ERM

Geosyntec consultants

APPENDIX D

EPA COMMENTS ON THE MAY 27, 2016 VERSION OF THE 2015 ANNUAL PERFORMANCE EVALUATION REPORT AND CRs RESPONSES TO EPA COMMENTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

SENT VIA EMAIL AS PDF

November 15, 2016

Scott Goulart
Aerojet Rocketdyne, Inc
11260 Pyrites Way, Suite 125
Rancho Cordova, CA 95670

Subject: EPA Comments on the 2015 Annual Performance Evaluation Report
Baldwin Park Operable Unit, San Gabriel Valley Area 2 Superfund Site

Dear Mr. Goulart:

We have completed our review of the 2015 Annual Performance Evaluation Report for the Baldwin Park Operable Unit (BPOU) of the San Gabriel Valley Area 2 Superfund Site. The document is dated May 27, 2016, and was prepared by Geosyntec Consultants and ERM on behalf of the BPOU Cooperating Respondents (CRs). CR representatives provided supplemental information to EPA in August and October 2016. The submittals satisfy requirements in Unilateral Administrative Order (UAO) 2000-13 issued by EPA on June 30, 2000 and amended on February 28, 2002.

Our comments are included as an enclosure to this letter. We request that you provide, by December 16, 2016, responses to EPA's comments and a revised version of the 2015 report that incorporates the supplemental information provided in August and October 2016 and changes needed to respond to our comments.

Please call or email with any questions.

Sincerely,

Wayne Praskins
EPA Project Manager

Enclosure

cc: Steve Johnson, Stetson Engineers
Tony Zampiello, Main San Gabriel Basin Watermaster
Sue Fears, California Department of Toxic Substances Control

EPA Comments on "2015 Annual Performance Evaluation Report, Baldwin Park Operable Unit of the San Gabriel Valley Superfund Sites, Los Angeles County, California"
Prepared by Geosyntec Consultants and ERM
(Report dated May 27, 2016; Supplemental information provided in August and October 2016; EPA comments dated November 15, 2016)

No.	Location	Comment
#1.	Pg. 26, Section 3.3.2	There is a typo in the last sentence in the referenced figure.
#2.	Pgs. 31-35, Section 4	It appears, based on a review of sampling and analytical requirements summarized in Table 3-2 and the 1,2,3-trichloropropane (1,2,3-TCP) sampling results provided in Table 5-2, that samples were not analyzed at the reporting limit (RL) required by the Performance Standards Evaluation Plan (PSEP) (0.005 ug/L) from a number of wells. LPVCWD 5 – PSEP requires annual sampling, but no results with appropriate RL shown. VCWD SA1-3 – PSEP requires quarterly sampling, but there is no 4th Quarter result with appropriate RL shown. SGVWC B25A – PSEP requires quarterly sampling, but there is no 4th Quarter result with appropriate RL shown. SGVWC B26A – PSEP requires quarterly sampling, but there is no 3rd Quarter result with appropriate RL shown. SGVWC B26B – PSEP requires quarterly sampling, but there are no 1st and 2nd Quarter results with appropriate RL shown. MW5-3 ports 2, 3, 4, 6, 8, 9 – PSEP requires annual sampling, but no results with appropriate RL shown. MW5-11 port 1 – PSEP requires annual sampling, but no results with appropriate RL shown. MW5-18 port 1 - PSEP requires annual sampling, but no results with appropriate RL shown. MW5-22 ports 4, 5 - PSEP requires annual sampling, but no results with appropriate RL shown. In addition, we are unclear if samples should have been analyzed for 1,2,3-TCP from 5-13 and 5-17. Table 3-2 indicates that samples should be analyzed biennially, but does not indicate in which year samples should be collected.
#3.	Pgs. 38-39, Section 5.2.1 (and Table 5-2)	The ALR-3 well was the only ALR monitoring well with 1,2,3-TCP above the California Notification Level (NL) and has the highest concentrations of most of the Chemicals of Concern (COCs) among the ALR wells. We request that it be included as a PSEP monitoring well.
#4.	Pgs. 38-39, Section 5.2.1	It appears, based on a review of sampling and analytical requirements summarized in Table 3-2 and the ethylene dibromide (EDB) sampling results

		provided on August 30, 2016, that a sample should have been collected and analyzed from MW 5-11 port 3. In addition, we are unclear if samples should have been analyzed for EDB from MW5-13 port 3 and MW 5-17 port 3. Table 3-2 indicates that samples should be analyzed biennially, but does not indicate in which year samples should be collected.
#5.	Pgs. 39-40, Bullets	There are several instances in which results are qualified as non-detect because of field blank contamination. This is a concern, particularly considering that most locations are only sampled annually. Please propose a process by which locations where data quality objectives are not satisfied due to elevated detection limits or other data quality issues are resampled in the same calendar year. Also, please provide additional information on steps taken by the sampling teams to reduce the likelihood of field blank contamination.
#6.	Pgs. 47-48, Section 5.4.2	The annual report includes a set of figures (Figures 5-24 through 5-29) depicting forward particle tracking results for the five year period ending June 30, 2015. In August, we noted that the 2015 results differed significantly from 2014 results, prompting further CR review and the conclusion that certain "mass balance" errors in the groundwater model affected the May 2016 particle tracking results. Revised figures (Figures 5-24R through 5-29R) were provided to EPA in October 2016. Please include the new figures in a revised version of the 2015 report along with a discussion of the modeling issues that affected the May 2016 results, the changes made to generate the October 2016 results, and modeling issues that still need to be resolved. We note that the revised Figure 5-24R shows particle tracks that originate in some of the BPOU source areas moving to the west of the apparent SA1-1 and 1-3 capture zone. We suspect that this result is due to a combination of factors, including a failure to achieve the EPA-targeted pumping rates at the SA1-1 and 1-3 wells during the simulation period and reduced recharge at the Santa Fe Spreading Grounds associated with drought conditions. We expect that the improvements to the Subarea 1 treatment system that are nearing completion will allow higher extraction and treatment rates, improving capture. In 2017 or 2018, we expect further improvement to capture after groundwater extraction capacity at the VCWD Lante Treatment Plant site is increased and the approved EPA extraction rates (5,000 gpm at the SA1-3 location and 1,000 gpm at SA1-1) can be achieved. In the interim period before groundwater extraction capacity at the VCWD Lante Treatment Plant site is increased, we believe there is benefit in increasing pumping at the SA1-1 location above the EPA-approved rate of 1,000 gpm. While not ideally located,

		additional pumping at SA1-1 should improve Subarea 1 capture of the targeted area of groundwater contamination.
#7.	Pgs. 50-52, Section 6.2	As shown in Table 2-1, Table 6-6, and relevant figures in Appendix B, virtually all of the pumping in 2015 at the LPVCWD subproject was at LPVCWD Well #5 but COC concentrations at LPVCWD Well #2 have been consistently higher than at LPVCWD #5. We request that the CRs work with LPVCWD to identify actions that can be taken to increase pumping at LPVCWD #2 and to determine the rate at which the well can be continuously pumped. We understand that the well cannot be operated at its capacity due to sanding problems but that it may be sustainably operated at a lower rate.
#8.	Pg. 65, last paragraph	The text states that despite the different methodologies used to estimate total dissolved COC mass in 2014 and 2015, the results appear to be "generally consistent." We do not agree. As shown in Table 7-3 and Figure 7-19, the estimated mass dropped by more than half between 2014 and 2015. The supplemental response provided on August 30, 2016 describes changes made in the methodology in 2015 and commits to evaluate the effect of the change in methodology by performing a side-by-side comparison of the two methods in the 2016 Annual Report. If the evaluation confirms that the change in methodology has a notable effect on the mass estimates, future reports should note that post-2014 estimates may not be comparable to earlier estimates.
#9.	Pgs. 66-67, Section 7.1.4	Figure 5-27 (and Figure 5-27R) show a number of particle tracks captured by the City of Industry 5 (COI 5) well and that the well is located within the normalized COC plume boundary. The supplemental response provided in August 2016 indicates that the statement indicating that no particle tracks are captured by the COI 5 extraction well because the well is not located within the interpreted extent of the total normalized COC plume is incorrect.
#10.	Pg. 70, 1st paragraph (and Figures 5-24 and 5-25).	Although project extraction does limit migration of COCs and remove chemical mass, the reduced pumping rates in Subarea 1 did not provide adequate hydraulic control in 2015 consistent with EPA's remedial objectives
#11.	Table 3-2	The PSEP does not currently require any monitoring at the Cal Domestic subproject other than annual monitoring of CDWC 03. For each of the Cal Domestic production wells, please propose a minimum monitoring frequency for the chemicals of concern, including 1,4-dioxane, which has been detected upgradient of the Cal Domestic wellfield (e.g., at 7.4 ug/L at MW 5-05).
#12.	Fig. 5-18	Groundwater elevations in the figure are incorrectly shown as a date rather than an elevation.
#13.	App. B, Fig. B-14	The figure indicates that TCE was non-detect throughout 2015. The supplemental response provided in August 2016 provides a corrected figure showing TCE detections observed in the LPVCWD extraction wells in 2015.

#14.	App B	The figures providing concentration-time graphs for California Domestic Water Co are mis-titled (should be B- not 6-). Also, the Cal Domestic figures are not included in the list of figures at the beginning of the appendix and the figure titles indicate raw and treated results but only raw data appear to be provided.

Response to EPA Comments on "2015 Annual Performance Evaluation Report, Baldwin Park Operable Unit, San Gabriel Valley Area Sites, Los Angeles County, California" Prepared by Geosyntec Consultants and ERM (Report dated May 27, 2016; EPA comments received via e-mail dated November 15, 2016)

The BPOU Cooperating Respondents (CRs) have prepared the following responses to EPA's comments on the 2015 Annual Performance Evaluation Report dated May 27, 2016. EPA comments were provided with a letter an e-mail dated November 15, 2016. Responses to EPA comments are repeated below and are followed by CR responses shown in bold italicized font. EPA provided "initial" comments on the subject report in an e-mail dated August 11, 2016. The CRs provided responses and supplemental information in relation to these comments on August 30 and October 19, 2016 as referenced below.

1.	Pg. 26, Section 3.3.2	There is a typo in the last sentence in the referenced figure. **Response:** **Comment acknowledged. The typo has been corrected in the revised report.**
2.	Pgs. 31-35, Section 4	It appears, based on a review of sampling and analytical requirements summarized in Table 3-2 and the 1,2,3-trichloropropane (1,2,3-TCP) sampling results provided in Table 5-2, that samples were not analyzed at the reporting limit (RL) required by the Performance Standards Evaluation Plan (PSEP) (0.005 ug/L) from a number of wells. LPVCWD 5 – PSEP requires annual sampling, but no results with appropriate RL shown. VCWD SA1-3 – PSEP requires quarterly sampling, but there is no 4th Quarter result with appropriate RL shown. SGVWC B25A – PSEP requires quarterly sampling, but there is no 4th Quarter result with appropriate RL shown. SGVWC B26A – PSEP requires quarterly sampling, but there is no 3rd Quarter result with appropriate RL shown. SGVWC B26B – PSEP requires quarterly sampling, but there are no 1st and 2nd Quarter results with appropriate RL shown. MW5-3 ports 2, 3, 4, 6, 8, 9 – PSEP requires annual sampling, but no results with appropriate RL shown. MW5-11 port 1 – PSEP requires annual sampling, but no results with appropriate RL shown. MW5-18 port 1 - PSEP requires annual sampling, but no results with appropriate RL shown. MW5-22 ports 4, 5 - PSEP requires annual sampling, but no results with appropriate RL shown. In addition, we are unclear if samples should have been analyzed for 1,2,3-TCP from 5-13 and 5-17. Table 3-2 indicates that samples should be analyzed biennially, but does not indicate in which year samples should be collected.

		Response: **As described in the Performance Standards Evaluation Plan (PSEP), PSEP-required monitoring for 1,2,3-trichloropropane (1,2,3-TCP) in project extraction wells are to be satisfied by Division of Drinking Water (DDW) operating permit monitoring requirements. Table 4-2 from the Performance Standards Evaluation Plan (PSEP) was recently reviewed by Stetson Engineers and subsequently updated to reflect current DDW operating permit requirements. These updates include the addition of projected dates for biennial sampling at select upgradient surveillance monitoring locations and have been incorporated into a revised version of Table 3-2 in the revised report.** **In response to EPA's specific comments regarding various the omission of low-level reporting limits for various extraction and monitoring wells, the project database maintained by Laboratory Data Consultants was re-queried to investigate the missing low-level RL sampling results for 1,2,3-TCP. This investigation indicated that the previous database query used to produce Table 5-2 did not capture all of the sampling results that utilized the low-level analytical method (RL = 0.005 µg/L). As a result, Table 5-2 in the revised report has been updated to include all available 1,2,3-TCP data for 2015. The updated Table 5-2 addresses all of the missing low-level 1,2,3-TCP sampling results noted by EPA with the exception of the LPVCWD 5 well. For this well, we understand that the DDW operating permit does not require the use of a low-level analytical method for the analysis of 1,2,3-TCP. Consequently, laboratory results from EPA Method 524.2 are presented with a reporting limit of 0.5 µg/L.** **Given the lack of detectable concentrations of 1,2,3-TCP in Subarea 3 monitoring and extraction wells, we recommend that PSEP-requirement for the reporting of 1,2,3-TCP results be reduced from quarterly to annual for wells in Subarea 3 for the purpose of annual reporting regardless of the frequency of monitoring required by the DDW operating permits.**
3.	Pgs. 38-39, Section 5.2.1 (and Table 5-2)	The ALR-3 well was the only ALR monitoring well with 1,2,3-TCP above the California Notification Level (NL) and has the highest concentrations of most of the Chemicals of Concern (COCs) among the ALR wells. We request that it be included as a PSEP monitoring well. **Response:** **Comment acknowledged. The ALR-3 well has been added to the PSEP sampling requirements in Table 3-2 and the sampling results from this well will continue to be reported in future Annual Reports.**

4.	Pgs. 38-39, Section 5.2.1	It appears, based on a review of sampling and analytical requirements summarized in Table 3-2 and the ethylene dibromide (EDB) sampling results provided on August 30, 2016, that a sample should have been collected and analyzed from MW 5-11 port 3. In addition, we are unclear if samples should have been analyzed for EDB from MW5-13 port 3 and MW 5-17 port 3. Table 3-2 indicates that samples should be analyzed biennially, but does not indicate in which year samples should be collected. **Response:** **Upgradient surveillance samples could not be collected in the uppermost port of MW 5-11 (Port 3) in 2015 because the sampling port was dry due to low water-level conditions. Similar to MW5-11, upgradient surveillance samples could not be collected from the uppermost port (Port 3) in MW5-13 and MW5-17 because the sampling ports were dry due to low water-level conditions.** **As indicated in the response to Comment No. 2 above, the CRs have revised Table 3-2 in the revised report to include the projected dates for biennial sampling. Biennial sampling of MW5-13 and MW5-17 was performed in 2015 and are next scheduled for sampling in 2017.**
5.	Pgs. 39-40, Bullets	There are several instances in which results are qualified as non-detect because of field blank contamination. This is a concern, particularly considering that most locations are only sampled annually. Please propose a process by which locations where data quality objectives are not satisfied due to elevated detection limits or other data quality issues are resampled in the same calendar year. Also, please provide additional information on steps taken by the sampling teams to reduce the likelihood of field blank contamination. **Response:** **Please refer to the attached memorandum prepared by Laboratory Data Consultants dated November 11, 2016 describing a comprehensive review of 2015 BPOU analytical data qualified due to blank contamination during the Tier 1A/1B and Tier 3 validation processes. The memorandum includes proposed corrective actions to address the issues identified from this review.**
6.	Pgs. 47-48, Section 5.4.2	The annual report includes a set of figures (Figures 5-24 through 5-29) depicting forward particle tracking results for the five year period ending June 30, 2015. In August, we noted that the 2015 results differed significantly from 2014 results, prompting further CR review and the conclusion that certain "mass balance" errors in the groundwater model affected the May 2016 particle tracking results. Revised figures (Figures

5-24R through 5-29R) were provided to EPA in October 2016. Please include the new figures in a revised version of the 2015 report along with a discussion of the modeling issues that affected the May 2016 results, the changes made to generate the October 2016 results, and modeling issues that still need to be resolved.

We note that the revised Figure 5-24R shows particle tracks that originate in some of the BPOU source areas moving to the west of the apparent SA1-1 and 1-3 capture zone. We suspect that this result is due to a combination of factors, including a failure to achieve the EPA-targeted pumping rates at the SA1-1 and 1-3 wells during the simulation period and reduced recharge at the Santa Fe Spreading Grounds associated with drought conditions.

We expect that the improvements to the Subarea 1 treatment system that are nearing completion will allow higher extraction and treatment rates, improving capture. In 2017 or 2018, we expect further improvement to capture after groundwater extraction capacity at the VCWD Lante Treatment Plant site is increased and the approved EPA extraction rates (5,000 gpm at the SA1-3 location and 1,000 gpm at SA1-1) can be achieved. In the interim period before groundwater extraction capacity at the VCWD Lante Treatment Plant site is increased, we believe there is benefit in increasing pumping at the SA1-1 location above the EPA-approved rate of 1,000 gpm. While not ideally located, additional pumping at SA1-1 should improve Subarea 1 capture of the targeted area of groundwater contamination.

Response:
Figures 5-24 through 5-29 in the attached revised report have been replaced to incorporate those figures provided with our October 19, 2016 additional information submittal. The text of the revised report has also been revised to include a discussion of the numerical stability issues associated with the multiple layer extraction wells and ongoing efforts to address this issue. The CRs are continuing efforts to increase groundwater extraction at the Lante treatment plant site and will perform additional modeling analyses of the potential benefits of increasing groundwater extraction at the SA1-1 site in the interim period. The results of the additional modeling analyses for the SA1-1 well will be included in the 2016 annual performance evaluation report. We recommend that groundwater extraction from the SA1-3 (Lante) well be maximized using existing pumping equipment prior to increasing pumping from the SA1-1 well. This is because chemical mass removal rates are much higher from the SA1-3 (Lante) well in comparison to the SA1-1 well.

7.	Pgs. 50-52, Section 6.2	As shown in Table 2-1, Table 6-6, and relevant figures in Appendix B, virtually all of the pumping in 2015 at the LPVCWD subproject was at LPVCWD Well #5 but COC concentrations at LPVCWD Well #2 have been consistently higher than at LPVCWD #5. We request that the CRs work with LPVCWD to identify actions that can be taken to increase pumping at LPVCWD #2 and to determine the rate at which the well can be continuously pumped. We understand that the well cannot be operated at its capacity due to sanding problems but that it may be sustainably operated at a lower rate. **Response:** **The CRs will consult with LPVCWD regarding the potential to operate LPVCWD Well #2 in combination with LPVCWD #5 and report our findings to EPA under separate cover.**
8.	Pg. 65, last paragraph	The text states that despite the different methodologies used to estimate total dissolved COC mass in 2014 and 2015, the results appear to be "generally consistent." We do not agree. As shown in Table 7-3 and Figure 7-19, the estimated mass dropped by more than half between 2014 and 2015. The supplemental response provided on August 30, 2016 describes changes made in the methodology in 2015 and commits to evaluate the effect of the change in methodology by performing a side-by-side comparison of the two methods in the 2016 Annual Report. If the evaluation confirms that the change in methodology has a notable effect on the mass estimates, future reports should note that post-2014 estimates may not be comparable to earlier estimates. **Response:** **The text states indicates that *"Despite the different methodologies for calculating plume mass estimates, the results appear to be generally consistent and continue to illustrate a decreasing trend in COC mass dissolved in groundwater"*. The term "generally consistent" refers to the decreasing trend in COC mass despite the use of different estimation methodologies. Consistent with our August 30, 2016 supplemental response, the CRs will evaluate the effect of the change in methods by performing a side-by-side comparison of the two methods in the 2016 Annual Report.**
9.	Pgs. 66-67, Section 7.1.4	Figure 5-27 (and Figure 5-27R) show a number of particle tracks captured by the City of Industry 5 (COI 5) well and that the well is located within the normalized COC plume boundary. The supplemental response provided in August 2016 indicates that the statement indicating that no particle tracks are captured by the COI 5 extraction well because the well is not located within the interpreted extent of the total normalized COC plume is incorrect.

		Response: **Comment acknowledged. The text in revised report was revised to correct this statement.**
10.	Pg. 70, 1st paragraph (and Figures 5-24 and 5-25).	Although project extraction does limit migration of COCs and remove chemical mass, the reduced pumping rates in Subarea 1 did not provide adequate hydraulic control in 2015 consistent with EPA's remedial objectives. **Response:** **As described in previous correspondence, the CRs believe that the performance standards outlined in the PSEP are appropriate for assessing remedy performance. As stated in Section 1.3.3 of the report, these performance standards consist of: 1) limiting further migration of COCs in groundwater, and 2) the removal of COCs from groundwater. Although hydraulic control in Subarea 1 was somewhat reduced in 2015 due to reduced pumping rates, COC mass removal rates for the Subarea 1 extraction system remained significant resulting in the removal of more than 500 pounds of chemical mass in 2015.**
11.	Table 3-2	The PSEP does not currently require any monitoring at the Cal Domestic subproject other than annual monitoring of CDWC 03. For each of the Cal Domestic production wells, please propose a minimum monitoring frequency for the chemicals of concern, including 1,4-dioxane, which has been detected upgradient of the Cal Domestic wellfield (e.g., at 7.4 ug/L at MW 5-05). **Response:** **It is recommended that the PSEP be modified to include an annual reporting frequency for select VOCs (1,2-dichloroethane, carbon tetrachloride, tetrachloroethene, and trichloroethene), perchlorate, NDMA, and 1,4-dioxane for operational CDWC wells. This annual reporting requirement will be satisfied by existing DDW monitoring requirements with the exception of 1,4-dioxane which will be added to the analyte list for the operational CDWC wells at least once each year. Low-level analyses for 1,2,3-TCP are not considered necessary due to the absence of 1,2,3-TCP in Subarea 3 monitoring and extraction wells. Table 3-2 in the revised report has been updated accordingly.**
12.	Fig. 5-18	Groundwater elevations in the figure are incorrectly shown as a date rather than an elevation. **Response:** **Comment acknowledged. Figure 5-18 has been revised and replaced in the revised report.**

13.	App. B, Fig. B-14	The figure indicates that TCE was non-detect throughout 2015. The supplemental response provided in August 2016 provides a corrected figure showing TCE detections observed in the LPVCWD extraction wells in 2015. **Response:** **Comment acknowledged. Figure B-14 has been revised as provided with our August 16 supplemental response and replaced in the revised report.**
14.	App. B	The figures providing concentration-time graphs for California Domestic Water Co are mis-titled (should be B- not 6-). Also, the Cal Domestic figures are not included in the list of figures at the beginning of the appendix and the figure titles indicate raw and treated results but only raw data appear to be provided. **Response:** **Comment acknowledged. Figures 6-29 – 6-35 have been renumbered to Figures B-29 – B-35 and replaced in the revised report.**

Response to EPA "Initial" Comments on "2015 Annual Performance Evaluation Report, Baldwin Park Operable Unit, San Gabriel Valley Area Sites, Los Angeles County, California" Prepared by Geosyntec Consultants and ERM (Report dated May 27, 2016; EPA comments received via e-mail dated August 11, 2016)

The BPOU Cooperating Respondents (CRs) have prepared the following responses to EPA's "initial" comments on the 2015 Annual Performance Evaluation Report dated May 27, 2016. EPA comments were provided in an e-mail dated August 11, 2016. Responses to EPA comments are repeated below and are followed by CR responses shown in bold italicized font.

1.	Section 5.2.1	The report states that "Detections of non-COC organic compounds, including EDB, for all available 2015 sampling results are presented in Table 5-3." Please list the wells and zones tested for EDB in 2015, the analytical reporting limit, and confirm that the absence of EDB from the table indicates that it was not detected in any samples. **Response:** **Results for 2015 groundwater samples analyzed for ethylene dibromide (EDB)(also known as 1,2-dibromoethane) including a listing of wells and screened intervals sampled and associated laboratory reporting and detection limits are shown on the attached table. Although EDB results are reported relative to the laboratory reporting limit of 0.02 µg/L, sample results are qualified as "estimated" if EDB was detected at a concentration below the LDR but greater than the detection limit of 0.0054 µg/L. Consequently, the absence of "J-flagged" or "estimated" sample results in the attached table indicates that EDB was not detected at a concentration greater than 0.0054 µg/L in any of the samples analyzed for EDB.**
2.	Section 7.1.3.2	The report provides estimates of the dissolved-phase contaminant mass in groundwater at the site. The estimated mass dropped by more than 50% from 2014 to 2015, but changes in the extent and levels of contamination from 2014 to 2015 do not appear to explain the 50% decrease. Please comment on possible causes of this significant reduction in the estimated mass. To what extent do you think the change from 2014 to 2015 is the result in a change in software (from Earth Vision to EVS) or modeling assumptions? **Response:** **The mass estimation in 2014 and prior years was calculated by estimating the volume of each isoshell using the EarthVision software and then multiplied by a uniform COC concentration and porosity to estimate the amount of mass in each isoshell. The estimated COC mass for all of the isoshells representing the plume geometry was subsequently summed together to provide an estimate of the total COC mass in the plume. In this method, while the 3D interpolation of the isoshell volumes is**

		considered to be of relatively high resolution and accuracy, the assignment of a single uniform COC concentration to each isoshell introduces some uncertainty in the mass estimates. **The mass estimation for the 2015 COC plumes presented in the 2015 Annual Report was performed using the same resolution as the interpolation of the plume concentrations computed in EVS. In this method, EVS was used to perform 3D interpolations of the COC concentrations. EVS then uses volumetric mass calculations in all the individual model cells with their own unique interpolated concentration, area, and thickness to estimate the total COC mass in the plume. Therefore, it is our opinion that the difference between the mass estimates presented for 2015 and prior years is in part related to the difference in the mass calculation methodology and respective resolution of the interpolation of the COC concentrations within the COC plumes. Other differences in the mass estimates from 2014 and 2015 can be attributed to changes in COC concentrations and the geometry of the COC plumes. To confirm this conclusion and quantify potential differences between the methods used for the plume mass estimates, we will perform a side-by-side comparison of the two methods using the 2014 dataset and present the results in the 2016 Annual Report.** **Despite the differences between the mass estimation methodologies, it is important to note that the methodology used for mass estimates from 2004 through 2014 presented in the 2015 Annual Report was consistent for each year within this 11-year time period. As a result, the mass estimates for this period can be compared to one another and were used to demonstrate a decreasing trend in COC mass dissolved in groundwater within the BPOU as described in the 2015 Annual Report.**
3.	Section 7.1.4	The report states that "Consistent with previous years, operation of the COI 5 extraction well provided little benefit relative to hydraulic control or chemical mass removal. No particle tracks are captured by COI 5 extraction well because the well is not located within the interpreted extent of the total normalized COC plume described in Section 5.0 above..." Figure 5-27 shows a number of particle tracks captured by the COI 5 well and that the well is located within the normalized COC plume boundary. Please comment. **Response:** **The statement indicating that no particle tracks are captured by the COI 5 extraction well because the well is not located within the interpreted extent of the total normalized COC plume is incorrect. This statement is a remnant from the 2014 Annual Report when a different methodology was used to assign starting particle locations for particle tracking simulations. As described in Section 3.3.4 of the 2015 Annual Report, the starting locations for the particles were distributed uniformly within**

		the lateral and vertical extent of the total normalized COC plume rather than at the model nodal locations as done in the Addendum to 2014 Annual Performance Evaluation Report. **Despite the change to the distribution of starting particle locations in the groundwater model, we maintain that the COI 5 extraction well provides little benefit relative to hydraulic control or chemical mass removal when compared to other project extraction wells. As described in Section 7.1.4 of the report, there is uncertainty regarding the source of COCs observed in the COI 5 well and the relationship of these COCs to the BPOU plume given the occurrence and absence of some BPOU-related COCs at this location. As shown on Figure 5-27, the COI 5 well is interpreted to be located on the periphery of the total normalized COC plume at the southern terminus of the total normalized COC contour of 1 (unitless) in the depth interval extending from -200 to -500 feet msl. As a result, the lateral and vertical extent of COC concentrations exceeding MCLs or NLs in the vicinity of the COI 5 well appears to be limited. As shown in the particle tracking results, the extent of hydraulic capture provided by the COI 5 well is very localized. Given this localized hydraulic capture and low COC concentrations of localized extent, the benefit of continued groundwater extraction is questionable. Further, COC mass removal from the COI 5 well was only 22.8 kilograms (kgs) in 2015 whereas the total COC mass removed by BPOU project extraction wells was approximately 2,473 kgs. Consequently, COC mass removal by the COI 5 well in 2015 was less than 1% of the total COC mass removed by BPOU project extraction wells in 2015.**
4.	Table 5-2	Many of the 1,2,3-TCP results for PSEP-required wells are reported as "<0.5 ug/L. Was the PSEP-required reporting limit of 0.005 ug/L achieved in samples required by the PSEP and QAPP? **Response:** **The detection limit reported for 1,2,3-trichloropropane (1,2,3-TCP) groundwater samples collected in the BPOU varies depending on the analytical method selected by the Water Entities. Samples are submitted for laboratory analysis for 1,2,3-TCP by either: 1) the standard EPA Method 524.2 for VOCs, which has a reporting limit of 500 ng/L (0.5 µg/L) or 2) the modified (low-level) EPA Method 524.2, developed by the Sanitation and Radiation Laboratories (SRL), which provides a reporting limit of 5 ng/L (0.005 µg/L). As shown in Table 5-2, some samples are submitted for analysis by both the standard EPA Method 524.2 and the modified low-level SRL modified Method 524.2.**
5.	Table 5-4	There are numerous rows with an analyte name of “Tentatively Identified Compounds,” an analyte ID of “TIC-ND,” and a result of “0”. Please explain these entries.

		Response: **Table 5-4 presents laboratory results for groundwater samples that were both detect and non-detect for tentatively identified compounds results. Those sample results designated with an analyte name of "Tentatively Identified Compounds," an analyte ID of "TIC-ND," and a result of "0" indicates that the sample was analyzed for TICs but no TICs were detected. A footnote will added to future versions of this table to explain these sample results.**
6.	Figures 5-24 and 25	The figures show particle tracks reaching SA1-3 originating mostly behind Santa Fe Dam. These particle tracks differ significantly from those shown in the 2014 report for SA1-3. Also, the similar widths of the capture zones for SA1-1 and SA1-3 are surprising given the higher pumping rates at SA1-3 over the last several years (twice the pumping in 2015; five times in 2014; three times in 2013). Please confirm that the particle tracks shown in the figures were correctly generated and presented, and represent the conditions described in the text and figure (e.g., actual pumping rates, transient flow field from 2010/11 to 2014/15). **Response:** **We have confirmed that the particle tracks shown in Figures 5-24 and 5-25 of the 2015 BPOU annual report were generated and presented according to the description in the text and figure. The model pumping rates for SA1-1 and SA1-3 agree with the values reported in Table 3-6 of the annual report, and the particle tracks were generated for the period from WY2010-11 to WY2014-15. The similarity between the particle tracks for the SA1-1 and SA1-3 wells in the 2014 and 2015 annual reports appears to be attributable to the heavy influence of the extraction rates near the end of the simulation period on the width of the capture zones. This occurs because, although the transient flow fields used for the particle tracking simulations represent a composite of the hydrologic conditions simulated over the duration of the simulation, reduced extraction rates in wells near the end of the simulation period results in particles escaping capture effectively reducing the apparent width of the capture zone. In the case of the particle tracking results for the SA1-1 and SA1-3 wells shown in the 2015 annual report, the reduced extraction rate from SA1-3 in the last year of the simulation and the corresponding increase in extraction rates from SA1-1 results in very similar capture widths. For example, the average extraction rates for SA1-1 and SA1-3 for the last year of this simulation were 1,433 and 1,548 gpm, respectively.** **Note that several changes were made in the way the particle tracks were generated and presented in the 2015 annual report compared with the 2014 annual report. Namely, particle tracking was performed for a five-year period (WY2010-11 thru WY2014-15) rather than a three-year**

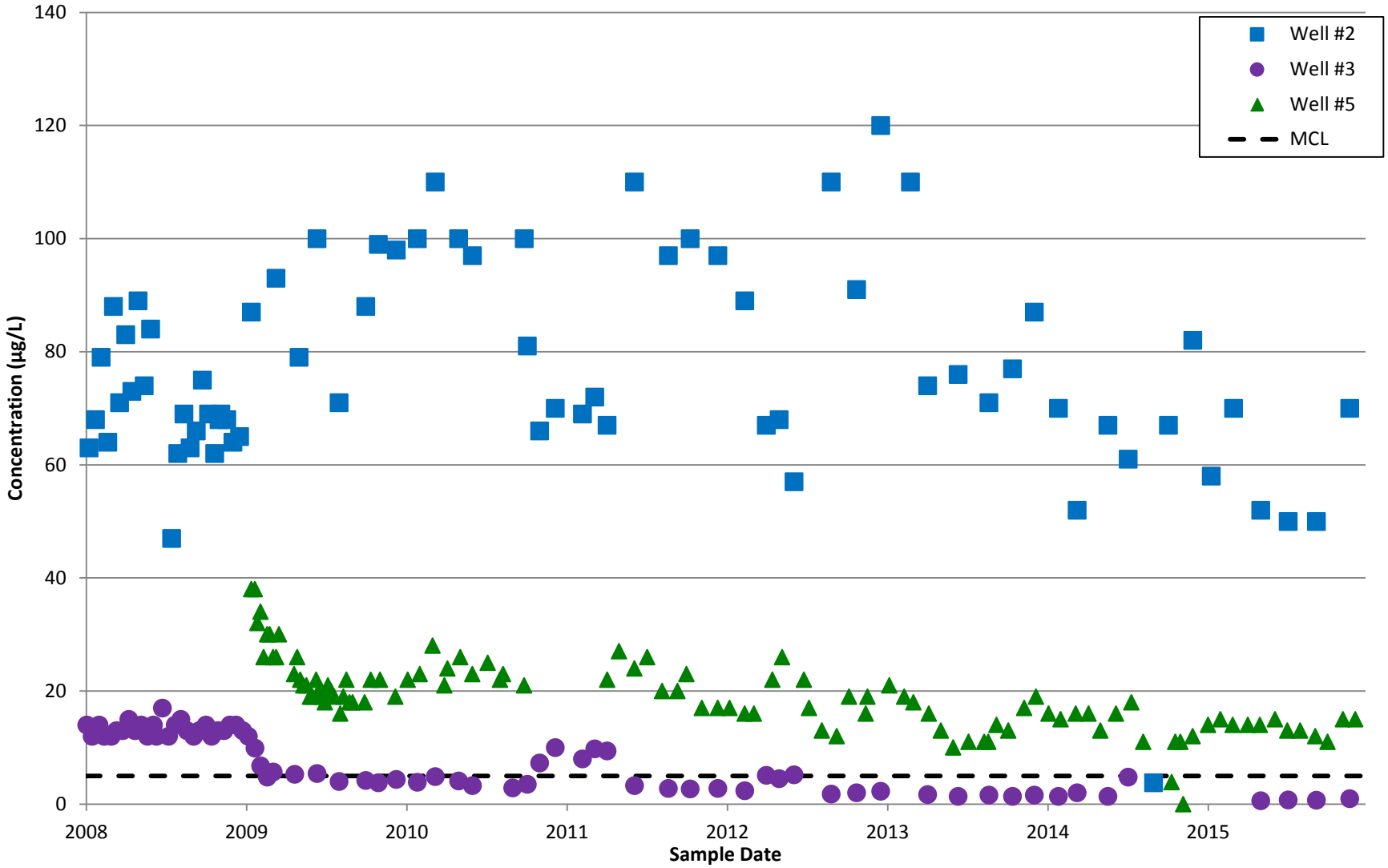
		period (WY2011-12 thru WY2013-14), an effective porosity of 0.15 was used instead of the calibrated specific yield of 0.09, a uniform particle starting distribution was used instead of using model nodes as particle starting locations, the interpreted extent of the plume was updated, and all uncaptured particles were presented in the 2015 figures whereas only uncaptured particles from a single model slice were presented in the 2014 report.
7.	Figure B-14	Table 5-2 and the 2015 monthly reports indicate detectable concentrations of TCE at the LPVCWD plant in 2015 but the figure indicates that TCE was non-detect throughout 2015. Please comment. **Response:** **A revised Figure B-14 is attached showing TCE detections observed in the LPVCWD extraction wells in 2015.**

2015 ETHYLENE DIBROMIDE (EDB) MONITORING RESULTS

Baldwin Park Operable Unit
San Gabriel Valley, California

Well Name	Site ID	Sampling Port	Screened Interval Depth (ft bgs)	Analyte	Sample Collection Date	Analytical Method	Sample Result (µg/L)	Reporting Limit (µg/L)	Detection Limit (µg/L)
MW5-03	BPW503	Port 9	300-310	1,2-Dibromoethane [1]	12/18/2015	504.1	0.02 U	0.02	0.0054
		Port 6	590-600	1,2-Dibromoethane [1]	12/17/2015	504.1	0.02 U	0.02	0.0054
MW5-11	BPW511	Port 2	530 - 540	1,2-Dibromoethane [1]	12/21/2015	504.1	0.02 U	0.02	0.0054
MW5-13	BPW513	Port 2	520 - 530	1,2-Dibromoethane [1]	12/22/2015	504.1	0.02 U	0.02	0.0054
MW5-17	BPW517	Port 2	540 - 550	1,2-Dibromoethane [1]	12/23/2015	504.1	0.02 U	0.02	0.0054
MW5-18	BPW518	Port 3	500 - 510	1,2-Dibromoethane [1]	12/28/2015	504.1	0.02 U	0.02	0.0054
		Port 2	630 - 640	1,2-Dibromoethane [1]	12/28/2015	504.1	0.02 U	0.02	0.0054

U - Analyte not detected at the reported quantitation limit shown in the result.
[1] - Ethylene dibromide is also known as 1,2-dibromoethane



Note: Open symbols signify non-detects.

ERM

TRICHLOROETHENE CONCENTRATIONS, RAW WATER FOR
LA PUENTE VALLEY COUNTY WATER DISTRICT TREATMENT PLANT (2008 - 2015)
Baldwin Park Operable Unit
San Gabriel Valley, California

Project No.
32710118

Figure
B-14