/28/2014	ENER	---	---	---	---	---	---	267	2490	4310	* 3887	---
	6/27/2014	ENER	---	---	---	---	---	---	284	2550	4410	* 5075	---
	9/30/2014	HMC	---	---	---	---	---	---	---	---	---	5220	---
LY28-2M	10/16/2009	ENER	---	---	---	---	---	---	158	255	773	* 1176	---
	11/13/2009	ENER	147	60.5	7.80	106	414	6.00	128	304	937	* 1560	1.01
	12/18/2009	ENER	150	54.5	6.90	83.6	447	< 5.00	123	247	980	* 1482	0.980
	12/30/2009	ENER	143	51.5	7.30	80.2	438	< 5.00	120	202	939	* 1544	1.01

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY28-2M	1/31/2010	ENER	---	---	---	---	---	---	115	156	901	* 1320	---
	2/22/2010	ENER	---	---	---	---	---	---	113	132	756	* 1280	---
	3/25/2010	ENER	---	---	---	---	---	---	107	111	858	* 1260	---
	4/29/2010	ENER	---	---	---	---	---	---	120	106	778	* 1250	---
	5/31/2010	ENER	---	---	---	---	---	---	110	95.0	787	* 1300	---
	6/30/2010	ENER	---	---	---	---	---	---	112	93.0	847	* 1290	---
	7/27/2010	ENER	---	---	---	---	---	---	109	89.0	842	* 1230	---
	8/31/2010	ENER	---	---	---	---	---	---	112	88.0	841	* 1260	---
	9/30/2010	ENER	---	---	---	---	---	---	108	83.0	896	* 1230	---
	10/31/2010	ENER	---	---	---	---	---	---	110	84.0	891	* 1200	---
	11/30/2010	ENER	---	---	---	---	---	---	108	83.0	956	* 1220	---
	1/31/2011	ENER	---	---	---	---	---	---	108	99.0	763	* 1230	---
	2/25/2011	ENER	---	---	---	---	---	---	111	96.0	813	* 1210	---
	6/30/2011	ENER	---	---	---	---	---	---	109	99.0	760	* 1190	---
	7/15/2011	ENER	---	---	---	---	---	---	104	97.0	753	* 1160	---
	8/31/2011	ENER	---	---	---	---	---	---	902	3540	7150	* 8320	---
	9/30/2011	ENER	---	---	---	---	---	---	865	3490	6850	* 8060	---
	10/31/2011	ENER	---	---	---	---	---	---	801	3330	6450	* 7780	---
	11/30/2011	ENER	---	---	---	---	---	---	696	2820	5760	* 7006	---
	12/16/2011	ENER	---	---	---	---	---	---	651	2500	5000	* 5995	---
	1/31/2012	ENER	---	---	---	---	---	---	560	2110	4080	* 5476	---
	2/29/2012	ENER	---	---	---	---	---	---	491	1890	3750	* 4986	---
	4/30/2012	ENER	---	---	---	---	---	---	412	1570	3570	* 4284	---
	5/31/2012	ENER	---	---	---	---	---	---	320	1090	2580	* 3305	---
	6/30/2012	ENER	---	---	---	---	---	---	248	725	1900	* 2587	---
	7/27/2012	ENER	---	---	---	---	---	---	210	483	1470	* 2044	---
	8/31/2012	ENER	---	---	---	---	---	---	777	3340	6760	* 8112	---
	9/28/2012	ENER	---	---	---	---	---	---	774	2940	6240	* 7836	---
	10/31/2012	ENER	---	---	---	---	---	---	874	3120	6530	* 8181	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY28-2M	11/28/2012	ENER	---	---	---	---	---	---	953	2470	6770	* 8672	---
	12/30/2012	ENER	---	---	---	---	---	---	1030	3390	7140	* 1344	---
	1/31/2013	ENER	---	---	---	---	---	---	1050	3470	7280	* 9181	---
	2/22/2013	ENER	---	---	---	---	---	---	1020	3560	7340	* 9070	---
	3/26/2013	HMC	---	---	---	---	---	---	954	3540	7550	8840	---
	4/30/2013	ENER	---	---	---	---	---	---	919	3590	7010	* 7171	---
	9/17/2013	ENER	---	---	---	---	---	---	848	3050	6180	* 8350	---
	12/12/2013	ENER	---	---	---	---	---	---	834	3000	6170	* 7816	---
	3/28/2014	ENER	---	---	---	---	---	---	813	2900	6290	---	---
LY28-3	10/16/2009	ENER	---	---	---	---	---	---	190	781	1710	* 2476	---
	11/13/2009	ENER	306	96.9	10.00	983	421	< 5.00	290	2300	4110	* 5560	1.05
	12/18/2009	ENER	392	126	11.0	1200	399	< 5.00	318	3030	5220	* 6638	1.05
	12/30/2009	ENER	426	126	11.0	1260	394	< 5.00	339	3260	5720	* 6961	1.03
	1/31/2010	ENER	---	---	---	---	---	---	339	3380	5770	* 7250	---
	2/22/2010	ENER	---	---	---	---	---	---	344	3520	5880	* 7360	---
	3/25/2010	ENER	---	---	---	---	---	---	347	3360	6360	* 7320	---
	4/29/2010	ENER	---	---	---	---	---	---	350	3590	6340	* 7470	---
	5/31/2010	ENER	---	---	---	---	---	---	410	3730	6600	* 7920	---
	6/30/2010	ENER	---	---	---	---	---	---	471	3850	7210	* 8340	---
	7/27/2010	ENER	---	---	---	---	---	---	597	3690	7160	* 8200	---
	8/31/2010	ENER	---	---	---	---	---	---	786	3420	6660	---	---
	10/31/2011	ENER	---	---	---	---	---	---	171	943	1950	* 2760	---
	11/30/2011	ENER	---	---	---	---	---	---	353	2610	4830	* 5994	---
	12/16/2011	ENER	---	---	---	---	---	---	444	2910	5570	* 6614	---
	1/31/2012	ENER	---	---	---	---	---	---	578	3420	6560	* 7946	---
	2/29/2012	ENER	---	---	---	---	---	---	560	3390	6810	* 7983	---
	4/30/2012	ENER	---	---	---	---	---	---	668	3590	8150	* 8922	---
	5/31/2012	ENER	---	---	---	---	---	---	767	3730	8090	* 9556	---
	6/30/2012	ENER	---	---	---	---	---	---	864	3640	8600	* 9967	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY28-3	7/27/2012	ENER	---	---	---	---	---	---	1150	3830	9000	* 10950	---
	8/31/2012	ENER	---	---	---	---	---	---	1130	4310	9540	* 11460	---
	9/28/2012	ENER	---	---	---	---	---	---	1150	4350	9830	* 11790	---
	10/31/2012	ENER	---	---	---	---	---	---	1170	4260	8950	* 11370	---
	11/28/2012	ENER	---	---	---	---	---	---	610	4240	8050	* 10000	---
	12/30/2012	ENER	---	---	---	---	---	---	713	4210	8400	* 9920	---
	1/31/2013	ENER	---	---	---	---	---	---	755	4240	8310	* 10330	---
	2/22/2013	ENER	---	---	---	---	---	---	726	4110	8550	* 10250	---
	3/26/2013	HMC	---	---	---	---	---	---	781	4340	8380	10240	---
	4/30/2013	ENER	---	---	---	---	---	---	747	4300	9450	* 8585	---
	9/17/2013	ENER	---	---	---	---	---	---	740	4080	8330	* 10180	---
	12/12/2013	ENER	---	---	---	---	---	---	766	4190	8130	* 10090	---
	3/28/2014	ENER	---	---	---	---	---	---	777	4150	8370	* 8481	---
	6/27/2014	ENER	---	---	---	---	---	---	779	4090	8520	---	---
	9/30/2014	ENER	---	---	---	---	---	---	824	4440	8650	* 10190	---
LY34-1	10/16/2009	ENER	---	---	---	---	---	---	124	239	1060	* 1620	---
	12/30/2009	ENER	292	77.1	2.50	543	667	< 5.00	310	1160	2630	* 3763	1.01
	2/22/2010	ENER	---	---	---	---	---	---	321	1230	2760	* 3940	---
	3/25/2010	ENER	---	---	---	---	---	---	326	1240	3120	* 4030	---
	4/29/2010	ENER	---	---	---	---	---	---	359	1350	3130	* 4090	---
	5/31/2010	ENER	---	---	---	---	---	---	353	1340	3050	* 4140	---
	6/30/2010	ENER	---	---	---	---	---	---	362	1370	3250	* 4190	---
	7/27/2010	ENER	---	---	---	---	---	---	362	1380	3220	* 3920	---
	8/31/2010	ENER	---	---	---	---	---	---	362	1410	3490	* 4190	---
	9/30/2010	ENER	---	---	---	---	---	---	375	1450	3530	* 4490	---
	10/31/2010	ENER	---	---	---	---	---	---	514	1910	5220	* 5390	---
	11/30/2010	ENER	---	---	---	---	---	---	501	1890	4230	* 5360	---
	1/31/2011	ENER	---	---	---	---	---	---	482	1910	4370	* 5310	---
	2/25/2011	ENER	---	---	---	---	---	---	498	1970	4170	* 5400	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY34-1	3/31/2011	ENER	---	---	---	---	---	---	532	2080	4370	* 5400	---
	4/29/2011	ENER	---	---	---	---	---	---	506	1980	4240	* 5420	---
	6/30/2011	ENER	---	---	---	---	---	---	514	2040	4240	* 5430	---
	7/15/2011	ENER	---	---	---	---	---	---	489	1970	4180	* 5640	---
	8/31/2011	ENER	---	---	---	---	---	---	508	2030	4070	* 5760	---
	9/30/2011	ENER	---	---	---	---	---	---	498	2030	4140	* 5580	---
	10/31/2011	ENER	---	---	---	---	---	---	488	2040	4070	* 6620	---
	11/30/2011	ENER	---	---	---	---	---	---	494	1960	4080	* 5607	---
	12/16/2011	ENER	---	---	---	---	---	---	501	2060	4210	* 5590	---
	2/29/2012	ENER	---	---	---	---	---	---	476	1960	4000	* 5560	---
	4/30/2012	ENER	---	---	---	---	---	---	491	1980	4670	* 5623	---
	5/31/2012	ENER	---	---	---	---	---	---	465	1920	4330	---	---
	6/30/2012	ENER	---	---	---	---	---	---	468	1900	3920	* 5598	---
	7/27/2012	ENER	---	---	---	---	---	---	511	1970	4130	* 5254	---
	8/31/2012	ENER	---	---	---	---	---	---	663	2460	5060	* 6475	---
	9/28/2012	ENER	---	---	---	---	---	---	524	2560	5130	* 6571	---
	10/31/2012	ENER	---	---	---	---	---	---	426	2380	4970	* 6012	---
	11/28/2012	ENER	---	---	---	---	---	---	436	2490	5090	* 6046	---
	12/30/2012	ENER	---	---	---	---	---	---	445	2510	4810	* 6102	---
	1/31/2013	ENER	---	---	---	---	---	---	451	2500	4810	* 6091	---
	2/22/2013	ENER	---	---	---	---	---	---	437	2410	4920	* 6017	---
	3/26/2013	HMC	---	---	---	---	---	---	464	2470	4990	4990	---
	4/30/2013	ENER	---	---	---	---	---	---	462	2460	4690	* 4814	---
	9/17/2013	ENER	---	---	---	---	---	---	471	2370	4600	* 6153	---
	12/12/2013	ENER	---	---	---	---	---	---	479	2390	4920	* 6044	---
	3/28/2014	ENER	---	---	---	---	---	---	497	2510	5090	* 4932	---
	6/27/2014	ENER	---	---	---	---	---	---	507	2530	5340	---	---
	9/30/2014	ENER	---	---	---	---	---	---	535	2810	5460	* 6541	---
LY34-2	10/16/2009	ENER	---	---	---	---	---	---	96.0	214	590	* 1000	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY34-2	11/13/2009	ENER	175	69.4	12.3	354	457	< 5.00	315	676	1850	* 2950	0.985
	12/18/2009	ENER	231	84.8	10.8	387	372	< 5.00	397	868	1220	* 3413	1.00
	12/30/2009	ENER	192	85.6	11.8	436	567	< 5.00	377	799	2250	* 3339	0.977
	1/31/2010	ENER	---	---	---	---	---	---	467	1020	2500	* 3920	---
	2/22/2010	ENER	---	---	---	---	---	---	514	1190	2960	* 4160	---
	3/25/2010	ENER	---	---	---	---	---	---	515	1250	3460	* 4710	---
	4/29/2010	ENER	---	---	---	---	---	---	653	1600	3720	---	---
	5/31/2010	ENER	---	---	---	---	---	---	659	1710	3660	---	---
	6/30/2010	ENER	---	---	---	---	---	---	723	1950	4180	---	---
	7/27/2010	ENER	---	---	---	---	---	---	710	1910	4450	* 5660	---
	8/31/2010	ENER	---	---	---	---	---	---	686	1550	3470	---	---
	9/30/2010	ENER	---	---	---	---	---	---	651	1350	3640	* 4680	---
	10/31/2010	ENER	---	---	---	---	---	---	689	1880	3090	* 5650	---
	11/30/2010	ENER	---	---	---	---	---	---	632	2220	4930	* 6060	---
	1/31/2011	ENER	---	---	---	---	---	---	810	2770	5400	* 6970	---
	2/25/2011	ENER	---	---	---	---	---	---	856	2900	6220	* 7500	---
	3/31/2011	ENER	---	---	---	---	---	---	884	2940	6250	* 7620	---
	4/29/2011	ENER	---	---	---	---	---	---	911	2930	6130	* 7740	---
	5/26/2011	ENER	---	---	---	---	---	---	913	2830	6160	* 7860	---
	6/30/2011	ENER	---	---	---	---	---	---	939	2950	5980	* 7880	---
	7/13/2011	HMC	---	---	---	---	---	---	---	---	---	5640	---
	10/31/2011	ENER	---	---	---	---	---	---	57.0	124	464	* 786	---
	11/30/2011	ENER	---	---	---	---	---	---	134	321	1130	* 7740	---
	12/16/2011	ENER	---	---	---	---	---	---	143	400	1360	* 1913	---
	1/31/2012	ENER	---	---	---	---	---	---	384	868	2440	---	---
	2/29/2012	ENER	---	---	---	---	---	---	219	537	1860	---	---
	8/31/2012	ENER	---	---	---	---	---	---	453	1910	3930	* 5085	---
	9/28/2012	ENER	---	---	---	---	---	---	501	2170	4610	* 5584	---
	10/31/2012	ENER	---	---	---	---	---	---	444	2320	4670	* 5557	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY34-2	11/28/2012	ENER	---	---	---	---	---	---	417	2230	4360	* 5307	---
	12/30/2012	ENER	---	---	---	---	---	---	403	2110	4140	* 5077	---
	1/31/2013	ENER	---	---	---	---	---	---	413	2100	4080	* 5168	---
	2/22/2013	ENER	---	---	---	---	---	---	402	2010	4240	* 5080	---
	3/26/2013	HMC	---	---	---	---	---	---	424	2040	4190	5052	---
	4/30/2013	ENER	---	---	---	---	---	---	420	1990	4120	* 4023	---
	9/17/2013	ENER	---	---	---	---	---	---	442	1960	4190	* 5288	---
	12/12/2013	ENER	---	---	---	---	---	---	449	2000	4200	* 5246	---
	3/28/2014	ENER	---	---	---	---	---	---	441	1980	4160	* 4101	---
LY34-3	10/16/2009	ENER	---	---	---	---	---	---	96.0	102	637	* 920	---
	11/13/2009	ENER	90.9	44.0	4.30	229	488	6.00	128	277	956	* 1660	1.04
	12/18/2009	ENER	178	78.0	3.90	338	648	< 5.00	184	766	1900	* 2760	0.943
	12/30/2009	ENER	234	105	4.70	456	680	< 5.00	211	904	2170	* 3030	1.12
	1/31/2010	ENER	---	---	---	---	---	---	231	983	2410	* 3246	---
	2/22/2010	ENER	---	---	---	---	---	---	244	1030	2370	* 3350	---
	3/25/2010	ENER	---	---	---	---	---	---	250	1020	2630	* 3460	---
	4/29/2010	ENER	---	---	---	---	---	---	279	1100	2580	* 3520	---
	5/31/2010	ENER	---	---	---	---	---	---	287	1120	2580	* 3610	---
	6/30/2010	ENER	---	---	---	---	---	---	293	1120	2790	* 3680	---
	7/27/2010	ENER	---	---	---	---	---	---	321	1220	2780	* 3700	---
	8/31/2010	ENER	---	---	---	---	---	---	302	1130	2780	* 3780	---
	9/30/2010	ENER	---	---	---	---	---	---	322	1210	2990	* 3850	---
	10/31/2010	ENER	---	---	---	---	---	---	315	1150	2330	* 3850	---
	11/30/2010	ENER	---	---	---	---	---	---	323	1160	3030	* 3920	---
	1/31/2011	ENER	---	---	---	---	---	---	314	1170	2990	* 3960	---
	2/25/2011	ENER	---	---	---	---	---	---	329	1040	3530	* 3880	---
	3/31/2011	ENER	---	---	---	---	---	---	394	1050	2790	* 3860	---
	4/29/2011	ENER	---	---	---	---	---	---	428	996	2850	* 3950	---
	6/30/2011	ENER	---	---	---	---	---	---	541	1010	2980	* 4100	---

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY34-3	7/15/2011	ENER	---	---	---	---	---	---	566	1020	3050	* 4380	---
	8/31/2011	ENER	---	---	---	---	---	---	631	1070	3200	* 4570	---
	9/30/2011	ENER	---	---	---	---	---	---	620	1090	3210	* 4540	---
	10/31/2011	ENER	---	---	---	---	---	---	580	1140	3080	* 4510	---
	11/30/2011	ENER	---	---	---	---	---	---	603	1170	3140	* 4617	---
	12/16/2011	ENER	---	---	---	---	---	---	606	1250	3340	* 4640	---
	1/31/2012	ENER	---	---	---	---	---	---	601	1290	3410	* 4748	---
	2/29/2012	ENER	---	---	---	---	---	---	577	1280	3380	* 4610	---
	4/30/2012	ENER	---	---	---	---	---	---	552	1290	3600	* 4591	---
	5/31/2012	ENER	---	---	---	---	---	---	645	1600	4100	* 5226	---
	6/30/2012	ENER	---	---	---	---	---	---	830	2150	5800	* 6719	---
	7/27/2012	ENER	---	---	---	---	---	---	826	2310	5230	* 6765	---
	8/31/2012	ENER	---	---	---	---	---	---	1100	3310	7090	* 8925	---
	9/28/2012	ENER	---	---	---	---	---	---	871	2850	5900	* 7942	---
	10/31/2012	ENER	---	---	---	---	---	---	742	2580	5450	* 6955	---
	11/28/2012	ENER	---	---	---	---	---	---	652	2510	4570	* 6417	---
	12/30/2012	ENER	---	---	---	---	---	---	550	2270	4580	* 6023	---
	1/31/2013	ENER	---	---	---	---	---	---	466	2010	4320	* 5469	---
	2/22/2013	ENER	---	---	---	---	---	---	386	1700	3890	* 4853	---
	3/26/2013	HMC	---	---	---	---	---	---	401	1700	3860	4830	---
	4/30/2013	ENER	---	---	---	---	---	---	407	1720	3670	* 3763	---
	9/17/2013	ENER	---	---	---	---	---	---	537	2070	4480	* 5968	---
	12/12/2013	ENER	---	---	---	---	---	---	542	2080	4580	* 5830	---
	3/28/2014	ENER	---	---	---	---	---	---	495	1930	4250	* 4268	---
	6/27/2014	ENER	---	---	---	---	---	---	547	2170	4610	---	---
LY34-4	10/16/2009	ENER	---	---	---	---	---	---	74.0	322	854	* 1245	---
	11/13/2009	ENER	58.4	18.3	4.20	289	335	6.00	106	384	977	* 1660	1.03
	12/18/2009	ENER	80.3	20.7	3.70	347	329	13.0	130	501	1260	* 1996	1.05
	12/30/2009	ENER	110	22.6	3.40	331	295	8.00	146	608	1470	* 2038	0.998

* Signifies Specific Conductivity from HMC

Table A.3-1 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

Ca THROUGH ION_BAL

Sample Point	Date	Lab	Ca (mg/l)	Mg (mg/l)	K (mg/l)	Na (mg/l)	HCO3 (mg/l)	CO3 (mg/l)	Cl (mg/l)	SO4 (mg/l)	TDS (mg/l)	Cond(calc.)	Ion_B (ratio)
LY34-4	1/31/2010	ENER	---	---	---	---	---	---	163	763	1630	* 2540	---
	7/27/2010	HMC	---	---	---	---	---	---	---	---	---	4850	---
	8/31/2010	ENER	---	---	---	---	---	---	259	1350	2960	* 3930	---
	9/30/2010	ENER	---	---	---	---	---	---	269	1480	3450	---	---

* Signifies Specific Conductivity from HMC

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY1	7/22/2009	ENER	---	0.0420	0.0400	0.0300	1.14	---	---	---	---
	8/13/2009	ENER	---	0.0878	< 0.0300	0.0500	1.10	---	---	---	---
	9/23/2009	ENER	7.77	0.0519	0.0300	0.0350	1.90	---	---	---	---
	10/16/2009	ENER	---	0.0540	< 0.0300	0.0400	1.70	---	---	---	---
	11/13/2009	ENER	8.17	0.0487	< 0.0300	0.0390	2.80	---	---	---	---
	12/18/2009	ENER	7.81	0.0656	< 0.0300	0.0470	2.20	---	---	---	---
	12/30/2009	ENER	7.80	0.0585	< 0.0300	0.0790	1.80	---	---	---	---
	1/31/2010	ENER	---	0.0506	< 0.0300	0.0720	1.60	---	---	---	---
	2/22/2010	ENER	---	0.0506	< 0.0300	0.0820	1.50	---	---	---	---
	3/25/2010	ENER	---	0.0471	< 0.0300	0.105	1.40	---	---	---	---
	4/29/2010	ENER	---	0.0471	< 0.0300	0.0860	1.30	---	---	---	---
	5/31/2010	ENER	---	0.0527	0.0300	0.116	1.20	---	---	---	---
	6/30/2010	ENER	---	0.0574	< 0.0300	0.115	1.30	---	---	---	---
	7/27/2010	ENER	---	0.0532	< 0.0300	0.127	1.30	---	---	---	---
	12/16/2011	ENER	---	0.0496	< 0.0300	0.115	---	---	---	---	---
	1/31/2012	ENER	---	0.0493	< 0.0300	0.142	---	---	---	---	---
	2/29/2012	ENER	---	0.0447	< 0.0300	0.152	---	---	---	---	---
	4/30/2012	ENER	---	0.0481	< 0.0300	0.149	---	---	---	---	---
	5/31/2012	ENER	---	0.0445	< 0.0300	0.134	---	---	---	---	---
	6/30/2012	ENER	---	0.0460	< 0.0300	0.129	---	---	---	---	---
	7/27/2012	ENER	---	0.0442	< 0.0300	0.127	---	---	---	---	---
	8/31/2012	ENER	---	0.0471	< 0.0300	0.143	---	---	---	---	---
	9/28/2012	ENER	---	0.0443	< 0.0300	0.134	---	---	---	---	---
	10/31/2012	ENER	---	0.0470	< 0.0300	0.168	---	---	---	---	---
	11/28/2012	ENER	---	0.0488	< 0.0300	0.150	---	---	---	---	---
	1/31/2013	ENER	---	0.0467	< 0.0300	0.178	---	---	---	---	---
	2/22/2013	ENER	---	0.0504	< 0.0300	0.187	4.70	---	---	---	---
	3/26/2013	HMC	---	0.0475	< 0.0300	0.182	5.00	---	---	---	---
	4/30/2013	ENER	---	0.0487	< 0.0300	0.174	---	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY1	12/12/2013	ENER	---	0.0296	< 0.0300	0.0780	7.80	---	---	---	---
	3/28/2014	ENER	---	0.0287	< 0.0300	0.0910	8.40	---	---	---	---
	6/27/2014	ENER	---	0.0277	< 0.0300	0.100	8.10	---	---	---	---
	9/30/2014	ENER	---	0.0257	< 0.0300	0.0970	---	---	---	---	---
LY2	6/24/2009	ENER	---	0.0406	0.0400	0.0140	3.31	---	---	---	---
	12/16/2011	ENER	---	0.0630	< 0.0300	0.161	---	---	---	---	---
	1/31/2012	ENER	---	0.0652	< 0.0300	0.140	---	---	---	---	---
	3/31/2012	ENER	---	0.0636	< 0.0300	0.110	---	---	---	---	---
	4/30/2012	ENER	---	0.0544	< 0.0300	0.124	---	---	---	---	---
	5/31/2012	ENER	---	0.0475	< 0.0300	0.110	---	---	---	---	---
	6/30/2012	ENER	---	0.0470	< 0.0300	0.100	---	---	---	---	---
	7/27/2012	ENER	---	0.0538	< 0.0300	0.171	---	---	---	---	---
	8/31/2012	ENER	---	0.0758	< 0.0300	0.271	---	---	---	---	---
	9/28/2012	ENER	---	0.0640	< 0.0300	0.171	---	---	---	---	---
	11/28/2012	ENER	---	0.0635	< 0.0300	0.131	---	---	---	---	---
	12/30/2012	ENER	---	0.0563	< 0.0300	0.138	---	---	---	---	---
	1/31/2013	ENER	---	0.0606	< 0.0300	0.148	---	---	---	---	---
	3/28/2014	ENER	---	0.0423	< 0.0300	0.101	16.0	---	---	---	---
LY4	12/4/2008	ENER	---	0.0566	< 0.0300	0.0400	1.20	---	---	---	---
	12/5/2008	ENER	---	0.0624	< 0.0300	0.0600	0.900	---	---	---	---
	12/8/2008	ENER	---	0.0715	0.0400	0.0460	0.600	---	---	---	---
	12/11/2008	ENER	---	0.0644	< 0.0300	0.0450	0.660	---	---	---	---
	12/12/2008	ENER	---	0.0641	< 0.0300	0.0440	0.650	---	---	---	---
	1/7/2009	ENER	---	0.0813	< 0.0300	0.0410	0.870	---	---	---	---
	2/18/2009	ENER	7.44	0.0655	< 0.0300	0.0410	1.40	---	---	---	---
	3/20/2009	ENER	---	0.0732	< 0.0300	0.0430	1.72	---	---	---	---
	4/18/2009	ENER	---	0.0589	< 0.0300	0.0350	0.800	---	---	---	---
	5/15/2009	ENER	---	0.0611	< 0.0300	0.0380	1.46	---	---	---	---
	6/10/2009	ENER	---	0.0630	< 0.0300	0.0550	0.800	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY4	6/24/2009	ENER	---	0.0621	< 0.0300	0.0500	0.560	---	---	---	---
	7/22/2009	ENER	---	0.0636	< 0.0300	0.0430	0.460	---	---	---	---
	8/13/2009	ENER	---	0.0718	< 0.0300	0.0400	0.600	---	---	---	---
	9/23/2009	ENER	7.29	0.0664	< 0.0300	0.0340	0.500	---	---	---	---
	10/16/2009	ENER	---	0.0701	< 0.0300	0.0310	0.500	---	---	---	---
	11/13/2009	ENER	7.84	0.0652	< 0.0300	0.0330	0.600	---	---	---	---
	12/18/2009	ENER	7.58	0.0651	< 0.0300	0.0310	0.500	---	---	---	---
	12/30/2009	ENER	7.60	0.0643	< 0.0300	0.0340	0.600	---	---	---	---
	1/31/2010	ENER	---	0.0702	< 0.0300	0.0380	0.500	---	---	---	---
	2/22/2010	ENER	---	0.0732	< 0.0300	0.0350	0.500	---	---	---	---
	3/25/2010	ENER	---	0.0720	< 0.0300	0.0360	0.500	---	---	---	---
	4/29/2010	ENER	---	0.0699	< 0.0300	0.0380	0.600	---	---	---	---
	5/31/2010	ENER	---	0.0833	< 0.0300	0.0540	0.600	---	---	---	---
	6/30/2010	ENER	---	0.0766	< 0.0300	0.0420	0.600	---	---	---	---
	7/27/2010	ENER	---	0.0707	< 0.0300	0.0420	0.700	---	---	---	---
	8/31/2010	ENER	---	0.0708	< 0.0300	0.0420	0.800	---	---	---	---
	9/30/2010	ENER	---	0.0682	< 0.0300	0.0450	1.10	---	---	---	---
	10/31/2010	ENER	---	0.0672	< 0.0300	0.0440	---	---	---	---	---
	11/30/2010	ENER	---	0.0610	< 0.0300	0.0520	---	---	---	---	---
	1/31/2011	ENER	---	0.0514	< 0.0300	0.0590	---	---	---	---	---
	2/25/2011	ENER	---	0.0460	< 0.0300	0.0600	---	---	---	---	---
	3/31/2011	ENER	---	0.0421	< 0.0300	0.0570	---	---	---	---	---
	8/31/2011	ENER	---	0.0295	< 0.0300	0.0670	---	---	---	---	---
	9/30/2011	ENER	---	< 0.0003	< 0.0300	< 0.0050	---	---	---	---	---
	10/31/2011	ENER	---	0.0227	< 0.0300	0.0810	---	---	---	---	---
	11/30/2011	ENER	---	0.0287	< 0.0300	0.0770	---	---	---	---	---
	1/31/2012	ENER	---	0.0183	< 0.0300	0.0950	---	---	---	---	---
	4/30/2012	ENER	---	0.0226	< 0.0300	0.0980	---	---	---	---	---
	5/31/2012	ENER	---	0.0217	< 0.0300	0.0920	---	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY4	6/30/2012	ENER	---	0.0232	< 0.0300	0.0880	---	---	---	---	---
	7/27/2012	ENER	---	0.0270	< 0.0300	0.0900	---	---	---	---	---
	8/31/2012	ENER	---	0.0288	< 0.0300	0.104	---	---	---	---	---
	9/28/2012	ENER	---	0.112	< 0.0300	< 0.0050	---	---	---	---	---
	11/28/2012	ENER	---	0.0258	< 0.0300	0.108	---	---	---	---	---
	3/26/2013	HMC	---	0.0169	< 0.0300	0.114	1.10	---	---	---	---
	3/28/2014	ENER	---	0.0122	< 0.0300	0.119	1.10	---	---	---	---
	6/27/2014	ENER	---	0.0118	< 0.0300	0.131	1.20	---	---	---	---
	9/30/2014	ENER	---	0.0139	< 0.0300	0.134	---	---	---	---	---
LY4ML	4/18/2009	ENER	---	0.0188	0.120	0.0050	0.200	---	---	---	---
	6/24/2009	ENER	---	0.358	0.110	<. 0.0050	10.00	---	---	---	---
	7/22/2009	ENER	---	0.552	0.0900	0.0100	0.0200	---	---	---	---
	8/13/2009	ENER	---	0.421	0.0600	< 0.0050	< 0.100	---	---	---	---
	9/23/2009	ENER	7.76	0.268	0.0400	0.0100	< 0.100	---	---	---	---
	10/16/2009	ENER	---	0.244	0.0400	0.0060	< 0.100	---	---	---	---
	11/13/2009	ENER	8.35	0.508	0.0900	0.0110	< 0.100	---	---	---	---
	12/18/2009	ENER	7.55	0.214	< 0.0300	0.0050	< 0.100	---	---	---	---
	4/29/2010	ENER	---	0.292	0.0500	0.0110	< 0.100	---	---	---	---
	5/31/2010	ENER	---	0.463	0.0900	0.0150	< 0.100	---	---	---	---
	6/30/2010	ENER	---	0.482	0.110	0.0120	< 0.100	---	---	---	---
	7/27/2010	ENER	---	0.375	0.0900	0.0170	< 0.100	---	---	---	---
	8/31/2010	ENER	---	0.366	0.0900	0.0150	< 0.100	---	---	---	---
	9/30/2010	ENER	---	0.394	0.100	0.0130	< 0.100	---	---	---	---
	10/31/2010	ENER	---	0.394	0.100	0.0140	---	---	---	---	---
	11/30/2010	ENER	---	0.453	0.140	0.0180	---	---	---	---	---
	4/29/2011	ENER	---	0.461	0.570	0.0430	---	---	---	---	---
	10/31/2011	ENER	---	0.660	0.0600	0.0260	---	---	---	---	---
LY4MU	7/22/2009	ENER	---	0.261	0.140	0.0100	0.0200	---	---	---	---
	8/13/2009	ENER	---	0.596	0.160	0.0060	< 0.100	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY4MU	9/23/2009	ENER	7.68	0.563	0.120	0.0090	< 0.100	---	---	---	---
	10/16/2009	ENER	---	0.557	0.100	0.0090	< 0.100	---	---	---	---
	11/13/2009	ENER	8.04	0.212	0.0300	0.0090	< 0.100	---	---	---	---
	1/31/2010	ENER	---	0.504	0.0500	0.0100	< 0.100	---	---	---	---
	2/22/2010	ENER	---	0.516	0.0500	0.0100	0.800	---	---	---	---
	3/25/2010	ENER	---	0.574	0.0500	0.0100	1.80	---	---	---	---
	4/29/2010	ENER	---	0.546	0.0400	0.0120	2.30	---	---	---	---
	5/31/2010	ENER	---	0.626	0.0400	0.0130	3.20	---	---	---	---
	6/30/2010	ENER	---	0.617	0.0400	0.0090	3.50	---	---	---	---
	7/27/2010	ENER	---	0.600	0.0400	0.0110	3.50	---	---	---	---
	8/31/2010	ENER	---	0.0395	0.350	0.0460	4.10	---	---	---	---
	9/30/2010	ENER	---	0.691	0.0500	0.0060	3.80	---	---	---	---
	10/31/2010	ENER	---	0.633	0.0400	0.0060	---	---	---	---	---
	11/30/2010	ENER	---	0.628	0.0400	0.0100	---	---	---	---	---
	1/31/2011	ENER	---	0.644	0.0400	0.0130	---	---	---	---	---
	2/25/2011	ENER	---	0.662	0.0400	0.0140	---	---	---	---	---
	4/29/2011	ENER	---	0.632	0.0500	0.0120	---	---	---	---	---
	5/26/2011	ENER	---	0.617	0.0500	0.0120	---	---	---	---	---
	6/30/2011	ENER	---	0.649	0.0500	0.0180	---	---	---	---	---
	7/15/2011	ENER	---	0.569	0.0600	0.0100	---	---	---	---	---
	8/31/2011	ENER	---	0.582	0.0600	0.0100	---	---	---	---	---
	9/30/2011	ENER	---	0.646	0.0600	0.0060	---	---	---	---	---
	10/31/2011	ENER	---	0.660	0.0600	0.0260	---	---	---	---	---
	11/30/2011	ENER	---	0.640	0.0600	0.0180	---	---	---	---	---
	1/31/2012	ENER	---	0.593	0.0600	0.0130	---	---	---	---	---
	2/29/2012	ENER	---	0.610	0.0900	0.0170	---	---	---	---	---
	3/31/2012	ENER	---	0.610	0.0600	0.0090	---	---	---	---	---
	4/30/2012	ENER	---	0.582	0.0600	0.0100	---	---	---	---	---
	5/31/2012	ENER	---	0.600	0.0600	0.0110	---	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY4MU	6/30/2012	ENER	---	0.586	0.0600	0.0120	---	---	---	---	---
	7/27/2012	ENER	---	0.592	0.0600	0.0050	---	---	---	---	---
	8/31/2012	ENER	---	0.573	0.0600	< 0.0050	---	---	---	---	---
	9/28/2012	ENER	---	0.145	0.0400	0.518	---	---	---	---	---
	10/31/2012	ENER	---	0.554	0.0600	0.0060	---	---	---	---	---
	11/28/2012	ENER	---	0.550	0.0600	< 0.0050	---	---	---	---	---
	1/31/2013	ENER	---	0.544	0.0600	0.0060	---	---	---	---	---
	2/22/2013	ENER	---	0.526	0.0700	0.0130	7.10	---	---	---	---
	3/26/2013	HMC	---	0.491	0.0600	0.0050	7.10	---	---	---	---
	4/30/2013	ENER	---	0.497	0.0600	0.0090	---	---	---	---	---
	12/12/2013	ENER	---	0.463	0.0700	0.0090	9.90	---	---	---	---
	3/28/2014	ENER	---	0.426	0.0700	0.0150	8.90	---	---	---	---
LY28-1	10/16/2009	ENER	---	0.0224	0.0500	0.0100	2.60	---	---	---	---
	11/13/2009	ENER	8.19	0.0489	< 0.0300	0.0250	4.40	---	---	---	---
	12/18/2009	ENER	7.77	0.131	< 0.0300	0.0310	0.900	---	---	---	---
	12/30/2009	ENER	7.83	0.161	< 0.0300	0.0420	6.60	---	---	---	---
	1/31/2010	ENER	---	0.149	< 0.0300	0.0370	6.70	---	---	---	---
	2/22/2010	ENER	---	0.161	< 0.0300	0.0380	6.10	---	---	---	---
	3/25/2010	ENER	---	0.161	< 0.0300	0.0400	7.90	---	---	---	---
	4/29/2010	ENER	---	0.150	< 0.0300	0.0390	7.50	---	---	---	---
	5/31/2010	ENER	---	0.194	0.0300	0.0490	7.60	---	---	---	---
	6/30/2010	ENER	---	0.183	< 0.0300	0.0410	7.20	---	---	---	---
	7/27/2010	ENER	---	0.171	< 0.0300	0.0440	8.00	---	---	---	---
	8/31/2010	ENER	---	0.187	< 0.0300	0.0470	7.50	---	---	---	---
	9/30/2010	ENER	---	0.194	< 0.0300	0.0450	7.30	---	---	---	---
	10/31/2010	ENER	---	0.191	0.0800	0.0610	---	---	---	---	---
	11/30/2010	ENER	---	0.168	< 0.0300	0.0470	---	---	---	---	---
	1/31/2011	ENER	---	0.149	< 0.0300	0.0550	---	---	---	---	---
	2/25/2011	ENER	---	0.135	0.0500	0.0590	---	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY28-1	4/29/2011	ENER	---	0.132	0.0400	0.0630	---	---	---	---	---
	5/26/2011	ENER	---	0.121	< 0.0300	0.0620	---	---	---	---	---
	6/30/2011	ENER	---	0.111	< 0.0300	0.0670	---	---	---	---	---
	7/15/2011	ENER	---	0.112	< 0.0300	0.0570	---	---	---	---	---
	8/31/2011	ENER	---	0.114	< 0.0300	0.0510	---	---	---	---	---
	9/30/2011	ENER	---	0.137	< 0.0300	0.0500	---	---	---	---	---
	10/31/2011	ENER	---	0.128	< 0.0300	0.0780	---	---	---	---	---
	11/30/2011	ENER	---	0.194	< 0.0300	0.0700	---	---	---	---	---
	12/16/2011	ENER	---	0.193	< 0.0300	0.0540	---	---	---	---	---
	1/31/2012	ENER	---	0.198	< 0.0300	0.0750	---	---	---	---	---
	2/29/2012	ENER	---	0.210	< 0.0300	0.0650	---	---	---	---	---
	4/30/2012	ENER	---	0.200	< 0.0300	0.0560	---	---	---	---	---
	5/31/2012	ENER	---	0.206	< 0.0300	0.0590	---	---	---	---	---
	6/30/2012	ENER	---	0.200	< 0.0300	0.0530	---	---	---	---	---
	7/27/2012	ENER	---	0.202	< 0.0300	0.0500	---	---	---	---	---
	8/31/2012	ENER	---	0.198	< 0.0300	0.0560	---	---	---	---	---
	9/28/2012	ENER	---	0.206	< 0.0300	0.0490	---	---	---	---	---
	10/31/2012	ENER	---	0.201	< 0.0300	0.0560	---	---	---	---	---
	11/28/2012	ENER	---	0.212	< 0.0300	0.0460	---	---	---	---	---
	12/30/2012	ENER	---	0.195	< 0.0300	0.0430	---	---	---	---	---
	1/31/2013	ENER	---	0.200	< 0.0300	0.0460	---	---	---	---	---
	2/22/2013	ENER	---	0.203	< 0.0300	0.0460	21.0	---	---	---	---
	3/26/2013	HMC	---	0.196	< 0.0300	0.0430	21.0	---	---	---	---
	4/30/2013	ENER	---	0.188	0.0600	0.0380	---	---	---	---	---
	9/17/2013	ENER	---	0.153	< 0.0300	0.0440	21.0	---	---	---	---
	12/12/2013	ENER	---	0.131	< 0.0300	0.0340	21.0	---	---	---	---
	3/28/2014	ENER	---	0.107	< 0.0300	0.0410	21.0	---	---	---	---
	6/27/2014	ENER	---	0.0418	< 0.0300	0.0410	19.0	---	---	---	---
LY28-1M	10/16/2009	ENER	---	0.0009	0.160	0.0070	1.40	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY28-2	10/16/2009	ENER	---	0.0031	0.0500	0.0140	1.10	---	---	---	---
	10/31/2011	ENER	---	0.415	0.180	0.0760	---	---	---	---	---
	11/30/2011	ENER	---	0.770	0.0400	0.0430	---	---	---	---	---
	12/16/2011	ENER	---	0.932	0.0600	0.0190	---	---	---	---	---
	1/31/2012	ENER	---	0.884	0.0300	0.0310	---	---	---	---	---
	2/29/2012	ENER	---	0.762	< 0.0300	0.0470	---	---	---	---	---
	4/30/2012	ENER	---	0.641	< 0.0300	0.0470	---	---	---	---	---
	5/31/2012	ENER	---	0.572	< 0.0300	0.0480	---	---	---	---	---
	6/30/2012	ENER	---	0.533	< 0.0300	0.0480	---	---	---	---	---
	7/27/2012	ENER	---	0.432	< 0.0300	0.0510	---	---	---	---	---
	8/31/2012	ENER	---	0.867	< 0.0300	0.0510	---	---	---	---	---
	9/28/2012	ENER	---	0.814	< 0.0300	0.0490	---	---	---	---	---
	10/31/2012	ENER	---	0.624	< 0.0300	0.0530	---	---	---	---	---
	11/28/2012	ENER	---	0.521	< 0.0300	0.0560	---	---	---	---	---
	12/30/2012	ENER	---	0.418	< 0.0300	0.0600	---	---	---	---	---
	1/31/2013	ENER	---	0.411	< 0.0300	0.0660	---	---	---	---	---
	2/22/2013	ENER	---	0.374	< 0.0300	0.0750	21.0	---	---	---	---
	3/26/2013	HMC	---	0.328	< 0.0300	0.0770	22.0	---	---	---	---
	4/30/2013	ENER	---	0.283	0.0600	0.0740	---	---	---	---	---
	9/17/2013	ENER	---	0.190	< 0.0300	0.0960	32.0	---	---	---	---
	12/12/2013	ENER	---	0.136	< 0.0300	0.0870	30.0	---	---	---	---
	3/28/2014	ENER	---	0.116	< 0.0300	0.0920	26.0	---	---	---	---
	6/27/2014	ENER	---	0.249	< 0.0300	0.110	28.0	---	---	---	---
	9/30/2014	ENER	---	0.110	< 0.0300	0.108	---	---	---	---	---
LY28-2M	10/16/2009	ENER	---	0.0044	0.160	0.0110	1.80	---	---	---	---
	11/13/2009	ENER	8.15	0.0327	0.120	< 0.0050	2.30	---	---	---	---
	12/18/2009	ENER	7.73	0.0567	0.100	< 0.0050	5.90	---	---	---	---
	12/30/2009	ENER	7.87	0.0641	0.0900	< 0.0050	6.30	---	---	---	---
	1/31/2010	ENER	---	0.0489	0.0900	< 0.0050	6.40	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY28-2M	2/22/2010	ENER	---	0.0558	0.0900	0.0060	7.10	---	---	---	---
	3/25/2010	ENER	---	0.0581	0.100	0.0070	7.40	---	---	---	---
	4/29/2010	ENER	---	0.0552	0.0800	0.0060	7.60	---	---	---	---
	5/31/2010	ENER	---	0.0619	0.110	0.0090	8.70	---	---	---	---
	6/30/2010	ENER	---	0.0117	< 0.0300	< 0.0050	9.00	---	---	---	---
	7/27/2010	ENER	---	0.0502	0.0900	0.0080	10.00	---	---	---	---
	8/31/2010	ENER	---	0.0504	0.0800	0.0080	9.70	---	---	---	---
	9/30/2010	ENER	---	0.0534	0.100	0.0060	9.70	---	---	---	---
	10/31/2010	ENER	---	0.0475	0.140	0.0090	---	---	---	---	---
	11/30/2010	ENER	---	0.0396	0.100	0.0090	---	---	---	---	---
	1/31/2011	ENER	---	0.0480	0.100	0.0110	---	---	---	---	---
	2/25/2011	ENER	---	0.0433	0.150	0.0130	---	---	---	---	---
	6/30/2011	ENER	---	0.0368	0.130	0.0130	---	---	---	---	---
	7/15/2011	ENER	---	0.0344	0.130	0.0080	---	---	---	---	---
	8/31/2011	ENER	---	0.340	0.0400	0.150	---	---	---	---	---
	9/30/2011	ENER	---	0.369	0.0500	0.133	---	---	---	---	---
	10/31/2011	ENER	---	0.367	0.0600	0.153	---	---	---	---	---
	11/30/2011	ENER	---	0.334	0.0800	0.157	---	---	---	---	---
	12/16/2011	ENER	---	0.263	0.0800	0.108	---	---	---	---	---
	1/31/2012	ENER	---	0.222	0.0900	0.103	---	---	---	---	---
	2/29/2012	ENER	---	0.199	0.0900	0.0840	---	---	---	---	---
	4/30/2012	ENER	---	0.153	0.0900	0.0720	---	---	---	---	---
	5/31/2012	ENER	---	0.100	0.0900	0.0550	---	---	---	---	---
	6/30/2012	ENER	---	0.0659	0.100	0.0370	---	---	---	---	---
	7/27/2012	ENER	---	0.0512	0.100	0.0220	---	---	---	---	---
	8/31/2012	ENER	---	0.444	0.260	0.109	---	---	---	---	---
	9/28/2012	ENER	---	0.313	0.280	0.122	---	---	---	---	---
	10/31/2012	ENER	---	0.346	0.230	0.150	---	---	---	---	---
	11/28/2012	ENER	---	0.368	0.160	0.148	---	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY28-2M	12/30/2012	ENER	---	0.334	0.180	0.155	---	---	---	---	---
	1/31/2013	ENER	---	0.389	0.160	0.161	---	---	---	---	---
	2/22/2013	ENER	---	0.382	0.150	0.158	54.0	---	---	---	---
	3/26/2013	HMC	---	0.418	0.120	0.132	45.0	---	---	---	---
	4/30/2013	ENER	---	0.401	0.110	0.124	---	---	---	---	---
	9/17/2013	ENER	---	0.341	0.110	0.134	45.0	---	---	---	---
	12/12/2013	ENER	---	0.338	0.110	0.0990	38.0	---	---	---	---
	3/28/2014	ENER	---	0.330	0.100	0.110	32.0	---	---	---	---
LY28-3	10/16/2009	ENER	---	0.0875	0.100	0.0230	21.0	---	---	---	---
	11/13/2009	ENER	8.11	0.487	0.100	0.0500	43.5	---	---	---	---
	12/18/2009	ENER	7.87	0.553	< 0.0300	0.0420	53.7	---	---	---	---
	12/30/2009	ENER	7.90	0.628	< 0.0300	0.0480	55.3	---	---	---	---
	1/31/2010	ENER	---	0.694	< 0.0300	0.0490	60.0	---	---	---	---
	2/22/2010	ENER	---	0.758	< 0.0300	0.0520	63.7	---	---	---	---
	3/25/2010	ENER	---	0.707	< 0.0300	0.0450	58.9	---	---	---	---
	4/29/2010	ENER	---	0.710	0.0500	0.0580	52.0	---	---	---	---
	5/31/2010	ENER	---	0.971	0.110	0.0940	54.0	---	---	---	---
	6/30/2010	ENER	---	0.973	0.0400	0.0910	62.0	---	---	---	---
	7/27/2010	ENER	---	0.781	< 0.0300	0.105	72.0	---	---	---	---
	8/31/2010	ENER	---	0.809	< 0.0300	0.167	74.0	---	---	---	---
	10/31/2011	ENER	---	0.0790	0.0500	0.0150	---	---	---	---	---
	11/30/2011	ENER	---	0.587	0.0400	0.0430	---	---	---	---	---
	12/16/2011	ENER	---	0.677	0.0400	0.0440	---	---	---	---	---
	1/31/2012	ENER	---	0.796	0.0500	0.0880	---	---	---	---	---
	2/29/2012	ENER	---	0.870	0.0600	0.0730	---	---	---	---	---
	4/30/2012	ENER	---	0.864	0.0600	0.0840	---	---	---	---	---
	5/31/2012	ENER	---	0.929	0.0500	0.0920	---	---	---	---	---
	6/30/2012	ENER	---	1.03	0.0500	0.104	---	---	---	---	---
	7/27/2012	ENER	---	1.22	0.0400	0.117	---	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY28-3	8/31/2012	ENER	---	1.50	< 0.0300	0.126	---	---	---	---	---
	9/28/2012	ENER	---	1.67	< 0.0300	0.144	---	---	---	---	---
	10/31/2012	ENER	---	1.55	< 0.0300	0.148	---	---	---	---	---
	11/28/2012	ENER	---	1.57	< 0.0300	0.0580	---	---	---	---	---
	12/30/2012	ENER	---	1.33	< 0.0300	0.0650	---	---	---	---	---
	1/31/2013	ENER	---	1.59	< 0.0300	0.0780	---	---	---	---	---
	2/22/2013	ENER	---	1.49	< 0.0300	0.0850	151	---	---	---	---
	3/26/2013	HMC	---	1.49	< 0.0300	0.0740	147	---	---	---	---
	4/30/2013	ENER	---	1.42	0.0400	0.0700	---	---	---	---	---
	9/17/2013	ENER	---	1.01	0.0400	0.0810	156	---	---	---	---
	12/12/2013	ENER	---	0.855	0.0500	0.0730	156	---	---	---	---
	3/28/2014	ENER	---	0.718	0.0500	0.0810	160	---	---	---	---
	6/27/2014	ENER	---	0.620	0.0600	0.0850	162	---	---	---	---
	9/30/2014	ENER	---	0.696	0.0500	0.0800	---	---	---	---	---
LY34-1	10/16/2009	ENER	---	0.0837	0.0800	0.0090	2.80	---	---	---	---
	12/30/2009	ENER	7.80	0.375	< 0.0300	0.0540	10.1	---	---	---	---
	2/22/2010	ENER	---	0.368	0.0400	0.0470	11.7	---	---	---	---
	3/25/2010	ENER	---	0.312	< 0.0300	0.0450	13.7	---	---	---	---
	4/29/2010	ENER	---	0.279	< 0.0300	0.0460	14.5	---	---	---	---
	5/31/2010	ENER	---	0.324	0.0500	0.0610	15.2	---	---	---	---
	6/30/2010	ENER	---	0.332	0.0400	0.0470	14.8	---	---	---	---
	7/27/2010	ENER	---	0.272	0.0400	0.0450	15.0	---	---	---	---
	8/31/2010	ENER	---	0.231	< 0.0300	0.0490	15.9	---	---	---	---
	9/30/2010	ENER	---	0.317	< 0.0300	0.0610	30.0	---	---	---	---
	10/31/2010	ENER	---	0.310	< 0.0300	0.0680	---	---	---	---	---
	11/30/2010	ENER	---	0.339	< 0.0300	0.0720	---	---	---	---	---
	1/31/2011	ENER	---	0.340	< 0.0300	0.0610	---	---	---	---	---
	2/25/2011	ENER	---	0.362	< 0.0300	0.0780	---	---	---	---	---
	3/31/2011	ENER	---	0.367	< 0.0300	0.0670	---	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY34-1	4/29/2011	ENER	---	0.401	0.0500	0.0940	---	---	---	---	---
	6/30/2011	ENER	---	0.328	< 0.0300	0.0960	---	---	---	---	---
	7/15/2011	ENER	---	0.345	0.0400	0.0880	---	---	---	---	---
	8/31/2011	ENER	---	0.328	0.0600	0.0720	---	---	---	---	---
	9/30/2011	ENER	---	0.292	0.0600	0.0680	---	---	---	---	---
	10/31/2011	ENER	---	0.284	0.0700	0.0720	---	---	---	---	---
	11/30/2011	ENER	---	0.279	0.0700	0.0800	---	---	---	---	---
	12/16/2011	ENER	---	0.267	0.0800	0.0620	---	---	---	---	---
	2/29/2012	ENER	---	0.285	0.0700	0.0760	---	---	---	---	---
	4/30/2012	ENER	---	0.265	0.0600	0.0780	---	---	---	---	---
	5/31/2012	ENER	---	0.279	0.0600	0.0730	---	---	---	---	---
	6/30/2012	ENER	---	0.271	0.0600	0.0660	---	---	---	---	---
	7/27/2012	ENER	---	0.178	< 0.0300	0.0560	---	---	---	---	---
	8/31/2012	ENER	---	0.309	< 0.0300	0.0870	---	---	---	---	---
	9/28/2012	ENER	---	0.377	< 0.0300	0.0570	---	---	---	---	---
	10/31/2012	ENER	---	0.432	< 0.0300	0.0540	---	---	---	---	---
	11/28/2012	ENER	---	0.432	< 0.0300	0.0490	---	---	---	---	---
	12/30/2012	ENER	---	0.420	< 0.0300	0.0500	---	---	---	---	---
	1/31/2013	ENER	---	0.460	< 0.0300	0.0540	---	---	---	---	---
	2/22/2013	ENER	---	0.456	< 0.0300	0.0590	69.0	---	---	---	---
	3/26/2013	HMC	---	0.445	< 0.0300	0.0540	68.0	---	---	---	---
	4/30/2013	ENER	---	0.446	< 0.0300	0.0500	---	---	---	---	---
	9/17/2013	ENER	---	0.353	< 0.0300	0.0570	72.0	---	---	---	---
	12/12/2013	ENER	---	0.340	< 0.0300	0.0500	72.0	---	---	---	---
	3/28/2014	ENER	---	0.330	< 0.0300	0.0600	78.0	---	---	---	---
	6/27/2014	ENER	---	0.350	< 0.0300	0.0670	78.0	---	---	---	---
	9/30/2014	ENER	---	0.323	< 0.0300	0.0720	---	---	---	---	---
LY34-2	10/16/2009	ENER	---	0.0067	0.140	0.0060	< 0.100	---	---	---	---
	11/13/2009	ENER	8.34	0.0695	0.110	0.0150	2.40	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY34-2	12/18/2009	ENER	7.94	0.0871	0.0800	0.0190	7.50	---	---	---	---
	12/30/2009	ENER	7.98	0.0876	0.100	0.0210	8.30	---	---	---	---
	1/31/2010	ENER	---	0.0962	0.0800	0.0300	12.5	---	---	---	---
	2/22/2010	ENER	---	0.118	0.0900	0.0330	9.40	---	---	---	---
	3/25/2010	ENER	---	0.126	0.0800	0.0350	14.0	---	---	---	---
	4/29/2010	ENER	---	0.142	0.0800	0.0440	12.0	---	---	---	---
	5/31/2010	ENER	---	0.192	0.110	0.0550	11.4	---	---	---	---
	6/30/2010	ENER	---	0.222	0.120	0.0600	12.8	---	---	---	---
	7/27/2010	ENER	---	0.202	0.100	0.0590	12.1	---	---	---	---
	8/31/2010	ENER	---	0.104	0.0500	0.0430	8.00	---	---	---	---
	9/30/2010	ENER	---	0.0932	0.0400	0.0370	6.20	---	---	---	---
	10/31/2010	ENER	---	0.195	0.0600	0.0600	---	---	---	---	---
	11/30/2010	ENER	---	0.406	0.0700	0.0690	---	---	---	---	---
	1/31/2011	ENER	---	0.379	0.0400	0.0700	---	---	---	---	---
	2/25/2011	ENER	---	0.388	0.0500	0.0850	---	---	---	---	---
	3/31/2011	ENER	---	0.389	0.0400	0.0830	---	---	---	---	---
	4/29/2011	ENER	---	0.394	0.0900	0.114	---	---	---	---	---
	5/26/2011	ENER	---	0.343	0.0400	0.0790	---	---	---	---	---
	6/30/2011	ENER	---	0.311	0.0400	0.113	---	---	---	---	---
	10/31/2011	ENER	---	0.0861	0.260	0.0130	---	---	---	---	---
	11/30/2011	ENER	---	0.184	0.300	0.0140	---	---	---	---	---
	12/16/2011	ENER	---	0.169	0.210	0.0070	---	---	---	---	---
	1/31/2012	ENER	---	0.183	0.120	0.0640	---	---	---	---	---
	2/29/2012	ENER	---	0.0973	0.180	0.0100	---	---	---	---	---
	8/31/2012	ENER	---	0.0998	0.0400	0.0450	---	---	---	---	---
	9/28/2012	ENER	---	0.0642	< 0.0300	0.0580	---	---	---	---	---
	10/31/2012	ENER	---	0.0660	< 0.0300	0.0560	---	---	---	---	---
	11/28/2012	ENER	---	0.0706	< 0.0300	0.0510	---	---	---	---	---
	12/30/2012	ENER	---	0.0664	< 0.0300	0.0500	---	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY34-2	1/31/2013	ENER	---	0.0722	< 0.0300	0.0490	---	---	---	---	---
	2/22/2013	ENER	---	0.0737	< 0.0300	0.0530	10.7	---	---	---	---
	3/26/2013	HMC	---	0.0737	< 0.0300	0.0500	10.00	---	---	---	---
	4/30/2013	ENER	---	0.0758	0.0400	0.0450	---	---	---	---	---
	9/17/2013	ENER	---	0.0913	< 0.0300	0.0520	12.0	---	---	---	---
	12/12/2013	ENER	---	0.0932	0.0300	0.0440	16.0	---	---	---	---
	3/28/2014	ENER	---	0.0993	< 0.0300	0.0540	17.1	---	---	---	---
	9/30/2014	ENER	---	0.0877	0.0300	0.0560	---	---	---	---	---
LY34-3	10/16/2009	ENER	---	0.0051	0.130	0.0070	1.50	---	---	---	---
	11/13/2009	ENER	8.24	0.0749	0.210	0.0250	3.60	---	---	---	---
	12/18/2009	ENER	7.91	0.239	0.0800	0.0420	7.10	---	---	---	---
	12/30/2009	ENER	7.92	0.349	0.0600	0.0740	7.60	---	---	---	---
	1/31/2010	ENER	---	0.269	0.0700	0.0600	9.20	---	---	---	---
	2/22/2010	ENER	---	0.292	0.0700	0.0630	0.500	---	---	---	---
	3/25/2010	ENER	---	0.282	0.0700	0.0640	10.5	---	---	---	---
	4/29/2010	ENER	---	0.243	0.0600	0.0620	9.60	---	---	---	---
	5/31/2010	ENER	---	0.291	0.0900	0.0880	9.60	---	---	---	---
	6/30/2010	ENER	---	0.266	0.0600	0.0700	8.80	---	---	---	---
	7/27/2010	ENER	---	0.254	0.0600	0.0710	8.20	---	---	---	---
	8/31/2010	ENER	---	0.250	0.0500	0.0800	6.70	---	---	---	---
	9/30/2010	ENER	---	0.287	0.0600	0.0730	5.00	---	---	---	---
	10/31/2010	ENER	---	0.275	0.120	0.103	---	---	---	---	---
	11/30/2010	ENER	---	0.279	0.0500	0.0720	---	---	---	---	---
	1/31/2011	ENER	---	0.285	0.0500	0.0920	---	---	---	---	---
	2/25/2011	ENER	---	0.274	0.110	0.102	---	---	---	---	---
	3/31/2011	ENER	---	0.224	0.0300	0.0620	---	---	---	---	---
	4/29/2011	ENER	---	0.267	0.120	0.0940	---	---	---	---	---
	6/30/2011	ENER	---	0.223	< 0.0300	0.103	---	---	---	---	---
	7/15/2011	ENER	---	0.229	< 0.0300	0.0990	---	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY34-3	8/31/2011	ENER	---	0.266	0.0300	0.0710	---	---	---	---	---
	9/30/2011	ENER	---	0.222	0.0300	0.0660	---	---	---	---	---
	10/31/2011	ENER	---	0.201	0.0400	0.122	---	---	---	---	---
	11/30/2011	ENER	---	0.274	0.0400	0.112	---	---	---	---	---
	12/16/2011	ENER	---	0.288	0.0300	0.0770	---	---	---	---	---
	1/31/2012	ENER	---	0.268	0.0400	0.0990	---	---	---	---	---
	2/29/2012	ENER	---	0.291	0.0400	0.0930	---	---	---	---	---
	4/30/2012	ENER	---	0.260	0.0400	0.0900	---	---	---	---	---
	5/31/2012	ENER	---	0.339	0.0400	0.121	---	---	---	---	---
	6/30/2012	ENER	---	0.458	0.0600	0.174	---	---	---	---	---
	7/27/2012	ENER	---	0.436	0.0600	0.177	---	---	---	---	---
	8/31/2012	ENER	---	0.544	0.0800	0.280	---	---	---	---	---
	9/28/2012	ENER	---	0.536	0.0700	0.248	---	---	---	---	---
	10/31/2012	ENER	---	0.509	0.0600	0.223	---	---	---	---	---
	11/28/2012	ENER	---	0.467	0.0300	0.172	---	---	---	---	---
	12/30/2012	ENER	---	0.427	0.0500	0.169	---	---	---	---	---
	1/31/2013	ENER	---	0.412	0.0500	0.142	---	---	---	---	---
	2/22/2013	ENER	---	0.384	0.0400	0.137	15.9	---	---	---	---
	3/26/2013	HMC	---	0.376	0.0400	0.133	16.0	---	---	---	---
	4/30/2013	ENER	---	0.368	< 0.0300	0.122	---	---	---	---	---
	9/17/2013	ENER	---	0.416	0.0600	0.173	15.0	---	---	---	---
	12/12/2013	ENER	---	0.396	0.0700	0.149	19.6	---	---	---	---
	3/28/2014	ENER	---	0.353	0.0600	0.158	15.7	---	---	---	---
	6/27/2014	ENER	---	0.414	0.0700	0.199	5.30	---	---	---	---
LY34-4	10/16/2009	ENER	---	0.0261	0.280	0.0050	1.40	---	---	---	---
	11/13/2009	ENER	8.38	0.0613	0.310	0.0110	4.20	---	---	---	---
	12/18/2009	ENER	8.34	0.0714	0.280	0.0130	12.4	---	---	---	---
	12/30/2009	ENER	8.36	0.0671	0.230	0.0180	15.8	---	---	---	---
	1/31/2010	ENER	---	0.0574	0.270	0.0220	22.9	---	---	---	---

Table A.3-2 WATER QUALITY ANALYSIS FOR LYSIMETERS (cont.)

pH THROUGH Th-230

Sample Point	Date	Lab	pH (std. units)	Unat (mg/l)	Mo (mg/l)	Se (mg/l)	NO3 (mg/l)	Ra226 (pCi/l)	Ra228 (pCi/l)	V (mg/l)	Th230 (pCi/l)
LY34-4	8/31/2010	ENER	---	0.0397	0.320	0.0480	49.0	---	---	---	---
	9/30/2010	ENER	---	0.0749	0.460	0.0510	53.0	---	---	---	---

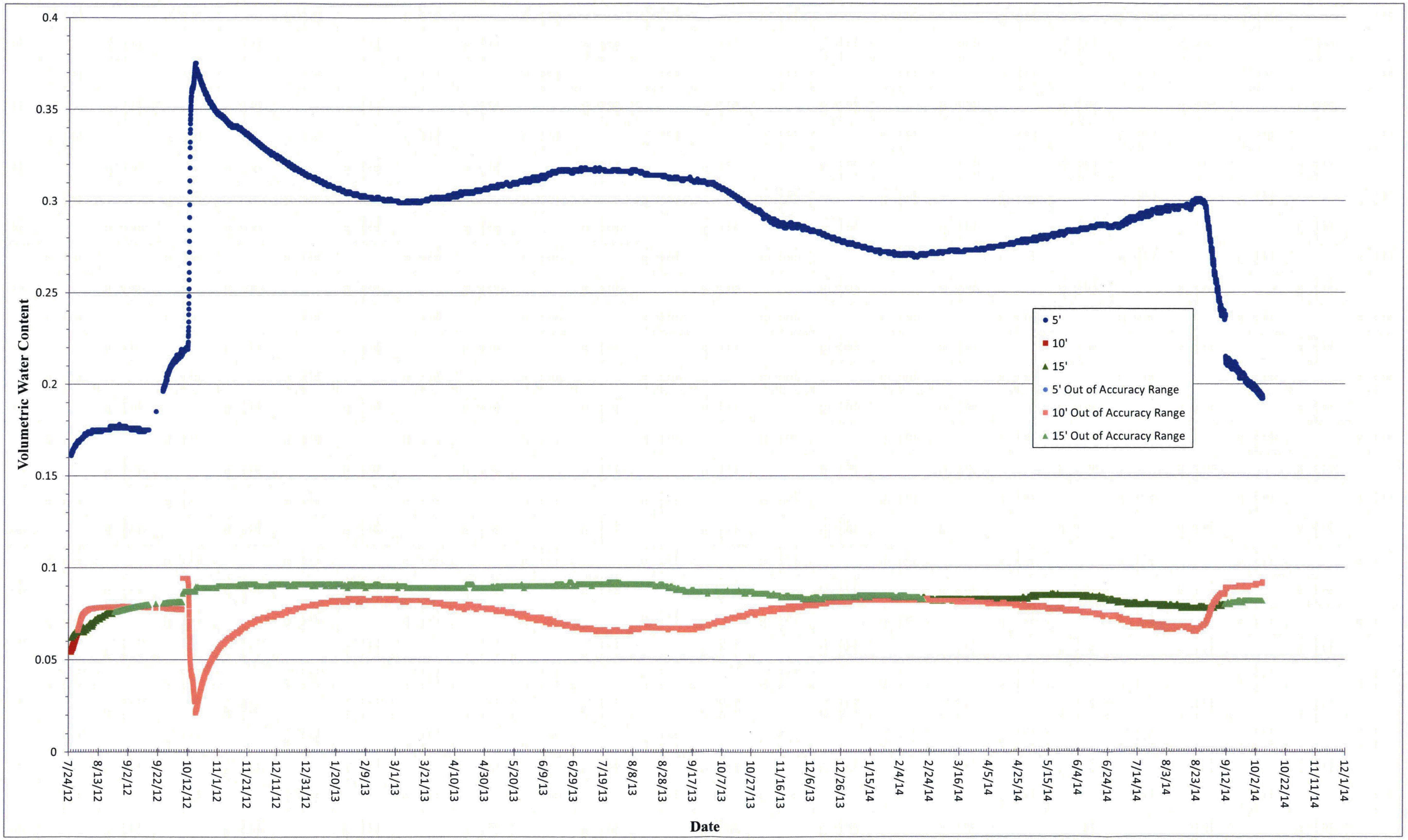

Figure A.4-1. Volumetric Water Content, Section 34 Flood Area

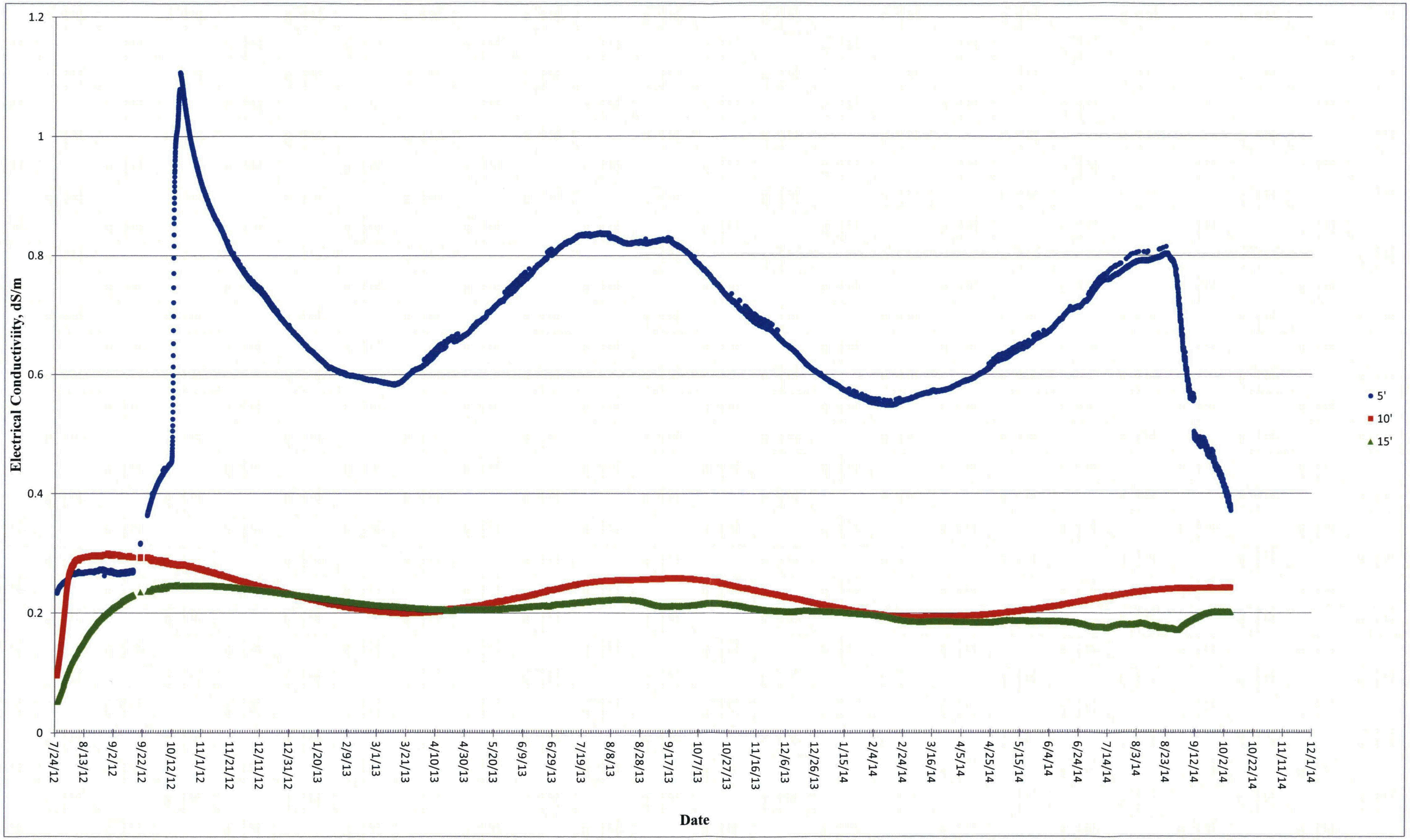

Figure A.4-2. Electrical Conductivity, Section 34 Flood Area

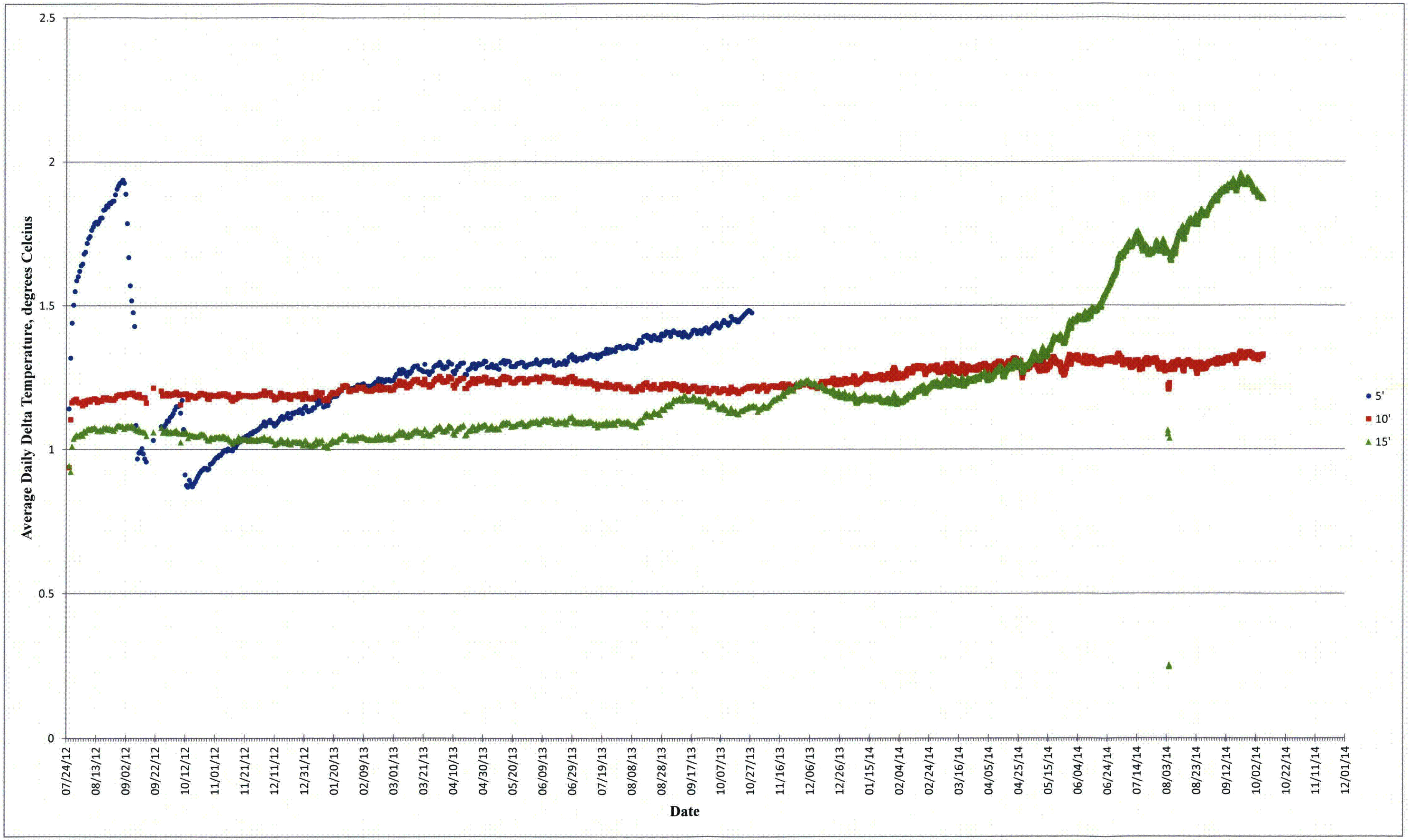

Figure A.4-3. Average Daily Delta Temperature, Section 34 Flood Area

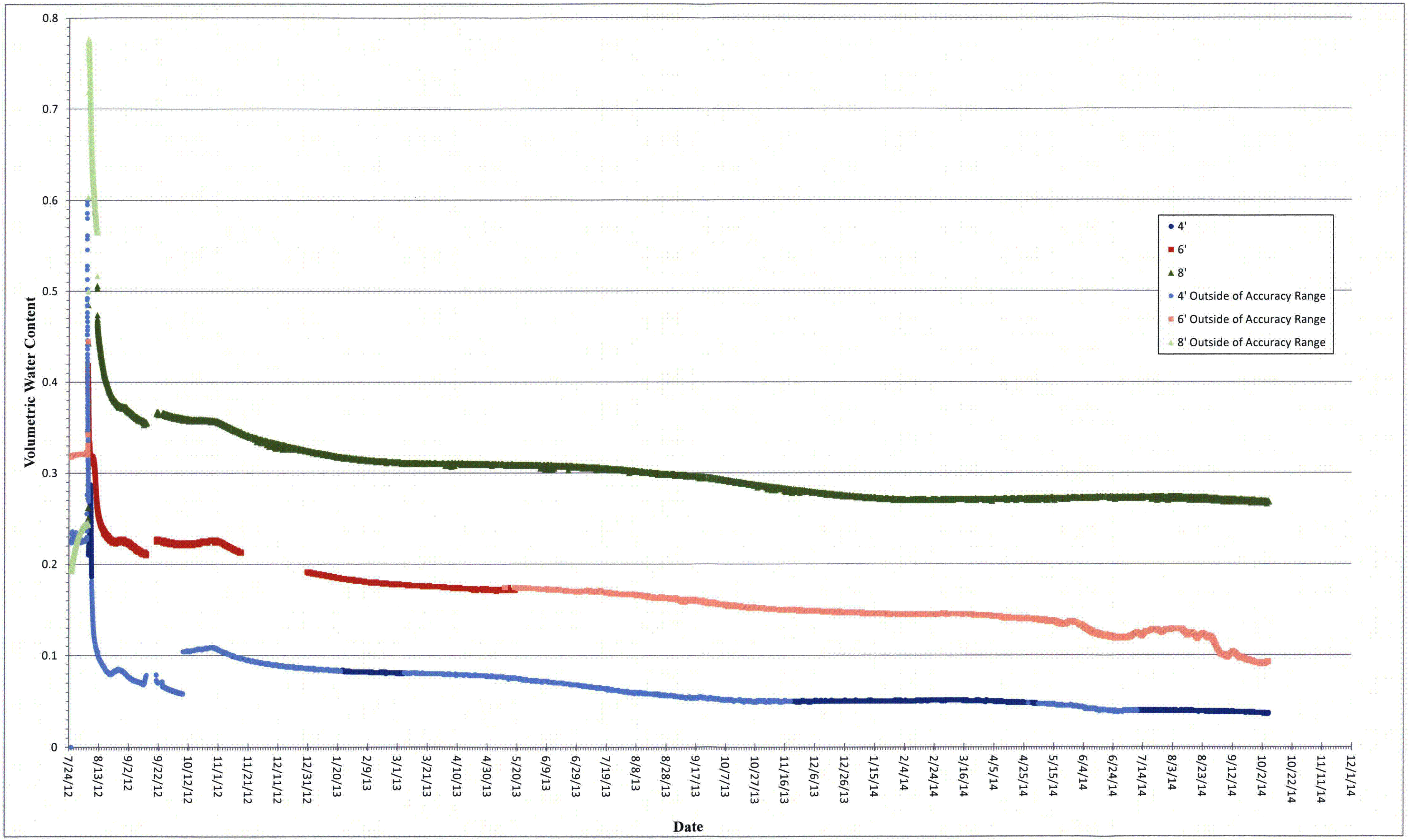

Figure A.4-4. Volumetric Water Content, Section 28 Center Pivot

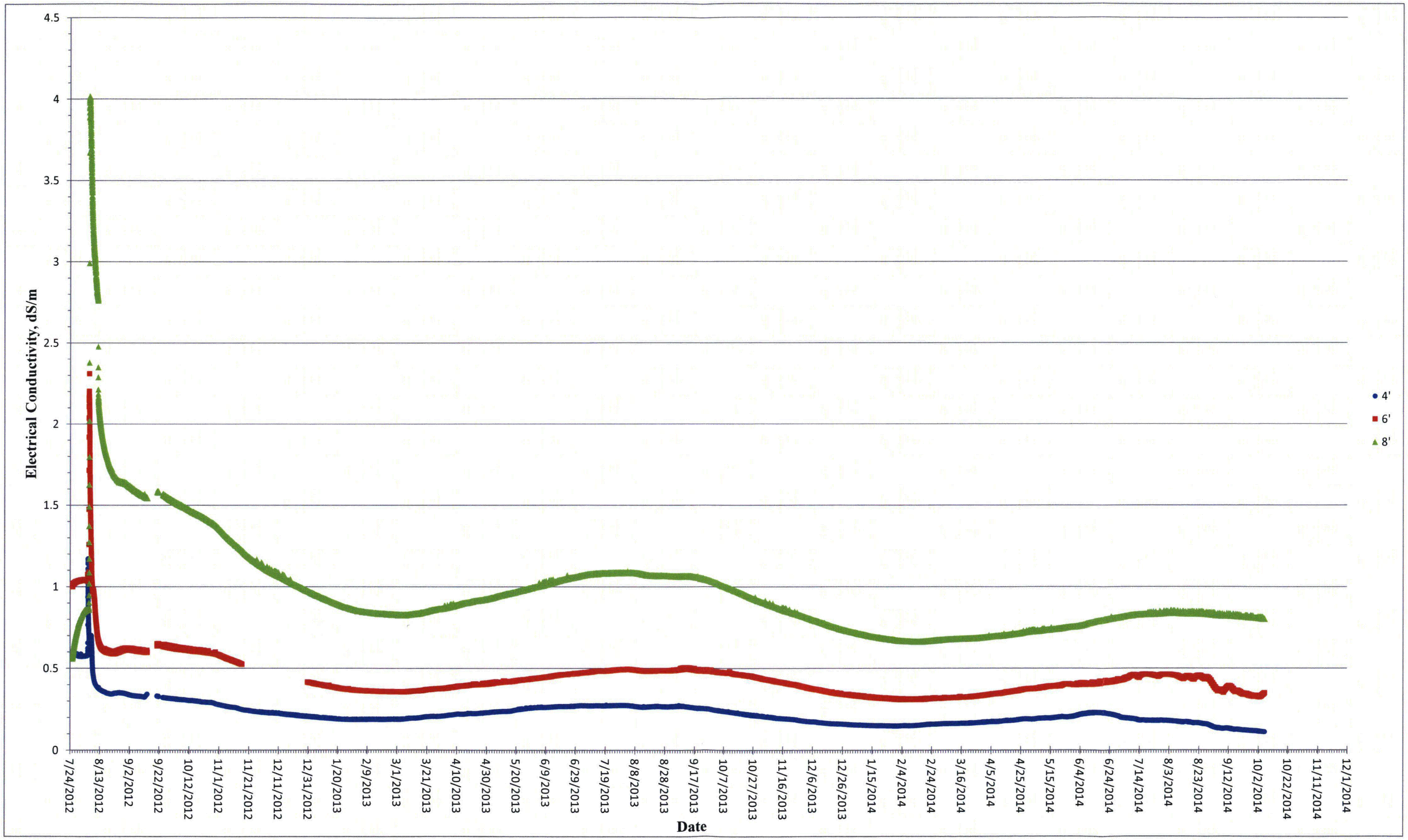

Figure A.4-5. Electrical Conductivity, Section 28 Center Pivot

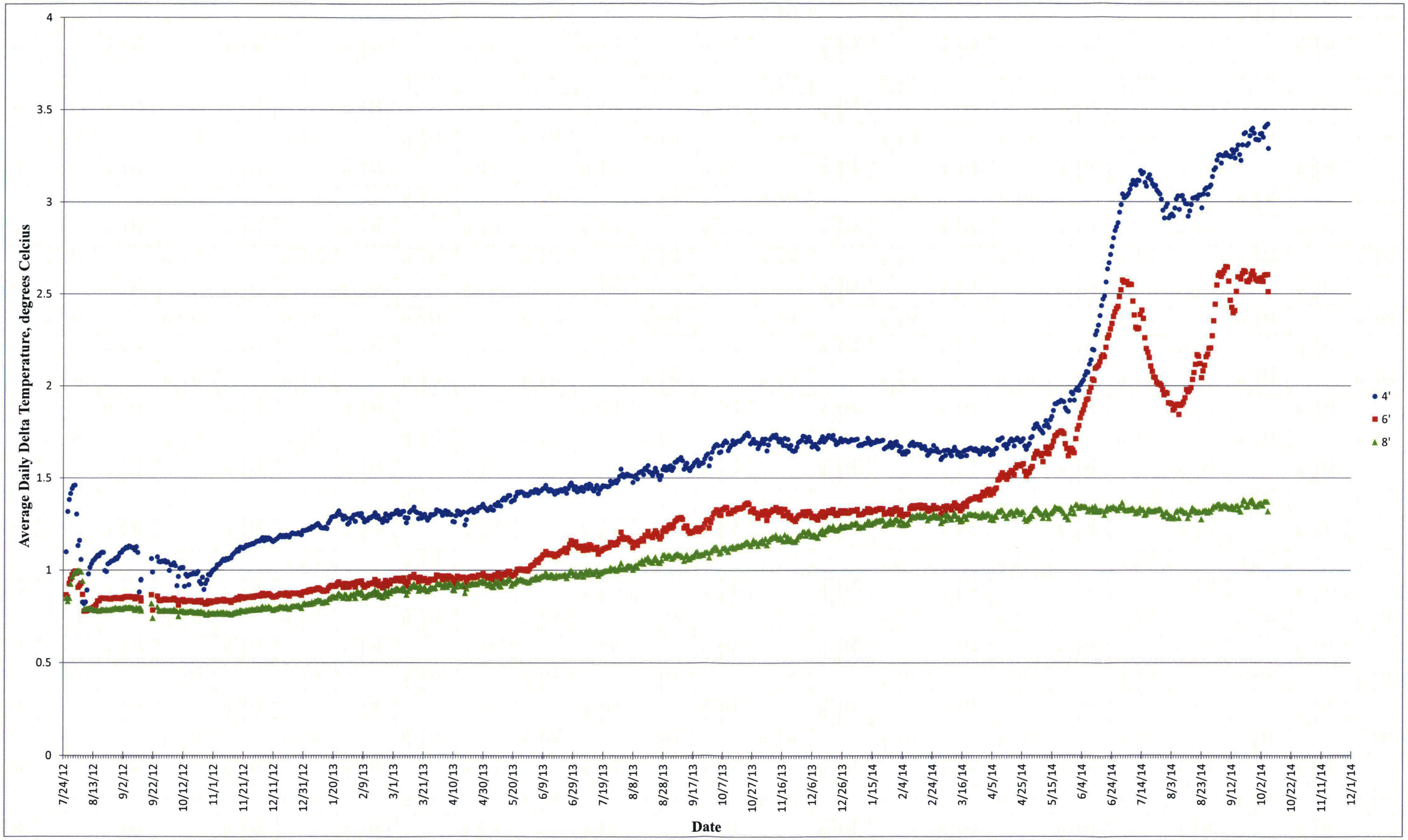

Figure A.4-6. Average Daily Delta Temperature, Section 28 Center Pivot