ROCHE/TRC RESPONSE TO
NJDEP COMMENTS (AUGUST 12, 2014 Meeting)
E-MAILED on SEPTEMBER 16, 2014
Ground Water Remedial Investigation Report
(Revision 3, April 2, 2014)

On behalf of Roche, TRC submitted the Ground Water Remedial Investigation Report (GW RIR), Revision 3, on April 2, 2014. The Department provided comments via email to Roche and TRC on May 21, 2014. TRC submitted the Response to Comments Document, July 17, 2014 to address the Department's review of the GW RIR.

Subsequently, NJDEP met with Roche on August 12, 2014 and provided additional comments on September 16, 2014. These comments and Roche's responses are provided below.

General Comments

NJDEP Comment 1:

1. *The Department does not agree with the comments implying that the historic soil and ground water results are not relevant to the RI. While it is agreed that the results from the recent investigations conducted in 2013-2014 delineate the current extent of contamination and are instrumental for the development and implementation of remedial actions, the historic data provides information on, among other things, areas where contaminants were discharged or released, and contaminant attenuation and migration. The limitation of discussion to current conditions negates the historic impacts when Roche was most active (1950s through 1980s) and when numerous construction activities occurred that involved soil reworking and redistribution across the Roche Campus. It is also important to highlight that historic soil and ground water site impact areas have been and are in the process of being remediated; the largest areas have been under remediation since the 1990s.*

   For example, in IA-9 (AOC 49), IA-11 (process sewers) and other PCE source areas, the Department is in agreement that historic detections of PCE in soil compared to recent 2013/2014 sampling has documented that the hot spots or isolated areas of soil contamination are greatly reduced or removed, and in part are no longer acting as sources of ground water contamination. However, the Department disagrees that the historic releases did not move vertically through the soil to the water table. In most areas of the site the depth to water is only 8 to 10 feet below grade, so the PCE release would reach the water table within days and move vertically into the deep bedrock allowing the soil sources to reduce over time, as documented by a comparison of historic and recent site soil sampling results. More information is provided in the Specific Comments below.

Roche/TRC's Response to Comment 1:

We agree that the evaluation of historic data is important in determining where contaminants were or may have been discharged historically and in the development of conceptual site models. TRC has conducted a comprehensive review of historic investigation results, and that background data set has formed the basis of the local (IA-scale) and regional (Site-wide and surrounding areas) conceptual site models developed for the Site, and has guided the design

and implementation of the 2013 and 2014 RI programs and subsequent pre-remedial design investigations (PDIs).

The simplest conceptual site model assumes that locations near or beneath known historic contaminant releases will display the highest soil and groundwater contamination concentrations in the shallowest overburden and aquifer system. Any soil removal or Site reworking within the shallowest overburden might have altered these contaminant conditions in the shallowest saturated overburden but would not have removed the elevated contaminant mass that is sorbed to the fractures and diffused into the matrix of the underlying saturated bedrock. In other words, the highest concentration VOCs observed in groundwater Zones S1, S2 or S3 (whether today or 20 years ago) are indicative of and proximal to the contaminant release areas through this period.

The conceptual site model assists in identifying potential data gaps that need to be addressed and supplemental data collection programs to expand our understanding and characterization of Site conditions and contaminant distribution at this 120-acre Site. The fact remains, however, that these conceptual efforts may not ultimately develop a complete, accurate record of historic releases and offer definitive evidence allowing for absolute definition of contaminant transport and retardation mechanisms within the aquifer media at the micro-scale. Instead, these historic and recent field sampling efforts have yielded investigation findings and lines of evidence that allow RI conclusions to be developed and objectives to be met. The main RI objective has been to collect enough information to allow significant source areas to be identified and the extent of soil and groundwater contamination to be sufficiently delineated to permit remedial design and remedial actions to be undertaken.

We have proposed that this objective has been met by the database presented in the April 2014 Site-Wide Ground Water RIR (and those data presented in other reports prepared for the Site) and that subsequent characterization activities being currently undertaken and documented by Roche will serve to further support the remedial action programs being selected and designed.

Specifically, with regard to IA-9, the NJDEP comment implies that contamination in the immediate vicinity of the release would have been significantly reduced over time and that the current conditions do not represent the true contaminant contribution from this area. It is possible that attenuation has occurred, but scientific principles dictate that if that release migrated from the source to the deeper aquifers at the Site, the concentration profile all along that pathway would attenuate similarly, and not only in select soil source areas. The most logical conclusion from a clean layer below this shallow area is that the source never migrated to the clean layer, rather than a contrary conclusion that it selectively cleaned up through a highly specific attenuation process affecting only the shallow layer.

NJDEP Comment 2:

2. *In response to the DEP request for all deep core hole ground water data since 2003, Attachment 3 (Table 1A and 1B) was submitted with only 2013 data. Clarification is required whether the 2003 installed deep core holes were not sampled until 2013. This would be very unusual considering the expense of installing 20 deep core holes across the site and not collecting any ground water quality data. Based in the information currently available, the Department understands that most of the deep core holes were drilled in 2003, geophysics completed in 2006, and they remained as open borings of 80 to 400 feet below ground surface for a number of years until flute liner installation, abandonment or conversion into monitoring wells. The Department is concerned by the lack of analytical data and the potential that the core holes could have acted as conduits or otherwise affected the migration of contaminants to the deeper bedrock zones. Therefore, all data related to the core hole investigation must be submitted to the Department, pursuant to N.J.A.C. 7:26E-1.5 and 1.6.*

Roche/TRC's Response to Comment 2:

The following table has been prepared to summarize the core hole drilling, geophysical surveys, packer testing, and sealing.

Core Hole ID	Date Installed	Completion Depth (ft) [(1)]	Date Borehole Geophysics Completed [(1)]	Date(s) Packer Testing Completed [(1)]	Date Core Hole Sealed	Remarks
CH-1	Oct-02	650	Jan-03	Jun-03	Aug-14	Converted to nested wells DW-44B and DW-44C
CH-2	Nov-02	650	Jan-03	Jul-03, Feb-13	Mar-13	Converted to well DW-15C
CH-3	Jan-04	450	Mar-04	Oct-04, Mar-13	Apr-13	Converted to well DW-16C
CH-4	Sep-03	503	May-06	Mar-13	Apr-13	Converted to well DW-14C
CH-5	Sep-03	400	May-06	Not Tested	Mar-14	Converted to well DW-40C
CH-6	Oct-03	563	See Notes [(2)]	Aug-13	Oct-13	Converted to well DW-20D
CH-7	Oct-03	500	See Notes [(3)]	Oct-11, Feb-13	Mar-13	Converted to well DW-6D
CH-8	Nov-03	500	May-06	Aug-11, Mar-13	Apr-13	Converted to wel DW-12C
CH-9	Oct-03	425	May-06	Jul-11, Jan-13	Apr-13	Converted to well DW-13D
CH-10	Oct-03	500	May-06	Jul-13	Oct-13	Converted to well DW-21D
CH-11	Aug-09	450	Feb-10	Oct-11, Feb-13	Apr-13	Converted to well DW-8D
CH-12	Aug-09	450	Feb-10	Jul-11, Feb-13	Apr-13	Converted to well DW-2D
CH-13	Oct-09	450	Feb-10	Jul-13	Oct-13	Sealed via tremis grouting
CH-14	Nov-09	450	Feb-10	Not Tested	May-14	Converted to well DW-41C
CH-15	Oct-09	450	Feb-10	Sep-11	Apr-13	Sealed via tremis grouting
CH-16	Sep-09	450	Feb-10	Sep-11	Oct-14	Converted to nested wells DW-50B and DW-50C
CH-17	Sep-09	450	Apr-11	Aug-11	Dec-11	Multi-port FLUTe liner installed
CH-18	Oct-09	450	Feb-10	Oct-11	Apr-13	Sealed via tremis grouting
CH-19	Oct-09	450	Feb-10	Jul-13	Aug-13	Converted to well DW-19D
CH-20	Sep-09	450	Feb-10	Not Tested	Oct-13	Converted to well DW-38C

Notes:
[(1)] When not in use, each core hole location was temporarily sealed with a blank FLUTe liner.
[(2)] Inaccessible in May 2006 due to an obstruction. Logging subsequently completed August 2013.
[(3)] Inaccessible in May 2006 due to construction activities. Logging subsequently completed February 2010.

Between 2002 and 2009, core holes CH-1 to CH-20 (referenced above) were installed to investigate the bedrock conditions at the Site. When not in use, each core hole location was temporarily sealed with a blank FLUTe™ liner. The core holes were never allowed to remain open for extended periods of time, and therefore, could not have served as vertical conduits for

contaminant migration. The primary purpose for the installation of the core holes was to serve as pumping and water level observation points during the two deep aquifer pumping tests conducted (CH-1 and CH-16). Additional tests were performed on selected core holes which included down-hole geophysical logging and packer testing for water quality and transmissivity of fracture intervals, as summarized in the table above. Following each investigation activity (including the two pumping tests), the core holes were sealed using blank FLUTe™ liners, as approved by the NJDEP Case Team at the time[1]. Between December 2011 and October 2014, the status and potential utility of these core holes were reviewed and an action plan was established to either convert the individual core hole to a permanent monitoring well, to be abandoned via tremie grouting (CH-15, CH-18) or to be outfitted with a permanent multi-port FLUTe™ liner installation (CH-17).

NJDEP Comment 3:

3. *TRC/Roche do not believe that the low concentrations of PCE and other contaminants detected in the soil could cause a ground water plume in the 10s to 100s of ppb.*

   The PCE DIGWSSL is 0.005 ppm, so the soil result reported in IA-10 at 3.71 ppm (page 26), expressed as 3,710 ppb, could easily continue to contribute to a ground water plume in the 10s and 100s of ppb.

   Also, the Department maintains that the low levels may be indicative of a historical release of PCE into the soil. The historic release may have moved into the ground water leaving only residual amounts in the soil.

Roche/TRC's Response to Comment 3:

We acknowledge the theory and position presented by the NJDEP. However, the 3.71 ppm in soil is minor in comparison to the DNAPL and significantly elevated VOC concentrations in groundwater that TRC has documented today through hundreds of feet of bedrock in areas upgradient of Roche operations on both sides of Route 3.

As stated earlier, we propose that the current actual database (generated from the array of numerous soil samples and monitoring wells) is sufficient and most relevant to have identified the location of the significant contaminant source areas, and that the extent of contamination has been sufficiently delineated to determine where remedial action is warranted and to support remedial design.. If the NJDEP feels that specific data gaps still persist, Roche requests that the NJDEP identify these so Roche may address them during on-going PDI programs.

Specific Comments

[1] Borehole geophysical survey results have been provided to the NJDEP electronically (via a file sharing web page), and a packer test VOC analytical results summary is attached.

NJDEP Comment 4:

4. *Response to NJDEP Comment No. 6, page 10*

TRC/Roche's response states: "Recent [pre-design investigation] PDI work and examination of the soil data in greater detail indicates that the impacts in IA-11 probably are mostly attributable to the municipal sewers. Additional PDI work in IA-15 is ongoing and will provide more data to assess the relative contribution of process lines (and perhaps practices of Roche's predecessor on IA-15) and municipal sewers that transect this area."

The Department has not yet received the results of the recent and additional PDI work conducted in IA-11 and IA-15 and thus cannot comment on the claim that the contaminants are mostly attributable to the municipal sewers or Roche's predecessor on IA-15. The information must be presented in to the Department in the Annual Groundwater Progress Report or in another report.

However, it must still be noted that IA-15 historically handled, through the site-wide process sewer system, over 1.8 million gallons per day of wastewater that was pre-treated in the Environmental Control Facility (ECF) prior to the permitted discharge to Passaic Valley Sewerage Commission (PVSC). The ECF was brought online in 1982 to provide flow equalization and pH neutralization for pre-treatment of wastewater prior to discharge to the PVSC.

Roche/TRC's Response to Comment 4:

In regard to IA-11 and IA-15 release statements, we acknowledge (without agreeing to) the position presented by the NJDEP. The Groundwater Progress Report will provide a summary of PDI activities conducted in IA-11 and IA-15. Preparation of reports that document the field activities and findings is underway and if possible, these finalized PDI reports (for IA-11 and IA-15) will be included as appendices in the progress report.

NJDEP Comment 5:

5. *Response to NJDEP Comment No. 7, IA-3, page 15*

TRC states, there were numerous process lines in the eastern part of IA-3, and other portions of the facility, but the only locations where chlorinated VOC contamination is prevalent in IA-12, IA-3, IA-7 and IA-11 is where the process lines are co-located with the current or former alignment of the Clifton-Allwood Municipal Sewer.

The TRC conceptual model, that the Clifton-Allwood Municipal Sewer is a major contaminant source, must consider that the sewer line was installed within the natural drainage corridor running from north to south through the center of the site and corresponding with the area of

heavily fractured bedrock (numerous vertical fracture and mapped fault line), and would, therefore, be the regional collection point for most surface runoff and ground water flow within and outside of the area of the sewer line, as well as any discharges at the site. This overall drainage is well defined by the ground water elevation contours of all shallow and deep bedrock zones, and indicates that the ground water in the western part of the Roche Campus flows predominantly easterly toward the heavily fractured and highly transmissive zones located in the center of the site.

Further, the major ground water capture zone of Roche's production wells PW-33 and PW-20 lies within in IA3 and IA-7. Production well PW-33 and PW-20 operated through the mid-1980s with operations reportedly terminated due to the chlorinated VOCs that were captured at that time from as yet unidentified sources.

Roche/TRC's Response to Comment 5:

We acknowledge (without agreeing to) the position presented by the NJDEP and anticipate that supplemental data collected will refine, expand and clarify the current understanding of the conditions in this area. The Groundwater Progress Report will provide a summary of PDI activities recently conducted in IA-3/IA-7/Clifton-Allwood Municipal Sewer (CAMS) and include the finalized PDI report as an appendix in the progress report.

NJDEP Comment 6:

6. *Response to NJDEP Comment No. 7, IA-9, page 21*

TRC/Roche's response states that the potential DNAPL transport mechanism that was expressed in the Department's comment is not supported by actual Site data.

The Department disagrees with this statement as discussed below.

NJDEP Comment 6a:

a) Based on general PCE usage at the site, it is accepted that the period of highest use and potential release most likely occurred over 20 years ago, and once released PCE moves quickly vertically to the water table due to its density. The PCE will disperse across the water table and, if released in large enough volumes, will remain as DNAPL and adsorb into hair line fracture of the native clay (reported in 2013 soil and ground water data). The amount of PCE that remains in the unsaturated soil zone will be dependent on release amounts, soil type and adsorption and absorption of the materials, which at the Roche site range from bedding sand material to weather bedrock silt/sand/clay and fractured rock.

Roche/TRC's Response to Comment 6a:

We acknowledge (without agreeing to) the general statement made by the NJDEP. The data collected to date indicate that the highest VOC concentrations observed in soil and/or groundwater (shallow or deep) are in close proximity to the contaminant release areas. This will be apparent after review of the supplemental data you will receive in the immediate future.

NJDEP Comment 6b:

b) The PCE releases in IA-9 occurred at locations with greater than 5 feet thicknesses of clay overlying the top of bedrock, at the approximate depth of the water table, and constricted between Building No. 42 to the north and Building No. 73 to the south. The clay could ordinarily act as a confining layer for vertical migration of contaminants; however, during construction of Buildings Nos. 42 and 73 in the 1940s and 1960s, respectively, the building foundations penetrated and removed some of the lateral extent of the clay "confining layer."

Roche/TRC's Response to Comment 6b:

We acknowledge (without agreeing to) the theoretical possibility of the scenario presented by the NJDEP, but the data do not support it. In fact, the soil and groundwater quality data for IA-9 that were provided in the previous response to NJDEP comments indicate that the soil and groundwater contamination in this area is limited, has been completely delineated, and the delineation is adequate to support remedial design activities. If the NJDEP has identified specific data gaps, we request that the NJDEP notify Roche so they may be addressed during future PDI and remedial programs.

NJDEP Comment 6c:

c) The PCE releases in IA-9 occurred at the process waste sewer and so would be expected to follow preferential flow pathways along the process sewer and/or the numerous other subsurface features identified during the July 2014 excavation of the area. The process sewers have been documented in the RI to drain toward the heavily fractured and highly transmissive zones located in the center of the site. The soil results at AOC 49 indicate that a preferred pathway would have been to the north in the direction of soil cluster B732.

Roche/TRC's Response to Comment 6c:

See response to b) above. In addition, the Groundwater Progress Report will provide a summary of PDI activities conducted in IA-9 and include the finalized PDI report as an appendix. Regarding the reference to soil boring B732, please note that the deepest soil collected from the B372 series is 5.5 feet below ground surface (bgs) and the water table

interface is between 10 and 12 feet bgs. There are no dissolved CVOCs in Zone S1 groundwater in the area of the B732 soil borings.

NJDEP Comment 6d):

d) When active, the Roche production wells PW-33 and PW-20, located to the east of IA-9, would have drawn down and captured the PCE releases, resulting in Roche's decision to terminate operations of both wells sometime around 1987 due to contamination. At that time, the ground water results from both wells indicated dissolved PCE concentrations greater than 0.5 mg/L (500 ug/L), results which continue to be recorded in the surrounding monitoring wells.

Roche/TRC's Response to Comment 6d:

The groundwater quality data for IA-9 (that were provided in the previous response to NJDEP comments, and to be included in the IA-9 PDI report) indicate that the groundwater contamination in this area has been completely delineated and the CVOC plume in IA-9 does not extend to these production wells. There is no current evidence (provided by the extensive existing data set) to indicate that impacts identified in IA-9 have contributed to the CVOC plume in the area of PW-20 and PW-33. Given their close proximity to the CAMS, the NAPL, and significantly elevated concentrations through all bedrock layers in the northern end of that sewer, it seems far more probable, from a scientific evidence perspective, that the CVOC contamination found in these wells is attributable to the CVOC plume emanating from the northern end of the CAMS. Again, if the NJDEP has identified specific data gaps in IA-9, we request that the NJDEP notify Roche so they may address these during future PDI programs.

NJDEP Comment 6e:

e) Data from deep core hole CH-10 and monitoring well MW-21D screened at 445 feet bgs in Zone D-3 (converted from CH-10) indicate the "trail" effect of the DNAPL release from AOC-49, which migrated vertically to over 400 feet bgs. In addition, the May 27, 2006 geophysical work at CH-10 indicates strong downward vertical ground water flow at approximately 0.5 gallon per minute in the zone from 150 to 200 feet bgs. This is consistent with the upper S-1, S-2, S-3 zones which all drain downward into the lower deep bedrock.

Roche/TRC's Response to Comment 6e:

See response to b) and d) above. The groundwater impacts from IA-9 have been completely delineated, and do not extend into the deep bedrock. The source of CVOCs detected in packer samples from CH-10 is likely located upgradient of CH-10.

NJDEP Comment 6f:

f) The shallow bedrock was being dewatered by sumps in each of the buildings reportedly operating, as needed, at pumping rates between 20 to 40 gpm. This pumping may have captured and removed some of the contaminated ground water resulting in breaks in the trail effect.

Roche/TRC's Response to Comment 6f:

See responses to comments 6b and 6d above.

NJDEP Comment 7:

7. *Response to NJDEP Comment No. 7, IA-9, page 22*

TRC/Roche contends that IA-9 is not a source of ground water contamination, since nowhere on the Site has a high concentration VOC plume separated from the source and migrated a considerable lateral or vertical distance without leaving a continuous trail of elevated VOC concentrations.

The Department believes this conceptual model of a "trail" of contamination from the source release would occur under ideal conditions, including a recent VOC release, ongoing discharge, constant flow direction over the duration of the release and discharge within the same stratigraphic unit. All of these conditions have partially existed historically in IA-9 (and also in IA-11). In addition, the June 2013 data from deep core hole CH-10 (presented in Appendix 3 of the RTC) show that the "trail effect" does exist below IA-9. The PCE concentrations in the CH-10 packer test samples ranged from 283 ug/l to 416 ug/l across the 151 to 360 feet bgs intervals. Also, the 2013/2014 data from MW-21D, screened at 445 feet bgs in Zone D-3 (converted from CH-10), defines the near bottom of the PCE plume with concentration range from 40 to 90 ug/l.

The forthcoming Annual Groundwater Progress Report must discuss this "new" information from bedrock zones D1, D2 and D3 zones at deep borehole CH-10 and include updates to the site plume maps.

Roche/TRC's Response to Comment 7:

See responses to comments 6b and 6d above.

NJDEP Comment 8:

8. *Response to NJDEP Comment No. 7, IA-9, page 23*

The TRC/Roche statement that there is no known mechanism by which the pumping of the production wells would have selectively drawn PCE downward and not induced the migration of toluene, chloroform, benzene, and methylene chloride, all of which are more soluble than PCE.

This is a simplified conclusion. The timeframe, volume of the release, water table cyclic depression, natural attenuation of BTEX compounds, and LNAPL versus DNAPL migration with depth, together with the present day DNAPL concentrations are more important than the solubility values. The Department does not agree with TRC/Roche statement in support of their conceptual model that isolated DNAPL occurrence has not contributed at all to the chlorinated VOC plumes delineated in Zones S1 and S2. The ground water data clearly defines the PCE plumes in deeper zones at deep core hole CH-10 and TRC/Roche has not accounted for important factors with respect to field investigations at NAPL spill sites including the manner in which NAPL was introduced into the subsurface and the properties of fluid and porous media.

Roche/TRC's Response to Comment 8:

See responses to comments 6d and 6e above.

NJDEP Comment 9:

9. *Response to NJDEP Comment No. 7, IA-11, page 27*

TRC states that videotapes of the municipal sewers indicate the presence of numerous cracks and breaches occurring in IA-11 and IA-15, similar to the condition of the sewers further north and west (i.e., IA-12). As such, while the impacts in IA-11 and IA-15 may have received some contribution from Roche process lines and other operational activities, a significant portion of the VOC mass detected in ground water in these areas is likely attributable to release from the municipal sewers.

The Department has not yet received any of the above information on the municipal sewers in the area of IA-11 and IA-15 to comment on what the major contributor to soil and ground water contamination beneath the Roche site is, or, if such a clear distinction in a comingled plume will even be possible after years of removal actions and IRMs at the site. The information must be presented in to the Department in the Annual Groundwater Progress Report or in another report.

Roche/TRC's Response to Comment 9:

We acknowledge the position presented by the NJDEP. The Groundwater Progress Report will provide a summary of PDI activities conducted in IA-11 and IA-15 and if possible, include

the finalized PDI reports as appendices. Please note that Appendix S of the April 2014 Site-Wide Ground Water RIR included the Paulus, Sokolowski, and Sartor (PS&S) Municipal Sewer Inspection Report (which documents the compromised structural integrity of the sewer line).

NJDEP Comment 10:

10. *Response to NJDEP Comment No. 7, IA-11, page 28*

The TRC reference that concentrations of DNAPL chemicals in soil greater than one percent by mass or 100,000 mg/kg to indicate DNAPL shall be corrected to reference the Department guidance of Chemical Properties, which for PCE used the impact to ground water soil saturation limit of 111 mg/kg. The EPA guidance on Table 5 of the EPA/540/F-94/049 September 1994 publication was a recopy of information from other authors during 1991, 1992, and 1993 which has been updated based on chemical and soil properties (e.g. EPA Soil Screening Guidance User's Guide 9355.4-23 July 1996, p28). The DEP guidance for DNAPL in soil is based on the May 2014, Using the Combined SESOIL/AT123d Models to Develop Site-Specific Impact to Ground Water Soil Remediation Standards For Mobile Contaminants Table 1, 2008 New Jersey DEP Remediation Standards Chemical Properties and Soil Saturation Limits.

The Department believes that DNAPL may have been present in IA-11, but full vertical delineation was never completed in the Site Investigation (SI) prior to the startup of the IA-11 IRM in 2006.

Roche/TRC's Response to Comment 10:

We acknowledge (without agreeing to) the position presented by the NJDEP. Based on the current Site database, there is no scientific evidence that DNAPL historically was present in IA-11.

NJDEP Comment 11:

11. *Response to NJDEP Comment No. 7, IA-12, page 30 and*

TRC states that Roche does not view the low PCE concentration of 3.12 ppm in a soil sample collected directly under the sewer as the source of the high PCE concentrations in groundwater. It is stated that the cause of the high ground water PCE concentrations is DNAPL that has migrated out of the sewer and into the fractures penetrating to a depth of a least 41 feet bgs.

The Department has not reviewed an explanation of how the DNAPL from the sewer is documented to have entered the bedrock is unrelated to the 3.12 ppm PCE soil sample, and how this is different than other areas of the site where soil PCE concentrations were much greater than 3.12 ppm.

Roche/TRC's Response to Comment 11:

For clarification, the detection of 3.12 ppm of PCE in a soil sample (collected directly under the sanitary sewer) is indicative of historic releases from the municipal sewer and such historic sewer releases have resulted in the presence of DNAPL being detected in bedrock fractures at depths of up to 41 feet bgs. These historic releases (in this area) have contributed to the CVOC plume conditions documented in underlying aquifer zones. While the presence of 3.12 ppm of PCE detected immediately below the sewer is minimal in comparison to the DNAPL, both were cause by PCE releases from the sewer.

NJDEP Comment 12:

12. *Response to NJDEP Comment No. 7, IA-15, page 32*

Clarification is required on the source area in IA-12, since TRC/Roche does not view 3.12 ppm of PCE in soil as a "source" that would create a ground water plume with 100s of ppb PCE when the May 2014 public notice for the IA-12 IRM presentation focused on the immediate area of the 3 ppm PCE concentration soil sample, which corresponds with DNAPL levels in ground water and proposed remove/reduce the DNAPL source within the top 68 feet (delineated extent of DNAPL) from its release (zones S-1 and S-2). In addition, data from IA-12 RI shown that S-1 and S-2 monitoring wells placed as little as 10 feet away from a "DNAPL" concentrated monitoring well are order of magnitude lower in concentrations, which needs to accounted for other site locations where the monitoring wells location are over 40 feet from documented historic releases.

Roche/TRC's Response to Comment 12:

See response to comment 11 above.

NJDEP Comment 13:

13. *Response to NJDEP Comment No. 3 (following May 21, 2104 meeting), page 41*

Based on TRC/Roche's interpretation of ground water flow conditions in this area, there is no primary component of flow to the northeast from the Site.

However, as previously stated, based on data presented in the GW RIR, ground water flow in deep zone D1, D2 and D3 indicated strong eastern flow parallel with Route 3, and this northern portion of the site may have a northeast component which reportedly is still being evaluated with concern for the potential impact of the receptor Ridgelawn Cemetery irrigation and non-public active wells (G-4 and NP1). The Department will review the water level and water quality data in the forthcoming Annual GW Progress Report due in October 2014.

Roche/TRC's Response to Comment 13:

We acknowledge (without agreeing to) the position presented by the NJDEP.